GAME MANUAL

MATRIX

BK wargames

CONTENTS

SYSTEM REQUIREMENTS

MINIMUM SPEC

OS: Windows 7 or better
Processor: - Pentium 4 or better
Ram – 1GB
Hard Disc space - 400 MB uncompressed
Sound Card - DirectX Compatible sound card
Graphics Card – 512 MB DirectX9 Compatible Graphics Card

Desert War also requires Java -1.7 or better to be installed

Please ensure your graphics and sound drivers are up to date before playing the game or you may experience graphical glitches or more serious errors. Check your manufacturer's website for the latest version, as new drivers are released regularly.

INSTALLING THE GAME

Please ensure your system meets the minimum requirements listed above. If you purchased from the Slitherine or Matrix site you will have been provided a download link for the games installer. To install the game, either double click on the installation file you downloaded or if you have the boxed version, insert the *Desert War 1940–42* DVD into your DVD-ROM drive. If you have disabled the autorun function on your DVD-ROM. Follow all on-screen prompts to complete installation.

If you have redeemed a Steam key or purchased via Steam you can also launch the game on Steam.

UNINSTALLING THE GAME

Please use the Add/Remove Programs option from the Windows Control Panel or the Uninstall shortcut in the games Windows “Start” menu folder to uninstall the game. Uninstalling through any other method will not properly uninstall the game.

PRODUCT UPDATE

In order to maintain our product excellence, Slitherine releases updates containing new features, enhancements, and corrections to any known issues. All our updates are available free on our website (www.slitherine.com) and can also be downloaded quickly and easily by clicking on the “Update” link in your Game Menu or by using the “Update Game” shortcut in your Windows “Start” menu folder for the game. If you have the Steam version, Steam will update it according to your settings.

MULTIPLAYER REGISTRATION

If you bought the game directly from us, we highly recommend registering your game first before playing. You can simply do this through the game menu, from Multiplayer or directly at Slitherine’s website at:

www.slitherine.com/sign up

This is because you will need a registered account to play Multiplayer games on Slitherine`s PBEM (play by e-mail) server.

When registering you can choose to sign up to the newsletters to receive regular updates, offers and discounts on the rest of Slitherine's catalogue so it is worth registering!

Steam users cannot currently register though are able to play multiplayer

GAME FORUMS

Our forums are one of the best things about Slitherine. Every game has its own forum with our designers, developers and the gamers playing the game. If you are experiencing a problem, have a question or just an idea on how to make the game better, post a message there.

Go to www.slitherine.com and click on the Forums hyperlink.

NEED HELP?

The best way to contact us if you are having a problem with one of our games is through our Help Desk. Our Help Desk has a FAQs section as well as a dedicated support staff that answer questions within 24 hours, Monday through Friday. Support questions sent in on Saturday and Sunday may wait 48 hours for a reply. You can get to our Help Desk by going to http://www.matrixgames.com/helpdesk

INTRODUCTION

"Of all theatres of operations, it was probably in North Africa that the war took on its most advanced form. The protagonists on both sides were fully motorized formations, for whose employment the flat and obstruction-free desert offered hitherto undreamed-of possibilities. It was the only theatre where the principles of motorized and tank warfare, as they had been taught theoretically before the war, could be applied to the full – and further developed. It was the only theatre where the pure tank battle between major formations was fought."

– Field Marshall Erwin Rommel

Desert War 1940–42 is an operational level, ground-centric wargame that recreates the epic tank battles fought between the Axis and Allies for possession of North Africa during WWII. It consists of a series of brief, historical and "What-if" scenarios that allow the players to explore the ebb and flow of the actual conflict. The scenario list begins with the Italian Invasion of Egypt in the summer of 1940 and ends with the turning point of the Desert War at El Alamein.

The game uses stylized maps of portions of North Africa over which a hexagonal grid system has been superimposed. This grid is employed to help regulate unit placement, movement, and combat. Ground, air, and sea forces can also be brought to bear during play. Ground units range in size from platoons to battalions and are represented on the map using icons. Air, Naval, and Ground Assets are off-map capabilities that can be brought into play when the owning player sees fit. Generally speaking, air assets represent squadrons (9-24 aircraft) that are capable of conducting counter-air, interdiction, ground attack and ground support missions. Air reconnaissance (recce) assets represent flights of two to four aircraft. Air recce assets are capable of collecting information about the location and type of enemy ground units on the map. Naval Assets represent individual ships able to provide of ground attack and ground support missions. Lastly, there are off-map Ground Assets that provide additional capabilities that can influence the on-map battle. Ground Assets include electronic warfare assets, command and control (C2) activities, and Special Forces.

In many board and computer wargames, one side will move its units and resolve combat, followed by the other side repeating the process. This game mechanic is known as IGOUGO ("I GO YOU GO"). *Desert War 1940–42* is different – it is a WEGO computer wargame. WEGO by its nature is about the Player's ability to plan for and manage chaos; to find solutions to perceived challenges to accomplishing the mission with the tools at hand. Despite the fog of war... against a thinking opponent who must problem-solve and plan under the same conditions.

STARTING *DESERT WAR*

On launching the *Desert War 1940–1942* program, the player will be presented the game's Main Menu. There are seven menu items to choose from:

- **Play Introductory Scenario** This starts the introductory Bardia scenario against the Axis AI.
- **Play** Select this item if you wish to play a new scenario.
- **Editor** This button will launch the game editor program.
- **Options** This displays the game options.
- **Credits** Acknowledgments of those individuals who have provided substantive effort and/or input for the development and production of *Desert War 1940–42*.
- **Exit** Exit the game and return to computer desktop.

START / RESUME GAME

Select **Play** from the Main Menu to start.

You can then choose whether to start or resume a game one of the following types of game:

- **HotSeat** game against a person on the same computer.
- **Computer Opponent** game against the AI
- **Multiplayer** game against someone over the internet using Slitherine's PBEM++ server.

When New Game is selected, you can then choose your side, the game scenario, and whether you want to play with Fog Of War on.

Press on **Create** to start the game.

COMPUTER OPPONENT

For the Computer Opponent, there are two more options.

AI Bonus

Here you can choose to give the AI a bonus.

+ bonus means that the AI has unlimited supplies and is not affected by Fog Of War. Therefore, if Fog Of War is on, you will not be able to see the AI's units, but the AI will be able to see your units.

- bonus means that the AI starts with no supplies and receives no supplies.

Neither type of AI bonus influences combat results.

AI vs AI

You can also select an option to let the AI play against itself.

Normally, the AI vs AI game will show the film after each turn, but if you select **Skip film in AI vs AI game** in the Main Screen's **Options**, the game will play all the way to the end and only then show the final film.

MULTIPLAYER TABS

To play multiplayer, you must be registered with the Slitherine PBEM++ server.

If you already have an account, just login. Otherwise press the **Register** Tab and register your new account.

Once logged in, there are three options:

Games – shows your current ongoing game

Issue – shows the *challenges* you have issued, but that have not been accepted by an opponent. Once an opponent accepts a *challenge*, the game will be listed **Game**'s Tab. Use **Create** to issue a new *challenge*.

Accept – shows the *challenges* that other players have issued. Once you **Accept** an opponent's *challenge*, the game will be listed in the **Game**'s Tab.

MULTIPLAYER EMAILS

You will receive the following email notifications:

- **Challenge Started** – sent when a *challenge* has been accepted by your opponent.

- **Turn Update** – sent when your opponent has taken his or her turn.
- **Game Over** – sent when the game is over.

MULTIPLAYER GAME OPTIONS

When creating a new game there are three Multiplayer game options as list below. These options correspond to the three icons that will be show in the **Accept** tab.

? Fog Of War – game will be played with Fog Of War on. If this is not present in the **Accept** Tab, then there is no Fog Of War.

 Paired – a paired game means that there are two games created, one in which you play the allies, and one in which you play the Axis, but which use the same scenario.

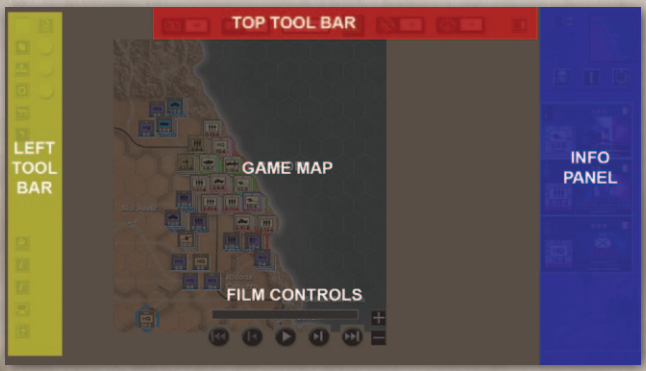
 Password – creates a game that someone can only accept if they know the password that was entered when the game was created.
Use this option if you want to play against a specific person and then send that person the password. Only that person will be able to accept the game.

OPTIONS SCREEN

- **Toggle map auto-scroll**. Check this box to have game auto-scroll; when selected the cursor will cause the map to move left, right, up or down when moved to the edge of the play area. Use **Hotkey-X** to change this in-game.

- **Full Screen (vs window play)**. Check this box to play in Full Screen mode. Uncheck to play in Windows mode.
- **Show "Confirm Supply" dialog**. Check this box to show a confirm supply changes dialog when exiting the Supply window after changing a HQ's supply level.
- **Show current Phase dialog**. Check this box to show the phase when entering a new phase.
- **Show "Proceed to next turn" dialog**. Check this box to show a dialog box before proceeding to next turn.
- **Skip film in AI vs AI game**. Check this box to play an AI vs AI game all the way until the end without pausing each turn to view the film. This AI vs AI game will only stop running when it reaches the Victory Phase. WARNING: depending on the size of the scenario, it may take some time for the AI to finish the game.

MAIN GAME SCREEN



The main game screen is where the bulk of the game activity will take place. It consists of five areas: Top Tool Bar, Left Tool Bar, Info Panel, Film Controls and the Game Map.

CURSORS

The game cursor may change to reflect the actions that can be taken on / with a unit.

A friendly unit is under the cursor and can (usually) be moved.

A friendly ground unit has been selected and can be dragged to its destination.

The selected destination hex for this unit is invalid.

Naval / air / artillery attack missions can be ordered on enemy units.

Defensive naval / air / artillery missions can be ordered on friendly units.

A Recon (reconnaissance) mission can be ordered against this hex.

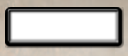
A friendly unit is being dragged and if it is dropped, it will execute a ‘Set-Piece’ attack against this hex. See Combat chapter for the difference between ‘Set-Piece’ and ‘Adhoc’ attacks

TOP TOOL BAR

The top tool bar contains five information boxes and two action buttons. If you hover your cursor over each box a tooltip will pop-up display.

Fuel Available. This display shows the amount of fuel points remaining for the Phasing Player.

Ammo Available. This display shows the amount of ammo points remaining for the Phasing Player.



Current Phase. This display shows the current game phase.

Next Phase. This button concludes the Planning Phase for a player's side. Select this button ONLY if you have completed planning all ground, air, and naval operations for your side. This will pass control of the game to your human or AI opponent. Once pressed, you can't go back.

Counter-air Allocation. This display shows the current number of Air Assets dedicated to the Counter-air mission by the Phasing Player.

Interdiction Allocation. This display shows the current number of Air Assets dedicated to the Interdiction mission by the Phasing Player.

Right Info Panel Toggle. Turn the right info panel on/off.

MAP BUTTONS

Set Move Type (Hotkey-M). This button cycles through the three movement modes:

- **Move and Defend.** Units will move and stop if they encounter enemy units. They will attempt to

overrun if they have the odds but will not attack.

- **Move and Attack.** Units will move and attack any enemy unit blocking its path to its destination hex. They will attempt to overrun before they attack.
- **Road Movement.** Units must have Move+ supply to use Road Movement. Units use the low road movement rate but are subject to ambush if they move adjacent to enemy units.

NOTE: Pressing the **Alt**-key and dragging a unit or stack will plot a move that ignores the presence of enemy units or their Zones Of Control. This is useful to get units forward if you believe the enemy is about to withdraw from a hex.

Set Supply Levels. There are three levels of supply: **Basic**, **Move+**, and **Combat+**. All HQs automatically default to **Basic** Supply Level at the start of each planning phase. Change the supply levels for selected HQs by selecting the Supply button on the top left portion of the game screen. Select **Move+**, **Combat+**, or both. Changing supply levels to **Move+** and / or **Combat+** cost fuel and/or ammo points.

View Side Hierarchy. Pressing this button displays an organizational chart of the HQs and subordinate units of a player side.

Pressing a HQ in this display will center the map on that HQ.

Undo All Orders. Undo all the orders issued to the last selected unit. This removes all a units moves or completely removes a battle. To undo the orders of a specific unit or a specific battle, move the cursor over the unit or battle and press **Hotkey-U**.

Undo One Order. Undo one order issued to the last selected unit. E.g. undo one move of a multiple hex move order. Or remove one unit from a battle. To undo a single order of a specific unit, move the cursor over the unit and press **Hotkey-BACKSPACE**.

Show Units At Start/End. Toggle units to their starting or planned destination locations.

Show Hex Contents buttons. Click to open / collapse the buttons below.

Toggle Armies. Adds removes all armies from the map.

Show HQs. Removes all units except for HQs, which will be placed at the top of each stack.

Show Unmoved Units. Units that have moved will be semi-transparent.

Toggle NATO / unit pics. Show unit pictures or NATO symbols on the map counters (**Hotkey-N**).

Hotkeys. View a complete list of hotkeys available in-game.

Information Button #1. Click to open / collapse the buttons below.

View Scenario Briefing. Press this button to review the scenario description, player missions, etc.

View Quick Start Guide. Press this button to open the Quick Start Guide .pdf file.

Show Statistics. Press this button to view current game statistics. The statistics that are being tracked are Victory Points, Ammo consumption and Fuel consumption over time. The end film will compare all of these factors for both sides.

Information Button #2. Click this button to open/ collapse the buttons below.

View Anti-aircraft CRT. Select this button to view the Anti-aircraft Combat Results Table.

View Ground CRT. Select this button to view the Ground Combat Results Table.

View Terrain Effects Chart. Select this button to view the Terrain Effects Chart.

Open Sound Options.

Set Display Options. Selecting this button will allow the player to select what top of unit will be placed at the top of a stack, set the various map and hex

overlays, set the various unit border colors, or set the various army display options.

Exit / Save Game. Select this button to save the current game, or exit the game.

View Air Results / Reinforcements / Withdrawals. Game status shows the results of counter-air and interdictions missions; it also shows the arrival of reinforcements and departure turn of withdrawing units and assets.

Allocate Air Assets. If this button has a red ring, it means you still have air assets available for tasking. If it is green, it means you have tasked all of your air assets. Click on this button to view the air assets panel. Click it again to close it.

Allocate Naval Assets. If this button has a red ring, it means you still have naval assets available for tasking. If it is green, it means you have tasked all of your naval assets. Click on this button to view the naval assets panel. Click it again to close it.

Allocate Ground Assets. If this button has a red ring, it means you have still ground assets available for tasking. If it is green, it means you have tasked all of your ground assets. Click on this button to view the ground assets panel. Click it again to close it.

Next Phase. This button ends the current phase. If in the Execution Phase, then the Planning Phase will start. If in any other Phase, then the current players turn will end.

INFORMATION PANEL

OVERVIEW PANEL

This panel displays the current turn and time and date of the scenario. It also includes a small jump map. Clicking on the jump map will center the main map on the selected position.

Display Victory Data.
This panel shows points awarded to both sides for destroying enemy units and/or occupying Victory Point locations. Clicking on a victory location on the right hand pane will center the map on that location.
Clicking this button will also add victory location markers to the map.
In this mode, victory location pop ups will also appear when the cursor is over a victory location.

Cycle Attack/Defense Orders.
This button changes the defensive orders for all units in a hex, or the offensive orders for a battle.
To use this button, press **Hotkey-F** (or double click) when the cursor is over the units whose orders you wish to change. Pressing **Hotkey-O** also changes the orders.
Ground Unit Attack Orders. Attack order assignments apply to *all* attacking units; you cannot assign different orders to different attacking units or different attacking stacks.

 Assault, increases battle intensity

 Attack, normal intensity

 Attack, no advance

Ground Unit Defense Orders. Defense order assignments apply to *all* units in the hex; you cannot assign different orders to different units in a hex.

 Hold (normal defense)

 Hold at all costs (take casualties instead of retreating). Higher quality units and/or units with good readiness have a greater chance of holding.

 Withdraw instead of taking casualties. Higher quality units and/or units with good readiness have a greater chance of withdrawing successfully.

Cycle Stacking Order. Pressing this button will change the stacking order of the hex. To use it, first press **Hotkey-F** when the cursor is over a hex. Then press this button to move the unit at the bottom of the stack to the top. This is the same as pressing Hotkey-C when the cursor is over a stack.
You can also move a unit to the top of the stack by left clicking its counter.

UNIT DETAILS AREA

This displays information about the units in the hex under cursor.

Each ground unit has its own panel that displays current status and various unit attributes. This section displays all the unit panels contained in a single hex.

To see what the icons on the display mean, press **Hotkey-F** to select a stack of units, and then move the cursor over the icons to see the tool tips.

After **Hotkey-F** is pressed, left clicking on a unit's picture will select or deselect that unit. This allows the player to move or attack with only a portion of a stack.

Right clicking on the Unit Details will display more information about the unit in the same way as right clicking on the unit counter on the map.

VICTORY DETAILS PANEL

When this display is open, the victory hexes are highlighted on the map. Moving the cursor over a victory hex will display a victory details pop up.

At the top, the total victory points are shown.

Beside the skulls, the victory points for destroying enemy units is shown.

Then a list of all the victory locations is shown, with the points obtained by each side for controlling this location.

Pressing one the victory location names will center the map on that location.

Total Received. When this is selected, the numbers are the total victory points each side has received for that location during the game.

Max Per Turn. When this is selected, the numbers are victory points each side would received for occupying that location.

GAME MAP

- Left clicking on a hex will center the map on that hex. Move the cursor to the edge of the map to scroll in that direction. Or use the Arrow keys to move the map left, right, up or down or move the cursor in the direction you want the map to scroll.
- Right clicking on a unit, hex, or battle will display detailed information on that unit, hex, or battle.
- The currently selected map center is the hex with a yellow border.
- Depending on the map size, there are several map zoom levels. Scroll the mouse wheel to the rear to zoom out from the map; scroll the mouse wheel forward to zoom in. As an alternative use the + or – keys.
- A unit can be dragged with the left mouse button. A stack of units can be dragged also; place the cursor over the stack, double click or press **HotKey-F** and then drag the stack to its destination hex with the left mouse button (see Moving Units).

HEX DETAILS POPUP

Use **Hotkey-K** to turn on/off the Hex Details popup. This pane will open after the cursor is left over a hex for a few seconds.

NOTE: This pane will not display if the Victory Details Panel is open.

This panel displays the following information about units in the currently selected hex:

This pane displays the hex coordinates and then data for the Axis : Allies. This hex data includes:

- The anti-aircraft (AA) values. Heavy AA units can affect adjacent hexes.
- The stacking points of the units in this hex (and the max stacking allowed).
- The ZOC values.
- The average quality of the hex's units.
- The effective Attack and effective Defense values
- The Attack and Defense Shock values

See Shock for more information on the Shock Value.

UNIT STACKING POPUP

Press **Hotkey-T** to turn on the unit popups. Repeatedly pressing **Hotkey-T** will loop through the types of popups.

This is the same as unit details on the Info panel.

This shows the contents of a stack. The unit currently under the cursor is enlarged.

MAP ICONS

There are two sets of map icons used to assist the player during game play; one is a set for the Planning Phase and the other, a set for the Execution Phase.

PLANNING PHASE MAP ICONS

The following icons are used on the game map during the Planning Phase to assist the player in seeing/understanding his current plan:

Indicates an artillery unit has been ordered to fire a Ground Support or Ground Attack mission.

Indicates the currently selected artillery unit has been ordered to fire a Ground Support or Ground Attack mission.

Indicates that a Ground Attack mission has been planned on the enemy ground units in the hex indicated.

Indicates that a Ground Attack mission has been planned on enemy ground units by the currently selected artillery unit.

Represents a planned Naval Attack mission on enemy ground units in the hex indicated.

Represents a planned Naval Attack mission on enemy units in the hex indicated by the currently selected naval asset.

Represents a planned Ground Support or Ground Attack air mission on enemy ground units in the hex indicated.

Represents a planned Ground Support or Ground Attack air mission on enemy ground units by the currently selected air asset.

Indicates that a Defensive Ground Support air mission has been planned in this hex.

Indicates that a Defensive Ground Support air mission has been planned in the indicated hex for the currently selected air asset.

Indicates that an Air Reconnaissance or Electronic Warfare mission has been planned for this hex

Indicates than a Air Reconnaissance or Electronic Warfare mission has been planned for this hex by the currently selected unit.

Indicates an Attack on enemy units in this hex.

Indicates an Attack on enemy units in this hex by the currently selected unit.

Indicates that an Attack has been ordered to occur in this hex.

EXECUTION (FILM) PHASE MAP ICONS

The following icons are used on the game map during the Execution Phase to assist the player in seeing/understanding the execution of the plans made by both sides for the previous turn:


Axis Anti-Air attacking Allies Air asset.


Allies Anti-Air attacking Axis Air asset.

Axis attacking Allies.

Allies attacking Axis.

Meeting Engagement.

Axis ambushing Allies.

Allies ambushing Axis.

Axis Overrunning Allies.

Allies Overrunning Axis.

GAME PLAYING BASICS

"It seemed to me that our pre-war divisional organization was too rigid and lacking in flexibility to be really adaptable to the conditions of modern quick-moving warfare in the Desert, or even elsewhere...
We were not as well trained as the Germans – a fault of our pre-war training. We don't really train for war in peacetime in England – we play at it."

– Field Marshal Sir Claude Auchinleck,
Commander-in-Chief Middle East

SEQUENCE OF PLAY

The following sequence of play is used only for the purposes of describing the unique activities involved in a player's turn. The player is free to follow any sequence he wishes – he can plot a ground movement, then an air mission, allocate supplies, plot a ground attack – whatever. The only thing that is in a sequence is the film – it always plays first.

AXIS PLANNING PHASE

View Film

The film shows the movements and attacks of the previous turn's Execution Phase. The film will appear automatically at the start of each new turn (beginning on Turn 2). The controls for the film work like those on a VCR or DVD player. Clicking on the progress bar will also move the film back/forward. Select the play button to start the film. You can review the film as many times as you wish.

When done hit the Next Phase button.

HQs Supply Allocation

Press the the Supply allocation button to set HQ supply.

All HQs default to **Basic** Supply Level at the start of each planning phase. Change the supply levels for selected HQs by selecting the Supply button on the top left of the game screen, or by right clicking a unit and pressing the supply button. Select **Move+**, **Combat+**, or both. Changing supply levels will cost fuel or ammo points.

Supply cannot be set during the Set-up Phase.

Ground Unit Movement

Select a ground unit or stack of ground units and drag to the desired movement destination hex. Double click a stack or use **Hotkey-F** to select a stack.

Ground Unit Combat

Select a ground unit or stack of ground units and drag to any adjacent enemy-occupied hex. To try and move units to an adjacent enemy occupied hex without engaging in combat, press ALT while dragging the unit.

Ground Asset Assignment

- Allocate Commander Main Effort to Ground Attack/ Support.
- Allocate Electronic Warfare to Ground Reconnaissance.
- Allocate Special Forces to Counter-air.
- Allocate Special Forces to Interdiction.

Air Asset Assignment

- Allocate Air Asset to Ground Attack.
- Allocate Air Asset to Ground Support.
- Allocate Air Asset to Interdiction.
- Allocate Air Asset to Counter-air.
- Allocate Air Asset to Air Reconnaissance.

Naval Asset Assignment

- Allocate Naval Asset to Ground Attack.
- Allocate Naval Asset to Ground Support.
- Allocate Naval Asset to Counter-air.
- Allocate Naval Asset to Interdiction.

Undo Action

The Undo buttons will undo the last planned action.

To undo the actions of a specific unit, place the cursor over the unit and press either **Hotkey-U** (to undo either all its moves or completely remove the battle in which it is involved) or **Hotkey-BACKSPACE** (to undo a single move, or to just remove this unit from a battle).

Pressing **Hotkey-U** when the cursor is over a battle will completely remove the battle.

End Phase

When the phasing player (Axis) is satisfied with all his planning activities, select the 'End Phase' button. This passes control of the game to the next phasing player (Allies).

ALLIES PLANNING PHASE

Repeat phase sequence outlined above.

Execution Phase

This phase is conducted automatically by the computer. Each player's moves and attacks are compared and resolved as necessary. A "film" file is created which is provided to both players as a record of what happened in the previous turn and to set the stage for the beginning of the planning phase.

Game Phases

The game is split up into several phases.

Setup Phase

Each army sets up its units. Units can be dragged to valid hexes. Units may have different setup zones. These zones are highlighted by different colored hexes. Units that can set up in the same zone will have the same colored triangle on the counter's bottom right.

Enemy setup zones are shown as grayed out hexes.

Move Phase

Each side orders their units to move/attack.

When **Dest** is turned on, units are shown at the destination of any move orders. Otherwise, units are shown at their start positions and any moves will be shown if the cursor is placed over the unit.

Only units that start the turn adjacent to an enemy unit can conduct a set-piece attack. Adhoc Attacks can occur between non-adjacent opposing forces as the result of *Move and Attack* orders.

Film Phase
The previous turn's actual moves/battles are shown – subject, of course, to the Fog of War settings.

Victory Phase
The Victory Phase is the last phase of a scenario where the victory result is displayed to both players. Victory results can be an Axis Win, Allies Win, or Draw. Victory is achieved by accumulating more Victory Points (VPs) than your opponent. VPs are awarded for capturing and holding Victory Locations. VPs are also awarded for destroying enemy units.

MAP TERRAIN

There is a variety of different types of terrain. Terrain affects movement, and attack and defense values.

For Terrain Effects Chart. See Appendix A.

Or in game, chick the View Terrain Effect Chart under the Information Button #2 for detailed terrain information.

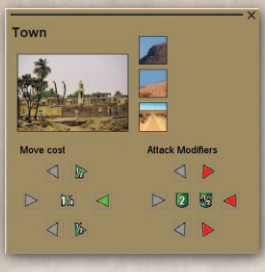
MAP TERRAIN POPUP

Right Click on a map hex and this will display the Terrain popup.

This popup shows the move costs and attack modifiers. If the direction is grayed out, then movement / attacks are not allowed over that hexside. Some hexes (e.g. towns) have different defense modifiers for armor and infantry. In the

example below, the defense of infantry units are doubled, but the defense of armor units is halved.

If the movement cost is less than 1, then this values is only used is the unit is using Road Movement (i.e. the unit's HQ has Move+ supply and the movement order is Road Movement).



Any other terrain in the hex is shown as a small picture in the top right. In the example below, the terrain contains a road, escarpment, and a ridge. Move the cursor over the picture for more information on that terrain.

HEX SIDES (HOTKEY-E).

To help the player see the impacts of terrain on movement and combat, press **Hotkey-E** to display a color coded hex side analysis. A blue edge means the hex side only affects movement. A red edge means the hex side effects combat. Black means the hex side is impassable. As it is possible that multiple conditions could apply, the hex side edge color is determined using the following priorities:

- Black – impassable
- Red – affects combat
- Blue – affects movement

THE WIRE

The “Wire” was built by the Italians along the Libyan-Egyptian border. It offers no defensive bonus but affects movement.

FORTS / ENTRENCHMENTS

Forts and Entrenchments only provide benefit for the owning side.

If an enemy unit starts its turn in a Fort or Entrenchment, then Fort or Entrenchment will be destroyed and permanently removed from the map.

Forts and Entrenchments cannot be created by a player. These features could not be realistically created in the time-span represented by the scenarios in *Desert War 1940–42*.

In this picture, Axis Forts and Entrenchments are on the left, allied ones on the right.

Units will however automatically dig in when they do not move. This represents a basic form of unit defense, but this applies to a unit and not to the hex.

MINEFIELDS

Minefields are located on hex sides.

Minefields are placed by the scenario designer based upon historical records; the player cannot place additional minefields during game play.

Minefield penalties apply to both sides equally (attacking over your own minefield is as disruptive to an attack as attacking over an enemy minefield).

This shows a Combat Engineer after it has breached a minefield.

Minefields are represented by red dots on the map.

Breached minefield are represented by the black dots with the green breach marker on the map.

The effects of minefields are as follows:

- They reduce the attack value of all units attacking across a minefield hex side by 75%. For example, units attacking across a minefield hex side with an attack value of 16 would be reduced to an attack value of 4.
- Units attacking across a minefield hex side lose any intrinsic Shock value they may have. Units defending against an attack across a minefield hex side retain their Shock value.
- Units moving across a minefield hex side expend their entire movement allowance. Therefore, to cross a minefield the unit must start adjacent to the minefield.
- HQs cannot trace lines of communications across minefields; minefields block supplies.
- ZOCs do not extend across minefield hex sides.

Combat engineer units can breach minefields – establish lanes through the mines so friendly units and supplies can pass through safely. Breached minefields remain in place but at reduced effect. See Combat Engineers for more information.

The effects of a breached minefield are as follows:

- The attack value of all units attacking across a breached minefield hex side is reduced by 50%.
- Units can cross a breached minefield at a cost of 3 Movement Points.
- HQs can trace lines of communications to subordinate units across a breached minefield hex side; breached minefields do not block supply.
- ZOCs extend across breached minefield hex sides.

GROUND UNITS

Ground units are the central “playing pieces” of the game. Ground combat units can range in size from platoon to battalion level. These units are under the control of headquarters units that span from regimental/brigade level to theater level. Each ground unit is assigned an Attack Value, Defense Value, and a Movement Value. These basic values are modified based upon various situations. The Final Attack and Defense values used to resolve combat depend upon several factors such as:

- Reduced Strength.
- Reduced Readiness.
- Artillery Range Effectiveness.
- Organizational Integrity.
- Supply Level.
- Dug in Status – Defense Value of Dug in Units is increased by 20%.
- Hex Terrain – Defense Value increases due to benefits of terrain.
- Hex-sides (e.g. Rivers/Contours) – Attack Value decreases when attacking over certain hex-sides such as Rivers.

When one ground unit attacks another, the attack odds are found by dividing the attacker's Final Attack Value by the defender's Final Defense Value. See Battles for more information.

UNIT COUNTERS

The colored triangle in the lower left indicated the Setup Zone (and will only appear during the Setup Phase).

If a unit is ordered to *Wait* (**Hotkey-W**), then a dark triangle will appear in the lower right of the counter.

The Axis player controls the following units as below.

Counter	Army	Color (Counter & Unit Icon)
	German Army Units	Light Tan with Light Tan center
	Italian Army Units	Light Grey with Pale Yellow center

The Allies player controls the following units:

Counter	Army	Color
	Australian Army Units	Dark Green with Brown center
	British Army Units	Dark Green with Tan center
	Free French Army Units	Dark Green with Light Blue center
	Indian Army Units	Dark Green with White center
	Polish/Czech/Greek Army Units	Dark Green with Red center
	South African Army	Dark Green with Purple center
	New Zealand Army	Dark Green with Blue center

UNIT DETAILS POP UP

Right clicking on a unit will open the Ground Unit Popup. Right clicking again on the same unit will close the pop up. Alternatively, close the pop-up by clicking the X in the top right of the display or pressing the SPACEBAR.

Moving the cursor over the icons will display more information about that icon. E.g. when moving the cursor over the Anti-Aircraft gun on the top left of the grey counter, the display will update with a description of what this icon means.

GROUND UNIT SIZES

Unit Size is illustrated on the top of the counter by one of the following:

- XX: Division (roughly 10,000 – 15,000 men)
- X: Brigade (roughly 5,000 men)
- III: Regiment (roughly 2,000 men)

- II: Battalion (roughly 1,000 men)
- I: Company/Battery (roughly 100-300 men)

If a number is displayed instead of the Size, then this number is the Regiment/Battalion/Company ID.

The information on a unit depends on the zoom level. At highest zoom level, the unit counter has the following data. All numbers are effective values.

STACKING LIMITS

There is a limit to the number of ground units that are allowed to occupy a hex on the map. Each ground unit is assigned a number of Stacking Points (SPs) based on the unit's size. Generally, those stacking points are as follows:

Unit Stacking Points	
Unit Size	**# of Stacking Points**
Platoon	1
Company/Battery	1
Battalion	3
Regiment HQs	1
Brigade HQs	1
Division HQs	2
Corps HQs	3
Army HQs	4

The maximum stacking limit for a hex is 8 stacking points.

Stacking limits apply at all times during game play so be careful how you plan your movements. If a hex is at maximum stacking limit, you cannot move units into it or through it.

TIP: Use the Wait Command ***(Hotkey-W)*** *to help de-conflict potential stacking limit issues that may occur during movement.*

QUALITY

Units have one of the following values:

- Conscript
- Green
- Regular
- Veteran
- Elite

A unit's quality is displayed on the right hand pane's unit details, and by right clicking a unit to open the unit information pop up. To see the quality of all units, you can use the Display Options and select "Display unit quality" from the "Unit border options" menu.

Quality affects:

- the rate of readiness recovery
- battle odds: which are shifted by the quality difference between attacker/defender

- battle damage: higher quality units receive less battle damage than lower quality units
- the chance of Holding / Withdrawing
- overruns: only Regular or higher quality units can overrun

NOTE: Quality is reduced by one level if a unit's HQ is destroyed.

EFFECTIVE ATTACK AND DEFENSE VALUES

Units have a Attack and Defense values which increase / decrease for a variety of reasons. This altered value is the effective Attack / Defense value.

Attack and Defense values can change because of:

- reduced strength
- reduced readiness
- extra supply (Combat+ supply)
- Lines Of Communication State
- artillery can be reduced due to lack of intel (see Artillery below)
- unit integrity
- dug in states
- terrain effects
- Movement values can change because of:
- Readiness

- Lines of Communication state
- extra supply (Move+ supply)

STRENGTH

Strength represents the number of tanks, soldiers, and guns in a unit.

If a unit is at half strength, then its *effective* Attack / Defense Strengths will be half of the maximum. Movement Points remain the same. Strength can be reduced by casualties in battle and the reductions are permanent.

Strength can change due to:

- Casualties caused in battle.
- Reductions due to being **Encircled**.

READINESS

Readiness represents how fresh/rested a unit is. This is reduced by unit actions (moving, attacking etc.).

Low Readiness reduces the Effectiveness of the Attack / Defense / Movement values. At 0% readiness, effective Attack will be reduced by 66%. At 0% readiness, effective Defense / Movement points reduced by 50%.

When a unit loses readiness from a battle or from being **Encircled**, loses are first taken from Readiness, then Strength.

Unlike reduced Strength, Readiness increases when a unit rests.

READINESS RECOVERY – RESTING

If a ground unit does not move and is **Supported** (see Lines Of Communication) then its readiness % is increased as follows every turn these conditions exist:

- Elite: 28%
- Veteran: 24%
- Regular: 20%
- Green: 16%
- Conscript: 12%

If the unit is in an enemy ZOC, then these values are decreased by the ZOC level multiplied by 2, up to a max value of 10.

For example:

- if a unit is in enemy ZOC of 3, then its readiness increase will be reduced by 6 (3 * 2) e.g. 2.
- if a unit is in enemy ZOC of 8, then its readiness increase will be reduced by 10 (8 * 2 = 16, but max is 10).

DEFENDER READINESS

Defending units will recover readiness, though reduced by any damage sustained in an attack.

For example, if a Regular Quality unit is resting and not in an enemy ZOC then it should increase its readiness by 20 per turn. If it is attacked and sustains 3 damage to strength and 8 to Readiness, then it will only increase its readiness by 9 (*max readiness increase of - damaged sustained*): 20 - (3+8) = 9.

If you right click on a ground unit, the pop-up Unit Details pane shows the number of turns till the unit's readiness reaches 100% if it rests or reaches 0% readiness for encircled units.

ENCIRCLED READINESS

If unit does not move and is **Encircled**, then every turn:

- Readiness decreases by 15 if not in an enemy ZOC.
- Readiness decreases by 15 plus the enemy ZOC level multiplied by 2, up to a max value of 10.

MOVE READINESS

If a unit moves, then Readiness changes due to movement:

- Decrease by 10 if uses its full movement points.
- Rounded up percentage of full movement used (i.e. if use 50% of movement points, then decrease by 5).

ORGANIZATIONAL INTEGRITY

Whenever ground units subordinate to *different* HQs attack or defend together – it is possible that penalties will be imposed on the final attack and/or defense value. This reflects a nation's capability to conduct – and its ability to coordinate – combined arms operations.

See table below. The number of HQs "jumps" required to find a common Higher HQs (HHQs) is used to calculate the penalty.

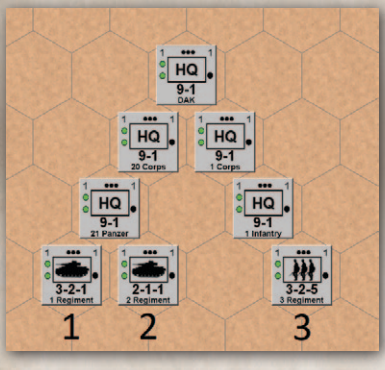
Organizational Integrity - ATTACKER				
		Attack with Others – Coordinating HQs		
Nation	Attack Alone	Same HHQ	HHQ 1st Removed	HHQ 2nd Removed
Germany	100%	100%	90%	80%
Italy	100%	80%	65%	50%
Commonwealth**	100%	90%	80%	70%
United States	100%	85%	75%	65%
Minor Allies*	100%	85%	75%	65%

Organizational Integrity - DEFENDER				
		Defend with Others – Coordinating HQs		
Nation	Defend Alone	Same HHQ	HHQ 1st Removed	HHQ 2nd Removed
Germany	100%	115%	95%	90%
Italy	100%	100%	80%	75%
Commonwealth**	100%	110%	90%	85%
United States	100%	105%	85%	80%
Minor Allies*	100%	105%	85%	80%

* Minor Allies Nations: Free France, Poland, Czechoslovakia

** Commonwealth Nations: Great Britain, Australia, New Zealand, South Africa, India

In the picture overleaf, units 1 and 2 have a HHQ of 0 (they have the same HQ). If they are German units, they should attack together at 100% and defend at 115%.



Unit 3 has a HHQ of 2 from units 1 and 2. This means there are 2 jumps from 3's HQ to a higher HQ that it shares with units 1 and 2 (i.e. 1 Infantry HQ -> 1 Corps HQ -> DAK HQ). Note that the harshest penalty is always applied, so if unit 3 was Italian, then all 3 units would attack at 50% and defend at 75%. This penalty is applied regardless of the relative strengths of the units involved.

FIXED UNITS

Some units are fixed in place and cannot move. These units will have a 'F' on their counter and 'FIXED' on their unit details in the Info Panel.

If the 'F' is red, then the unit cannot move. If the 'F' is green, then the unit can move in a restricted area.

This may only last for a certain number of turns or until an enemy unit moves adjacent. Right click on the Fixed unit and move the cursor over the 'F' icon for more information.

If a unit is fixed, but it is forced to retreat outside its fixed area, then it becomes unfixed.

GROUND UNIT TYPES

There are many different types of ground units in the game. They are represented on the map using the following symbols. Press **Hotkey-N** to toggle between them.

NATO Icons	Stylized Icons (examples)	Unit Type
HQ	HQ	Headquarters Unit. See HQs Units.
		Armored/Tank Unit. See Shock.
		Infantry Unit (foot mobile).
		Mechanized Infantry Unit.
		Motorized Infantry Unit.
		Parachute/Airborne/Airborne Infantry Unit.
		Machinegun Unit
		Artillery Unit.
		Self-propelled Artillery Unit.
		Reconnaissance Unit.
		Motorcycle Unit.
		Combat Engineer Unit. See Minefields / See Fortifications
		Antitank Unit. See Shock.
		Heavy Antitank Unit. See Shock / See Anti-Aircraft Units.

		Self-propelled Antitank Unit. See Shock / Anti-Aircraft Units.
		Anti-Aircraft Unit. See Anti-Aircraft Units.
		Heavy Anti-Aircraft Unit. See Anti-Aircraft Units.
		Supply Unit.

HEADQUARTERS UNITS

HQs Units affect:

- Organization Integrity (bonus/penalty for units of different HQs attacking/defending together).
- Lines Of Communication State.

To view which units belong to the same organization, press **Hotkey-H** to turn the display of HQ Chain of Command lines on/off. The color of the lines reflects the Supply State of the LOC Lines Of Communication (LOC) state between the unit and its HQs:

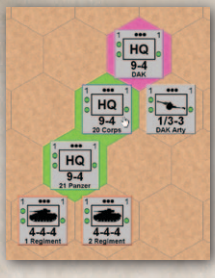
- Green = Supported
- Yellow = Extended Support
- Red = Isolated
- Black = Encircled

HQ organization is the assignment of subordinate ground units to a head-quarters. This is set by the scenario designer; it cannot be changed by the player during game play.

To view the HQ range, press **Hotkey-R** when the cursor is over the HQ. Hexes in Supported range will be green, those in Extended Support range will be yellow.

Below is another way to view the units controlled by a HQ.

Cursor over HQ example.



DAK HQ directly controls 20 Corps and DAK Arty

20 Corps directly controls 21 Panzer HQ.

21 Panzer HQ control 1 and 2 Regiments.

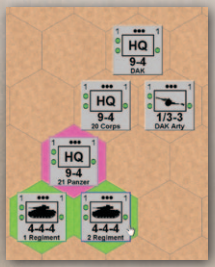
In this example The Cursor is over 20 Corps HQ.

Pink – the HQ of this unit (DAK is pink as DAK is 20 Corps HQ).

Green – units directly controlled by this HQ.

Blue outline – the current unit.

Red outline – units not directly controlled by this HQ, but under a lower HQ that is controlled by this HQ.



In this example The Cursor is over 2 Regiment.

Pink – the HQ of this unit.

Green – units that share the same HQ as this unit.

Blue outline – the current unit.

RECONNAISSANCE (RECCE) UNITS

A recce unit's primary function is to gain battlefield intelligence; to observe and report on the strength, activity, location and disposition of enemy forces. Generally, they will attempt to avoid direct-fire contact with enemy forces.

For this reason, unless explicitly ordered to do so, recce units **will not** enter enemy ZOCs and will automatically withdraw from enemy ZOCs if friendly or enemy movement places them in this position. This only applies to ZOCs exerted by non-recce enemy units; friendly recce units will not automatically withdraw from enemy recce units ZOCs.

Specific recce rules are as follows:

- A recce unit without *Hold, No Retreat* orders will withdraw from the hex it occupies if a non-recce enemy unit moves adjacent to it. The recce unit will attempt to withdraw to an adjacent hex not in an enemy ZOC.
- Unless under *Move and Attack* orders, a friendly recce unit will never move into the ZOC of an enemy non-Recce unit.
- Recce units have a greater Intelligence Range than any other ground unit (see Fog of War).
- Recce can move once before a battle occurs. In other words, they can move out of the hex they occupy at the start of the turn – before an enemy attack on that hex occurs.

- Recce units will always try to *Withdraw* from a battle (even when they do not have *Withdraw* orders), unless they have *Hold, No Retreat* orders.
- Recce units have a higher chance to *Withdraw* than other units.

ARTILLERY UNITS

Artillery units that do not move can defend friendly units or attack enemy units from a distance.

The effectiveness of the artillery fire does *not depend on range but depends on the intel of the target hex.*

Artillery is most effective when combined with ground attacks.

To use artillery, press **Hotkey-R** when the cursor is over an artillery unit to enter *Artillery Fire Mode*. All hexes within range of the artillery unit will be highlighted in Green.

Place the arrow cursor over an enemy unit that is in range and the cursor will change to a crosshair (shown below). Click on the enemy unit and that will order the artillery unit to fire by itself or in conjunction with other friendly forces attacking the same hex. If you put the arrow cursor over a friendly unit that is in range, the cursor will change to a shield (shown below on the right). Click on the friendly unit and that will order the artillery unit to fire in support of that unit should it be attacked by the enemy.

 When this cursor is shown, artillery attacks will be ordered on enemy units.

When this cursor is shown, defensive artillery fire will be ordered on friendly units.

When selected, the firing artillery unit(s) have a blue border as below, and will be highlighted in the right hand pane.

Here, an Allied artillery unit (the PILGRIM unit) is being ordered to attack the Savona unit. Note the aiming cursor.

Pressing **Hotkey-R** again, or clicking on the map, will unselect the artillery unit.

Alternatively, artillery units can attack by dragging and dropping them onto the target.

Hotkey ALT-R will select ALL artillery units in a hex in fire mode. When a target is selected, all units will be assigned to attack/defend that target.

Hotkey SHIFT-R will select the next available artillery unit in fire mode. The map will center on the units hex, the unit will be put at the top of the stack, and the unit's range will be displayed.

An artillery unit providing Offensive Support has its attack value added to the attack factors of all other friendly units involved in an attack against an enemy occupied hex.

An artillery unit providing Defensive Support to a friendly occupied hex (other than their own hex) will have their attack factor added to the defensive total of that hex. Artillery units

defending in a hex that is under attack by the enemy will use their defense factor.

If an artillery unit had orders to provide Defensive Support to an allied unit which was not attacked will rest and recover readiness as if it had no orders.

ARTILLERY TARGET'S INTEL LEVEL

Artillery (and Air and Naval) attack strengths can be reduced or increased based on the level of intelligence acquired about enemy units in the target hex (see Fog Of War). Attack factors of artillery units, and naval and air assets* being used to attack enemy unit(s) in a hex are modified as follows:

Average Intel Level of Hex	Artillery /Naval /Air Attack Factor Multiplier
0	No Fire
1	0.15
2	0.35
3	0.75
4	1.00
5	1.10

Round fractions down for the average intel in a hex; however, cannot be reduced below one. The AF of artillery and naval units supporting a friendly ground unit defense (Ground Support mission) equals AF x 1.00.

ARTILLERY ONLY ATTACKS

Artillery attacks are most effective when combined with ground attacks (i.e. a Combined Arms attack).

Artillery only attacks have *low* Battle Intensity and will inflict lower casualties than normal.

If the battle has more artillery than ground units, then its Intensity is reduced by 1 level (to a minimum of *low*)

If the battle has 2 times more artillery than ground units, then its Intensity is reduced by 2 levels (to a minimum of *low*).

The above will never reduced a Battle Intensity to below *low*.

ANTI-AIRCRAFT (AA) UNITS

When an Air asset attacks a ground unit, the Air asset is subjected to an Anti-Aircraft (AA) attack **BEFORE** the ground attack takes place. The result of the AA attack may affect the subsequent ground attack by the Air asset.

- **Ground** units have an intrinsic AA strength equal to their stacking point value.
- **Light Anti-Aircraft** units have an AA strength x3 their stacking point value.
- **Heavy Anti-Aircraft** units have an AA strength x4 their stacking point value. This value extends into adjacent hexes.

Air assets assigned to Defensive Ground Support will also suffer AA attacks. However, the AA value is halved (excluding Heavy AA units which remain at full AA Strength).

The AA strengths of each hex can be seen by pressing **Hotkey-A**. The "redder" the hex color, the higher the AA strength of the hex. The diagram below shows the Axis players AA strengths.

First it will show the Axis (Side 0's) AA Strength and then the Allies (Side 1's) AA Strength.

The total air AA strength of a hex is compared to the each Air asset's Defense strength to determine the AA Attack Ratio. As with Ground Attacks, the difference in quality of the units shifts the odds.

See 'Anti-Aircraft (AA) Attacks' for more information.

COMBAT ENGINEER UNITS

If attacking a hex containing a Fort or Town, Combat Engineers add a 0.5 shift to the Attackers odds. This benefit

is only available if the Combat Engineers has an effective attack value of at least 30% of its maximum attack value. Multiple Combat Engineer units do not add extra shifts. The maximum shift is 0.5. Combat Engineers do not add odds shifts for defenders.

Combat Engineers can also breach Minefields.

When adjacent the a minefield, Combat Engineers can be ordered to attempt a breach. Right click on the unit counter and then press the breach button to turn on/off a breach order. The order will remain in effect over subsequent turns unless the unit is given subsequent orders or all adjacent minefields are breached. Combat Engineers have a 50% change of breaching each adjacent hex-side containing minefields.

DECOY UNITS

To simulate the ability of a side to deceive an opponent, decoy units are present in some scenarios.

When playing with Fog Of War, these weak units can be used as decoys that might appear as unknown units or misidentified units when an enemy has limited intel strength on the decoy's hex. Of course, if the intel strength is high enough, the decoys will be identified as such.

AIR ASSETS

"In [the] future the battle on the ground will be preceded by the battle in the air. This will determine which of the contestants has to suffer the operational and tactical disadvantages..., and thus be forced, throughout the battle, into adopting compromise solutions."

– Erwin Rommel

"Throughout the day, bombers, fighters, and fighter-bombers of the Desert Air Force shuttled to and fro, stopping only just long enough to rearm and refuel. Altogether nineteen separate attacks were made, and considerable damage seemed to have been done. The diary of the 90th Light Division, however, refers to low-flying and bombing attacks throughout the whole day – in all about twenty attacks made by six to ten aircraft at a time – which they said, had no effect upon the morale of the division and had done only slight damage to their vehicles."

– The Mediterranean and Middle East, vol. III,
Maj-Gen I.S.O. Playfair

Air assets can be accessed by pressing the Air button on the left toolbar bar. If this button has a red ring, then air assets are available for missions. If it is green, then all asset have missions.

There are two types are air assets in *Desert War 1940–42*:

- **Attack Assets:** These units can attack enemy ground units, provide offensive and defensive ground support to friendly ground units, counter enemy air capabilities, and interdict movement of enemy forces and supplies.

- **Air Reconnaissance Assets:** These units can carry out reconnaissance missions against any hex on the map to try and find and identify enemy units.
- **Air Transport Assets:** (Not Implemented).

The status of individual air assets can be determined by right clicking on the air asset image in the air asset display.

Air assets have a ground support factor, a ground attack factor, and a defense factor.

- **Ground Support Factor.** This is used when assisting a ground attack.
- **Ground Attack Factor.** This is used during air-only attack (or in conjunction with artillery or Naval units).
- **Defense Factor.** This represents the Air Assets ability to withstand damage from anti-aircraft fire; there is no direct "air-to-air" represented in the game.

Air Unit Quality affects Readiness Increase in exactly the same way as for ground units, i.e. conscript increase by 12%, Med by 20%, Elite by 28% per turn.

Quality and defense against ground AA fire. See 'Anti-Aircraft (AA) Attacks'.

Air Asset Quality does NOT affect the Ground Support / Ground Attacks.

For more information on a unit, either right click the unit button to open the unit details pane, or examine the tooltips.

AIR PLANNING PANEL

This is displayed when the Air Asset button is pressed.

Different air units can be selected by pressing the unit button. Depending on the type of unit displayed, the numbers on the button may vary. The green and yellow bars under the values are the readiness and strength of the unit.

The rightmost value is alway the Mission value. This can have the following values:

- R – Recon
- A – Ground Attack
- S – Offensive Ground Support
- D – Defensive Ground Support
- I – Interdiction
- C – Counter Air

For more information, either right click the unit button to open the unit details pane, or examine the tooltips.

AIR RECON UNITS

Air Recon units can only conduce Air Reconnaissance missions.

ATTACK UNITS

Ground Support Units can fly four types of missions: Ground Support, Ground Attack, Counter-Air, and Interdiction. A Tactical Air Support Unit can be assigned only one mission per turn. Units performing a mission will suffer a decrease in readiness and potential loss of strength due to anti-aircraft fire.

AIR ASSET MISSIONS

Air Units can be allocated the following missions:

- Allocate Air Assets to Ground Attacks. Air assets can attack enemy ground units on their own.
- Allocate Air Assets to Ground Support. Air assets with the capability to provide ground support can assist ground attacks by shifting attack or defense odds for the hex they attack/support.
- Allocate Air Assets to Interdiction. Air assets allocated to interdiction will destroy fuel and ammo points, slow movement of enemy grounds units, and reduce the supply range of enemy HQs.
- Allocate Air Assets to Counter-air. Air assets allocated to counter-air will reduce the effectiveness of enemy air assets.
- Allocate Air Assets to Air Reconnaissance. Air reconnaissance assets can provide information about the location and movement of enemy ground forces.

GROUND SUPPORT MISSION

Ground Support mission increase / decrease the odds of an ground attack / defense.

This mission is used when an Air asset supports a ground attack. This mission is subject to enemy Counter-Air and Anti-Aircraft attacks prior to its execution. The ground attack's odds are increased by the Air asset's Ground Support value. Few Air assets have this capability early in the war as it required

special training. However, as the war proceeded more and more squadrons gained this capability.

Ground Support effectiveness decreases with the number of units added. The strongest air asset attacks using 100% of its ground attack value. The next strongest air asset attacks at 50% effectiveness. The next attacks at 33% effectiveness. The next attacks at 25% effectiveness, etc.

The Ground Attack mission is subject to enemy Counter-Air and Anti-Aircraft attacks prior to its execution.

Ground Support units can also defend friendly units. The Ground Support value reduces the attacker's odds.

GROUND ATTACK MISSION

Ground Attack missions are air-only attacks that do not assist ground attacks. These missions are the same as artillery or naval attacks.

This mission is flown by air assets that attack enemy ground units without any assistance from friendly ground units. The Air asset's Ground Attack value is compared to the total defensive value of all enemy ground units in the hex under attack.

If a Ground Attack mission is ordered against an enemy and subsequently a ground unit also is ordered to attack that enemy, then the Ground Attack mission becomes a Ground Support mission. If the air unit cannot perform Ground Support missions (as it has not Ground Support factor), then during execution the mission will be cancelled.

As with Ground Support missions, Ground attacks effectiveness reduces with the number of units employed, and they are also subject to Anti-Aircraft attacks.

"Another of the difficulties of the Air Force in helping the Army was that the 'bomb line', or line beyond which anything seen might be attacked, was not easy to define in practice, for instead of there being a clearly defined front the forces of the two sides were often biting each other's flanks or tail. Aircraft were rarely able to join in a swaying fight between the armored forces, and even on the fringe of such a fight they could not always tell friend from foe."

– The Mediterranean and Middle East,
Major-General I.S.O. Playfair

COUNTER-AIR MISSIONS

Counter-Air Missions are those which attempt to disrupt enemy air operations, not just by attacking enemy aircraft in the air (fighter sweeps, combat air patrols, etc.) but also by attacking enemy airfields, RADAR, command facilities and communications. Counter-Air will have an effect on all types of enemy air missions.

To assign a Counter-Air Mission to an Air asset go to the Air Planning Panel, click on the Air asset button of an already selected unit. NOTE: If Readiness or Strength of a unit is less than 50%, the unit cannot be assigned to Counter-Air.

A friendly air asset assigned to Counter-Air adds "anti-aircraft points" to the Anti-Aircraft value of every hex attacked by enemy aircraft.

Each air asset assigned to Counter-Air will add one (1) anti-aircraft point to every friendly occupied hex that is attacked by an enemy air asset during a single turn. But every enemy air asset assigned to Counter-Air will counteract one friendly units assigned to Counter-Air.

For example, if the Axis player assigns 2 air assets to Counter-Air and the Allies player assigns 3 air assets to Counter-Air, then the Axis player gets no anti-aircraft plus up, but the Allies player gets +1 added to the anti-aircraft strength of ALL his unit stacks. If no Axis air assets were assigned to Counter-Air in this example, then the Allies would get +3 added to the anti-aircraft strength of ALL his unit stacks.

Base Counter-Air (BCA) Values. Each side in a scenario is assigned its own BCA value. These values can be found in the text of the scenario description. This value can range from 0 to 5.

This means that even with no Air assets manually assigned to Counter-Air, a side can still have a Counter-Air value. The BCA value represents the effects of the following factors on counter-air operations:

- Air Superiorty.
- RADAR availability, quality, and how well it was integrated into counter-air operations.
- Sortie rates versus those of the opposing side. This factor represents the effects of proximity of friendly airfields to the battlefield (i.e. time of flight to target area vs loiter time vs turn-around).

- Operational Readiness of available aircraft. This factor represents the availability of repair parts, tool kits, trained technicians, and the technologies to overcome the impacts of the harsh desert environment on aircraft.

COUNTER-AIR RESULTS

Open Turn Information to see the effects of Counter-Air missions.

The Counter Air results panel shows the results of the previous turn's Counter Air missions.

In the example shown here, the Axis had 2 counter air missions and the allies had 1.

This means the Axis had a Counter-Air advantage of 1.

This results in Allied Interdiction missions being reduced by 1, and all Axis AA defense being increased by 1.

INTERDICTION MISSIONS

"We had a Divisional Forward Ammo Point, feeding the Forward Ammo Point up the front. We kept to the desert to avoid the Messerschmitt's which patrolled the tracks and liked nothing better than strafing ammo lorries. Dispersal was the answer – there was no cover – so every lorry stayed 200 yards or more from the others."

– Sergeant Rick Hall, 10 Company RASC,
7th Armored Division

Interdiction Air Missions are those which attempt to disrupt enemy ground operations, by reducing enemy movement, HQs ranges, and the amount of ammo and fuel points received each turn.

To assign an Interdiction Air Mission to an Air asset, click twice on the air asset button of an already selected unit.

NOTE: If Readiness or Strength of a unit is less than 50%, the unit cannot be assigned to an Interdiction Mission.

Interdiction Results Table			
# of Air assets on Interdiction	Fuel Points Lost	Ammo Points Lost	Div HQ & Above LOC Range Decrease
1	6	4	5%
2	8	5.5	10%
3	10	7	15%
4	12	8.5	20%
5	14	10	25%
6	16	11.5	30%
7	18	13	35%
8	20	14.5	40%
9	22	16	45%
10+	24	17.5	50%

Determining the Number of Interdiction:

- Players allocate air assets to the Interdiction mission at any time during their particular planning phase.

- The number of Interdiction Units is reduced by the number of enemy Counter-Air assets. Enemy Counter-Air missions can result in friendly Interdiction missions being aborted.
- If the number remaining is equal to one or more, then that number is indexed in the table above and the results are applied.

For example: The Axis player allocates 2 air assets to Counter-Air. The Allies player allocates 4 air assets to interdiction. Subtract 2 (Axis count-air assets) from 4 (Allies interdiction units) = 2 remaining Allies air assets on an interdiction mission.

Indexing two on the interdiction table shows that:

- This turn's Axis fuel increase is reduced by 8 points.
- This turn's Axis ammo increase is reduced by 5 points, with a 50% chance of a second point being destroyed.
- The range of Axis division and higher HQs supply ranges are reduced 10% (round up). In other words, if the normal range of division and Higher HQs is 24, so 10% of 24 = 2.4 rounded up to 3. Therefore, Axis supply range is decreased from 24 to 21.
- The movement factors of ALL Axis units is reduced by 10% (rounded up). An Axis tank battalion with a movement factor of 16 would be reduced to 14, (16 x 10% = 1.6 rounded up to 2).

INTERDICTION RESULTS

Open Turn Information to see the effects of enemy interdiction.

Interdiction affects the arrival of supply, enemy movement, and HQ LOC as shown here in the Turn Information panel.

Air, Naval, and Special Forces units can be ordered to interdict supply. These can be countered by assigning friendly units to Counter-Air missions.

In the example here, the Allies have assigned 2 units to interdiction, but the Axis have a Counter – Air advantage of 1, so the the Allied interdiction missions are reduced to 1.

This reduced Allied Ammo by 6 and Fuel by 4.

Total new Axis supply this turn was 16 and 4, so reducing those by 6 and 4 gives new supply of 10 Ammo and 0 Fuel.

The interdiction also reduced HQ Lines Of Communication by 5% and all unit's movement points by 5%.

AIR RECON

Air Recon units can conduct Air Reconnaissance missions against hexes.

Air Recon units have two values:

- **Recon Range:** The hex radius from the target hex over which this unit can collect intelligence.
- **Recon Intel Level:** The Intel Level of intelligence gathered. Intel Level decreases the further one gets from the target Hex.

These missions are not subject to Anti-Aircraft attacks.

See Fog of War for more info.

NAVAL ASSETS

Naval assets can be accessed by pressing the Naval button on the left toolbar bar.

Naval assets are considered "floating artillery" in *Desert War 1940–42*. Like artillery units, Naval assets can provide Offensive and Defensive Ground Attack to friendly ground units that are within its range; the range being the Naval assets distance from the sea coast.

NAVAL PLANNING PANEL

This is displayed when the Naval Asset button is pressed.

Once a Naval asset is used, it may disappear for the remainder of the scenario, or return after a few turns. The availability of this capability should be noted in a scenario's description.

For more information on a unit, either right click the unit button to open the unit details pane, or examine the tooltips.

NAVAL ASSET MISSIONS

Naval units can be allocated the following missions:

- Allocate Naval Assets to Ground Attack. Naval assets by themselves can attack enemy ground units within range of the sea.
- Allocate Naval Assets can perform counter-air or interdiction missions.

GROUND ASSETS

Ground assets can be accessed by pressing the Ground button on the left toolbar bar.

There are two types are air assets in *Desert War 1940–42*:

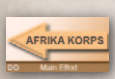
- **Intel Assets:** These units can conduct recon mission.
- **Command Assets:** These assets can perform Ground Support mission.
- **Special Forces:** These units can perform counter-air or interdiction missions.

GROUND ASSET MISSIONS

Ground Assets can be allocated the following missions:

- Allocate Intelligence and Electronic Warfare (EW) Assets. EW assets can provide information about the location and movement of enemy ground forces.
- Allocate Command assets (Main Effort/Surprise and/or Maneuver, etc.) to Ground Support. These assets provide odds shifts to the attacks/defenses they support.
- Allocate Special Forces (SF) Assets. SF assets can perform counter-air or interdiction missions.

COMMAND ASSETS



There is something real and tangible in designating something the main effort or auf deutsch – schwerpunkt. The player can control most of the tangible resources that make-up the main effort. The player can concentrate maneuver forces (armor and infantry) at the point he deems decisive.

The commander can reinforce the main effort with combat support units (artillery, AT, AA, combat engineers), or can allocate Combat+ Supply Level to the organization that is the main effort. But what he can't add in is the intangible – but key – elements of command and control like the commander's presence on the battlefield at the decisive place at the decisive time. Or the commander's use of his staff to coordinate, deconflict, synchronize operations in a time-constrained decision cycle. So...how to represent the intangible? The Main Effort asset. The player can now decide where to put that intangible thing too.

SHOCK

A major effect of armored and mechanized forces is mental – shock. Armored forces use rapid mobility, firepower, and shock effect to close with and destroy the enemy. The movement factor covers mobility (or lack of it), and firepower is covered by the attack factor versus the defense factor. That leaves the shock effect to be accounted for in some way.

What creates the shock effect of armored forces? The speed and/or the direction of an attack (especially in the flank and/or rear – and having the mobility to get there) with overwhelming firepower quickly brought to bear at the point of attack that destroys (kills, captures, and/or causes to cower) units within the enemy's command...which in turn reduces, eliminates, or frustrates the options available to the enemy commander – that's shock effect. So, a player attaching an armor battalion to a slow foot-slogging infantry division with a low attack value will be punished.

SHOCK – GENERAL RULES

Some units have a Shock Value which results in Shifts to Combat Odds.

This means, the more units participating in a battle with a Shock Value, the higher the percentage of Shock that is used to calculate odds shifts. Mobile ground units like armor and mechanized infantry have a Shock Value. Less mobile units like foot-mobile infantry have no Shock value.

NOTE: A unit with a Shock Value of 0 is still considered a Shock unit.

So an armored battalion attacking with a much bigger infantry division will only use a small percentage of its Shock Value. But the same armored battalion supported by other mobile units will use its entire Shock Value.

Shock values are displayed in the Unit Details Panel.

Shock is only applicable for attacks against an enemy in open terrain (i.e. the hex itself has no defensive bonus).

Units that are attacking over a terrain hexside (e.g. a gully) have No Shock.

Shock values are halved if the unit has:

- Readiness less than 30%
- Strength less than 30%
- Lines Of Communications State of Encircled or Isolated

Shock values are 0 if the unit has:

- Readiness less than 10%
- Strength less than 10%

Possible Shock values are shown below:

Shock Types	
Icon	Description
	Shock Value of 4
	Shock Value of 2 when Attacking. Shock Value equal to attacker when defending.
	Shock Value of 0 when Attacking. Shock Value equal to attacker when defending up to a max value of 2.
	Shock Value of 0 when Attacking.
	No Shock Value. This unit will reduce the total Shock of a stack if this unit attacks/defends with units that have Shock.

Shock shifts the odds of an Attack by the Shock value. A side's Shock is the maximum Shock value of any of its engaged unit, reduced by the percentage of units that have no shock. The percentage is calculated on units' stacking sizes.

If only half (measured by Stacking Size) of the units have Shock, then only half the maximum Shock Value is used.

The Shock value is calculated for the Attacker and Defender. The Final Shock is Attacker Shock – Defender Shock. If the result is negative, then the odds are reduced by that number of shifts.

Example 1
If attack consists of:

- an Armored (Shock 4) unit of Stacking size 4
- a motorized (Shock 0) unit of stacking size 2
- an infantry (no Shock) unit of stacking size 2

Then the basic (maximum) shock of any unit (from the Armored unit) = 4.

The stacking size of shock units (the Armored and Motorized unit) = 6

The total stacking size of all units = 8

So percentage of Shock units = 75% (6 as a percentage of 8).

So 75% of 4 = 3

Final Attacker Shock = 3 (defender has no Shock).

If the enemy has no shock values, then battle odds will then be shifted by 3 in favor of the attacker.

Example 2
If an attack consists of:

- an Armored (Shock 4) unit of Stacking size 1
- a larger infantry (no Shock) unit of stacking size 3

Then the final Shock = 1 (25% of attacking stack has Shock, 25% of the max shock 4 = 1).

Example 3
If an attack consists of:

- 2 Armored (Shock 4) units of Stacking size 1
- 1 of the 2 units is attacking over a gully hexside.

Then the final Shock = 2 (50% of attacking stack has Shock – the unit attacking over the gully is considered to have No Shock. 50% of the max shock 4 = 2).

SHOCK AND ANTITANK UNITS

Antitank units are normally defensive. They neutralize an attacker's Shock but normally do not have a Attack shock greater than 0.

However, German AT/AA (so called Heavy AT units) – units equipped with 76mm or 88mm guns – attack with a Shock of 2. For an AT/AA weapon to be used offensively against tanks (not against infantry), it must be able to shoot substantially farther than any tank it is advancing against in order to cover the movement forward of another friendly AT unit. The Germans did this often and successfully by leap-frogging platoons or batteries of 88s (and later with Soviet 76mm AT guns captured in Russia and shipped to Africa) towards enemy tank formations. The British and Italians did use portees but if the range of the gun your unarmored portee shoots is at or less than the range of the gun of the tank you are attempting to maneuver against well then you shouldn't be "shocked" when the tank blows you away!

ZONES OF CONTROL

Each ground unit (friendly and enemy) exerts influence into the hexes adjacent to the one it occupies. This area of influence is called the Zone of Control (ZOC). It costs no Move Points to leave an enemy ZOC but it does cost to enter one.

ZOC Value. The ZOC for a hex is expressed as a value. This value is equal to the stacking size of all friendly units located in – or adjacent to – the hex in question. This value will be adjusted if the following conditions apply:

- Friendly Conscript ground units exert a ZOC Value equal to their stacking size minus one (-1).
- Friendly Elite units exert a ZOC Value equal to their stacking size plus one (+1).
- Encircled/Isolated units have their ZOC Value reduced by 1.

NOTE: A Friendly Conscript unit with a stacking size of one has no ZOC.

ZOC VALUE DISPLAY

To see the ZOC values of a hex, press **Hotkey-K** to display the Hex Details Popup.

For the selected hex, the pane shows the Axis ZOC Value on the left of the colon, and the Allies ZOC Value on the right. If a unit occupies a Hex, then it will show a dash "-" for that side.

ZOCs can also be shown on the game map by pressing **Hotkey-Z**. Press once and it will show the Axis ZOCs. Press a second time and it will display the Allies ZOCs.

On the game map, ZOCs are shown in a range of colors from yellow (low ZOC Values) to orange (mid-range ZOC Values) to red (high ZOC Values).

MOVEMENT POINT COSTS

A hex's ZOC value is the cost in additional Move Points that an enemy unit must expend to enter that hex. For example, if a hex has a ZOC Value of 4, then it will cost an enemy unit 4 Move Points to enter that hex plus the cost of terrain. The maximum cost to enter a hex in an enemy ZOC (EZOC) equals the cost of the terrain plus 10 MPs. If the hex in question is occupied by a stationary friendly unit then the only cost to enter the hex is that of the terrain alone – i.e. the EZOC cost is 0.

MOVEMENT POINT ADJUSTMENTS

The Move Point costs dictated by the ZOC Value of a hex are adjusted based on the Quality of the unit exiting the enemy ZOC. Move Point costs are adjusted as follows:

- Elite Quality: -2
- Veteran Quality: -1
- Regular Quality: 0
- Green & Conscript Quality: +2

- Recce: -2**
  ** If you wish to have a recce unit enter an enemy ZOC you must use the *Move and Attack* order.

For example, if a hex has an enemy ZOC Value of 4, to enter the hex it will cost:

- Elite Quality Units: 2 Move Points (4 minus 2)
- Veteran Quality Units: 3 Move Points (4 minus 1)
- Regular Quality Units: 4 Move Points (4 minus 0)
- Green & Conscript Quality Units: 6 Move Points (4 plus 2)
- Elite Recce Unit: 0 Move Points (4 minus 2 minus 2)

Note that:

- A unit moving with *Road Movement* will stop on entering an enemy ZOC and will be ambushed.
- Regardless of the enemy ZOC Values, a unit can always move one (1) hex.
- A unit can move from one enemy ZOC to another as long as it has sufficient movement points to do so.
- A unit can move from the ZOC of one enemy unit into the ZOC of a different enemy unit.
- A unit cannot usually move from the ZOC of a unit into the ZOC of the same unit (i.e. a unit cannot move across an enemy unit front, it can only move away from that unit – an exception to this rule is that a Conscript unit with a stacking size of 1 will have a ZOC

of 0, which means it has no ZOC and therefore units CAN move across its front.).

MOVING UNITS

"The main navigation was carried out by the regimental Navigator, who remained out of any action but closely plotting the movement of the Regiment, which, once engaged, would quickly become disoriented as these early battles tended to emulate Naval actions with tanks milling around all over the place, raising minor sandstorms."

– R. Godwin, H Squadron,
2nd Royal Gloucestershire Hussars

Units can be dragged to their destination (**Dest**) by using the Left-Mouse button. If multiple units in a stack have been selected (see Selecting Units below), then all selected are moved together. Invalid destination hexes are shaded. Invalid destination hexes are hexes where the selected unit or stack of units does not have sufficient movement points to reach. Hexes that would be accessible if not for the presence of enemy units are yellow.

Pressing the **ALT** key and then dragging a unit allows that unit to plot its moves while ignoring the presence of enemy units. Otherwise the unit's moves will automatically be plotted to move around hexes occupied by enemy units.

Waypoints. You can drag-drop a unit multiple times when giving movement orders; this allows you set "waypoints" for the units to follow enroute to its destination.

GENERAL MOVEMENT TYPE

The **General Movement Type** is the type of movement a unit will try to use when selected.

There are 3 Movement Types:

Move and Attack

Move and Defend

Road Movement

Units can only use one Movement type per turn (one cannot use *Move and Defend* for half the move, and then *Road Movement*). To change the **General Movement Type**, press the Movement Button or **Hotkey-M**.

For example, if the **General Movement Type** is *Road Movement*, then when selecting a unit, it will try to use *Road Movement*. If however, the unit cannot use *Road Movement* (e.g. if it already used a different move type or is adjacent to an enemy unit, or does not have Move+ supply) then it will use another Move type instead.

MOVE AND ATTACK

Units using the *Move and Attack* order will move and attack any enemy unit blocking its path to to its destination hex. They will attempt to overrun before they attack.

An attack will involve all units trying to move into the enemy hex at exactly the same time. Hence, units moving together as a stack will attack together. Units moving one after another may end up attacking one after another.

Defending units may be attacked multiple times if units using *Move and Attack* arrive at different times during a move phase.

Defending Artillery / Air attacks will be used in every battle. Attacking Artillery / Air attacks do not occur in *Move and Attack* battles.

Move and Attack battles are resolved as a normal battle, except they have a lower intensity. Intensity is reduced by one level; i.e. what would be a High Intensity planned battle will be a Medium Intensity *Move and Attack* battle (see Battle Intensity). This is deliberate as an attack should be less organized and intense if it's happening on the move.

As with Move and Defend, the minimum movement point cost to enter a hex is one.

MOVE AND DEFEND

Units using *Move and Defend* move and stop if they encounter enemy units. They will attempt to overrun if they have the odds but will not attack.

If the enemy unit blocking its path moves, the friendly unit will continue to move, though it may not move its full move allowance.

These units do not use *Road Movement* value (i.e. road costs that are less than 1 MP). The minimum movement cost to enter a hex will be 1. Note that the roads still have a benefit; if entering a hex normally costs 2 Move Points to enter, then if a unit enters it along a road, the cost will only be 1.

In a single turn, you cannot order a unit to move to a hex and then defend with no retreat or to withdraw if attacked. It can only get those orders in the next turn, after it's in the hex.

ROAD MOVEMENT

To use Road Movement a unit must:

- have its HQ in Move+ supply.
- when selected, have the **General Movement Type** set to *Road Movement*.
- not start its turn adjacent to an enemy unit.
- not mix different move types. It must start and end its entire move using *Road Movement*.

Units using *Road Movement* have an increased number of Movement Points available. Multiply the unit's normal movement point value by the Unit Type's *Road Movement* Multiplier from the following table.

Road Movement Table	
Unit Type	**Road Movement Multiplier**
Armored	1
Infantry	.5
Recce	0.88
Mechanized	1.17
Motorized	1.4
Artillery	1.75
AntiTank	1.4

Heavy AntiTank	1.75
Combat Engineers	1.4
AntiAircraft	1.4
Heavy AntiAircraft	1.75
Headquarters	2

For example, a German Panzer battalion normally has 14 Movement Points. If it uses *Road Movement,* it will use the Armored Modifier from the *Road Movemen*t Table (i.e. x1). Therefore, 14 MPs x 1 = 14 MPs available for the Panzer battalion to conduct *Road Movement*.

Units using *Road Movement* can also use the road movement values (i.e. 0.25 for a highway and 0.5 for desert track).

If a unit using *Road Movement* enters an enemy ZOC, then the enemy unit gets a *free* attack on the moving unit – an Ambush attack. As the target of an ambush, the road-moving Defending unit will receive damage to its strength and readiness. The Attacking unit (the ambusher) receives no damage.

SELECTING UNITS

Individual Units can be selected by left-clicking on the unit counter.

Double click or press the **Hotkey-F** or double click on a stack of units to select all units in the hex. A stack of selected units can all be moved together. De-select a stack by left-clicking anywhere on the map.

When a stack of units is selected, a unit can be selected / unselected by clicking on its picture in the Unit Details pane, or by SHIFT-Right clicking the units counter on the map.

You can also cycle the bottom unit in a stack to the top by pressing **Hotkey-C**.

WAIT

The player can delay the start of a planned move for a ground unit. The Wait command can be issued by pressing **Hotkey-W**. This will cause a ground unit to wait for one (1) Movement Point before executing its move. A wait command can only be ordered if a unit has not yet moved. The Wait command can be useful in synchronizing movements of units to coordinate adhoc attacks or to give priority of movement to certain units in a cluttered area where over stacking could interfere with planned moves.

When a unit is ordered to Wait, a dark triangle will appear in the lower right of the counter.

TIP: Sometimes units don't end up where you ordered them to go. Three things could be the cause. One – they ran into the enemy before they got to the destination hex. Two – their readiness level is very low and thus subject to the Command and Control delay rules. Or three – the traffic jam.

NOTE: 11 Stacking Points (SPs) is the max for a hex but only 8 SPs in a hex will block a battalion's move (8 plus 4 = 12); 10 SPs will block a company's move (10 plus 2 = 12).

To avoid traffic jams, try to get the "big picture" of what you want to happen in a particular sector of the map. Then look to see where bottlenecks might occur given your desired moves. Move units that need to go the furthest first. Then use the W key (wait) to keep units that only have a short way to go from stopping and thus blocking a hex with their stacking points. Alternatively, plot movement paths to avoid each other by NOT using the default path identified by the computer as "the way" to get to your destination. Exercise more control where your plan is going to create a dog pile.

"...A few words on moves in Africa; if the going allows it, one travels in columns. Recce vehicles travel within sight, ahead and on the flanks, like destroyers at sea. In a group at the front the Antitank guns and the headquarters group, the artillery in the middle and the [supply and maintenance] echelons and an Antitank gun at the rear. Speed about 20-25 kph depending on the going. By night one normally travels in three columns close together, at about 5-10 kph."

– Hauptmann Wolfgang Everth, Panzeraufklärungs Abteilung 3, 21st Panzer Division

COMMAND AND CONTROL EFFECTS ON MOVEMENT

The command and control status of a unit creates a chance that it will not carry out all its planned moves. A single move event for a unit is defined as the act of leaving one hex to enter another. The Command and Control Delay Value (CCV) provides the base probability that a unit will move as

ordered. In *Desert War 1940–42*, the CCV is between -10 and -25 depending on the scenario and side.. This information is also located in the briefing for each scenario. A unit's Quality, Readiness, and Lines of Communication (LOC) status will affect this delay probability.

For example:

If at supported range:

	Quality	CCV	Readiness	LOC	Result
Elite	+60	-25	+100	+40	100%
High	+40	-25	+100	+40	100%
Medium	+20	-25	+100	+40	100%
Low	0	-25	+100	+40	100%
Conscript	-20	-25	+100	+40	95%

If at extended support range:

	Quality	CCV	Readiness	LOC	Result
Elite	+60	-25	+100	0	100%
High	+40	-25	+100	0	100%
Medium	+20	-25	+100	0	95%
Low	0	-25	+100	0	75%
Conscript	-20	-25	+100	0	55%

If isolated or encircled:

	Quality	CCV	Readiness	LOC	Result
Elite	+60	-25	+100	-40	95%
High	+40	-25	+100	-40	75%
Medium	+20	-25	+100	-40	55%
Low	0	-25	+100	-40	35%
Conscript	-20	-25	+100	-40	15%

By way of comparison, a unit at 50% readiness suffers a severe loss of command and control:

	Quality	CCV	Readiness	LOC	Result
Elite	+60	-25	+50	-40	45%
High	+40	-25	+50	-40	25%
Medium	+20	-25	+50	-40	10%
Low	0	-25	+50	-40	10%
Conscript	-20	-25	+50	-40	10%

With a CCV = -25%, a Quality rating of conscript, and a readiness of 30% then the delay results is 50%. This means there's a 50% chance a unit will be delayed by at least one move, a further 25% chance it will be delayed by more than two, etc.

If a unit is delayed due to a failed Command and Control check, this fact will be displayed during the film phase. The number shown in the clock icon represents the number of moves by which the unit was delayed.

UNIT STACK ORDERS

The player can issue defensive and offensive orders to his units. Orders apply to stacks. For the purpose of this rule, a stack is one or more units located in a hex. Orders for that hex's units can then also be changed by pressing the **Hotkey-O**. Stack Orders are displayed on the Overview Panel. They can also be displayed on top of the stacks by selecting **Hotkey Shift-O**.

OFFENSIVE ORDERS

Orders that can be set during a set-piece battle. These orders apply to all attacking units. If units attack from different hexes, all attacking units will have the same offensive orders (i.e. some units cannot have "Attack, no advance" orders while others have "Attack, normal casualties" orders.

Unless the attackers have "Attack, no advance" orders, if the defender is destroyed or retreats/withdraws, the attacker may advance into the vacated hex. If the attack was from multiple hexes, then the units in the hex with the largest attack values will advance. If, after advancing, there is room for more units, other units not in enemy ZOC will also advance.


Attack, normal intensity


Assault, increases the battle intensity by 1 level.


Attack, no advance

DEFENSIVE ORDERS

Defense order assignments apply to *all* units in the hex; you cannot assign different orders to different units in a hex.

Hold (normal defense)


Hold at all costs (take casualties instead of retreating). Higher quality units and/or units with good readiness have a greater chance of holding.


Withdraw instead of taking casualties. Higher quality units and/or units with good readiness have a greater chance of withdrawing successfully.

COMBAT

GROUND COMBAT

Combat can be planned during Planned Phase and its execution will be shown during the Film Phase.

Unlike other IGOUGO games, in a WEGO game, moving a unit onto an enemy unit does not result in an attack, it results in a *planned* attack.

A battle always occurs when units from one side try to occupy a hex containing enemy units.

There are two main types of ground attacks, set-piece or adhoc.

SET-PIECE ATTACKS

These attack are deliberate and planned in advance, and can benefit from friendly artillery, naval, and ground support. The player can also affect the intensity of a set-piece battles by changing the *Offensive Orders*.

To create a set-piece battle, drag and drop units onto adjacent enemy units.

Units attacking enemy units in a set-piece attack *will not* attempt to Overrun the enemy prior to the attack.

ADHOC ATTACKS

These attacks are unplanned.

Examples are Overruns, Ambushes, and battles resulting from units moving with *Move and Attack* orders encountering enemy units.

BATTLE TYPES

There are several different types of battles.

NORMAL BATTLE

This is a battle that results from a set-piece attack.

AMBUSH

An ambush occurs when a unit using *Road Movement* moves adjacent to an enemy unit. In an ambush, the battle is resolved as normal, but the attacker (the ambusher) takes no casualties.

MOVE BATTLE

A move Battle is one in which the moving unit(s) have Move and Attack orders. See Move and Attack.

This battle is the same as a set-piece battle except its intensity is lower, attacker artillery/naval and ground support is not included, and the units will attempt an overrun prior to attacking.

ANTI AIR ATTACK

An Anti-Air attacks occurs before air unit ground attacks. This attack may inflict damage on the air unit, may reduce its attack, or even cause the air unit to abort it mission.

MEETING ENGAGEMENTS

If unit(s) with *Move and Attack* try to move into a hex in which all of the defenders have moved,

then the resulting battle is a Meeting Engagement. All units of both sides must be moving for a meeting engagement.

A Meeting Engagement differs from a normal battle as follows:

- No terrain is taken into account in a meeting engagement. This is because both forces are trying to enter the same hex (the terrain effects are neutral, i.e. both side's terrain effects cancel each other out).
- Quality shift difference is doubled. This is because the better trained forces will always act faster than those who are less trained, and fast can equal decisive action in a Meeting Engagement.

OVERRUNS

An overrun occurs during the Move Phase whenever ground units attempt to move into a hex that is occupied by enemy units. An overrun represents an overwhelming attack where the moving units immediately attack and destroy enemy units.

This overrun icon appears on the map when an overrun occurs.

An overrun attack is not ordered. Only moving units will attempt an overrun. If moving units can perform an Overrun, it will occur. To attempt an overrun, plot one or more units' moves over an enemy unit's hex. Units engaging in a set-piece attack against a hex will not attempt an overrun

An overrun will occur if:

- The odds are greater than 10:1. The odds are calculated in the same way as for a planned battle.
- The Defender is in an Open hex (i.e. the hex itself has no defensive bonus).
- The Defender is not only Recce unit(s).

Units that can participate in an Overrun must:

- Have a Quality of Regular or higher.
- Have a Readiness of greater than 33%.
- Not use Road Movement.
- Be moving over a hex side that has no defensive bonus (e.g. units cannot conduct an overrun across a Gully hex side).

Units performing an overrun pay the following costs:

- 20% of its Movement Points to overrun (minimum cost of 1 Move Point). This is on top of the normal movement cost to enter the hex.
- 5% of its Readiness.

The effects of Artillery, Naval, and Air Ground Support are not used in an overrun attack.

All battle odds shifts are used when determining the 10:1 odds requirement for an overrun attack (e.g. Quality, Flanking, Shock shifts, etc. are taken into account to determine the final odds for the battle).

All units that are plotted to move into a hex will take part in an overrun attack.

Units moving with *Move and Defend* orders will wait until sufficient units arrive in the targeted hex to generate the 10:1 odds requirement for an overrun attack.

Units creating the 10:1 odds advantage do not have to start from the same hex nor do the units involved have to be moving into the target hex at exactly the same time in the movement sequence.

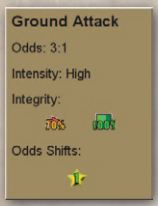
An overrun attack will occur as long as the force ratio of all moving units is 10:1 or greater, regardless of multiple hex sides of entry into the overrun hex, and regardless of multiple timings of entry into the overrun hex (e.g. if one unit with *Move and Defend* orders tries to move over an enemy unit but is too weak to conduct the overrun attack, then there will be no overrun attack. If later in the turn another unit tries to move over that same enemy unit, then both friendly units will attempt an overrun attack together). In other words, the 10:1 odds advantage does not have to come from the same hex nor at the same time in the movement sequence. As long as a force ratio of all moving units is 10:1 or greater – regardless of multiple hexsides of entry into the overrun hex – and regardless of multiple timings of entry into the overrun hex – an overrun combat will occur.

If units are ordered to set-piece attack an enemy hex, then an Overrun will not be attempted beforehand. If a unit wishes to attempt an overrun and only attack if the overrun

is not possible, then it should plot a move onto the enemy hex with *Move and Attack* orders.

BATTLE RESOLUTION

When a set-piece battle has been planned, it's basic information is displayed in the Ground Attack popup



To see the battle odds, move the cursor over the battle and the Ground Attack Popup will display.

This shows, the odds, the intensity, integrity and any odds shifts.

Note that when Fog Of War is on, these values may be incorrect.

Artillery, Air, Naval and Ground Asset's Command Ground Support can be added to the attack.

Adding support to a friendly unit will provide defensive support if this unit is attacked. If the unit is not attacked and the Artillery/Ground support is therefore unused, the Artillery/Ground Support unit will recover Readiness instead.

Ground Asset's Command and Air Ground Support change the odds of the battle. E.g. if a Ground Support of 1 is added to a 2:1 attack, then it will be resolved at 3:1.

Artillery and Naval attacks are added to the attack factors as if the unit were a ground unit. E.g. if 10 ground factors attack, then an Artillery unit with an attack of 2 will be added to the 10, giving an attack of 12.

For more information, right click the battle to open the Battle Details pop up as below.

On the top left of the popup, the basic battle data is shown, the attack's flag and the attacker's orders and the defenders flag and orders, and the odds calculation. To see more information about the Odds or Shocks Shifts, move the cursor over that text.

To the right is the basic odds panel which contains, from top to bottom, are the final attack / defense values, the integrity of each side, the raw attack / defense values, the attacker / defender artillery factors, and final the attack / defender naval factors.

To the right is the result panes for each side. These only contain information after the battle has been executed in the film phase.

The picture of any Air / Ground Asset / Naval units involved will be shown as illustrated.

Also shown is the units engaged in the battle, and the Shock values of each.

BATTLE ODDS SHIFTS

Battle odds can be shifted for the following reasons.

Quality Modifier

This difference between the average quality of the attacker versus the average quality of the defender.

The quality of a stack of units depends on the attack factors of each unit. A strong unit will influence the quality of a stack far more than a weak one.

Shock Modifier

Shock can modify battle odds in favor of the Attacker and/or the Defender. See Shock.

Flank Attack Modifier

If attacking from more than one direction, the odds are shifted by one in favor of the attacker. If attacking from the rear, the odds are shifted by two in favor of the attacker.

Ground Support Modifier

Ground Assets Command or Air Ground Support increase the odds by shifting the odds by the air asset's tactical air value. Defending air strikes reduce the odds by shift the odds similarly. See Air assets.

Combat Engineers Modifier
Applies if Combat Engineers are attacking a Town/Fort. See Combat Engineers.

BATTLE INTENSITY

The higher the intensity of a battle, the more casualties are inflicted/suffered by both sides. The higher the average Attackers Unit Quality and Readiness, the higher the Battle Intensity.

Artillery only attacks have an Low battle intensity. If there is more artillery than ground units in a battle, the intensity is also reduced.

For Meeting Engagements (*Move and Attack*) the intensity of a battle is reduced by 1.

There are 5 levels of Intensity:

- Very low
- Low
- Medium
- High
- Extreme

Players can influence the intensity of a set-piece attacks by changing its Offensive Orders.

COMBAT RESULTS

To resolve ground combat, a die is rolled by the computer and the results indexed with the final battle odds to obtain the combat result. The die roll is a number between 1 and 6.

A die roll of 1 is more favorable for the Defender. A die roll of 6 is more favorable for the Attacker.

Damage received by a combat result affects Readiness first, and then Strength. As readiness declines, the proportion of damage taken from readiness also declines. For example, if readiness is 90%, then 90% of damage will be taken from Readiness and 10% from Strength. At 50%, the half damage is taken from Readiness and half from Strength.

Press the CRT info button to see the Combat Results Charts.

DESTROYING UNITS

Higher quality ground units receive less battle damage compared to lower quality units:

- Elite Units are destroyed if readiness and strength are both < 5%.
- Veteran Units destroyed if readiness and strength are both < 10%.
- Regular Units destroyed if readiness and strength are both < 15%.
- Green Units destroyed if readiness and strength are both < 20%.
- Conscript Units destroyed if readiness and strength are both < 25%.

OVERALL BATTLE RESULTS

After the combat results have been calculated the overall result is determined. Defenders may hold their position, retreat or withdraw.

Attacks may hold their position or advance.

ADVANCE

If the defender is destroyed or retreats/withdraws, the attacker may advance into the vacated hex. If the attack was from multiple hexes, then the units in the hex with the largest attack values will advance.

If, after advancing, there is room for more units, other units not in enemy ZOC will also advance.

RETREAT

If the attacker inflicts enough damage on the defenders, they will be forced to retreat one or two hexes. The retreat result applies to all units in a hex.

A retreat is unplanned, and units retreating will suffer more casualties than those withdrawing. Units that cannot retreat receive further heavy casualties.

Units retreating/withdrawing cannot move into a hex:

- That is being attacked.
- That is adjacent to an attacker.
- That is in an enemy ZOC (unless the hex is occupied by friendly unit).

If a unit retreats, it loses all of its planned moves.

Units will retreat 2 hexes if their average post combat readiness is less than 20%.

Units *may* retreat 1 hex if their average post combat readiness is less than 40%. The chance of retreating depends on the average quality of the units, the damage inflicted during the battle, and the average readiness.

WITHDRAW

Defending units can withdraw from a battle to reduce casualties

To withdraw, the unit must have Withdraw orders. *Exception*: if all defending units are Recce units then they will automatically try to withdraw

Normally, there is a 100% chance of units withdrawing.

The difference between the attacker's quality and defenders quality can increase/decrease this by 33% per difference in quality.

If the average readiness is less than 50% then the withdraw chance is also reduced.

E.g. if an Elite unit attacks a Green unit, there is a difference in quality of 3 levels so the withdraw chace is reduced by 100% (3 * 33%) to 0.

And if a Green unit attacks an Elite unit, the withdraw chance is increased by 100% to 200%. Therefore, even a unit with very low readiness will be able to retreat if it has higher quality than its attacker.

Recce will automatically withdraw if they are the only units in a hex. Exceptions:

- Recce units will not withdraw if their orders are Hold, No Retreat
- Recce units will not withdraw if attacked by other recce, artillery, or combat engineers.
- Recce ignore the Quality influence above, and reduction to withdraw chance for units with readiness less than 50% is half of that of other types of units.

HOLD AT ALL COSTS

Defending units can Hold and take extra casualties instead of retreating.

To Hold, the unit must have Hold At All Cost orders.

The chance of Holding is depends on the quality and readiness of the units and the retreat distance. If the retreat distance is 2, the chance of holding is halved.

Holding at all costs increases casualties by 20%.

ANTI-AIRCRAFT (AA) ATTACKS

When air units attack enemy units, they are first subject to an Anti-Aircraft (AA) attack from the ground units. The air attack on the ground unit occurs after the AA attack. If enough damage is inflicted on the attacking Air Unit, the air attack will be aborted.

When an air unit attacks compare:

- the total air AA strength of all the ground units in the hex
- the Air Unit's Defense strength.

This gives the AA Attack Ratio. Then the difference in quality of the attack / defender is found. This difference shifts the odds.

If several air units attack, the AA attacks are resolved independently (i.e. the Air Unit's Defensive strengths are not combined). The combined ground AA fire attacks each air unit one at a time. Therefore, the stacking of a Green quality ground unit with a Veteran quality one will reduce the quality of the AA attack, whereas if a Green quality air unit attacking with a Veteran quality one will have no effect on the Veteran quality unit's AA defense.

For example:

- 2 attacking Air assets: one with Defense of 10 and the other with a Defense of 5
- 2 defending ground units: a Heavy Anti-Aircraft Unit (stacking size 5) and an Armor unit (stacking size 2).

Then:

- The AA strength is: Heavy AA (5 * 4) + Armor (2) = 22.
- First Air asset with Defense of 10 is attacked at odds 2:1 (22:10) and the AA attack resolved.
- Second Air asset with Defense of 5 is attacked at odds 4:1 (22:5) and the AA attack resolved.
- If any Air asset survived the AA attack, it will then attack the ground units.

See 'Anti-Aircraft (AA) Units' for more information on how AA strength is calculated.

Air defense combat is resolved before any air attacks take place in a hex; results are:

- No effect.
- Air attack halved.
- Air attack aborted.

AA attack battle details are shown as below.

Right click a Anti-Aircraft Attack hex to show the AA result details.

This will show the details of each AA attack.

Click the Air unit to show its AA attack details.

Move the cursor over the icons for further information.

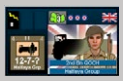
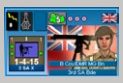
Press the CRT info button to see the Combat Results Charts.

FOG OF WAR (FOW)

When Fog of War is selected from the game options, then only certain information about enemy units can be seen, depending on the intelligence that side has on the target hex.

- Intel Level 0 = No intelligence
- Intel Level 1 = Enemy presence
- Intel Level 2 = Low
- Intel Level 3 = Medium
- Intel Level 4 = High
- Intel Level 5 = Extreme

The Intel Level is shown by the cloud icon on the Unit Details on the Info Panel.

	Unit Counter		Unit Panel	
Intel Level	**Counter**	**Data**	**Picture**	**None**
0 No info	None	None	None	None
1 Enemy Presence		Location		None
2 Low info 		Nationality Echelon Type (Type may be incorrect)		Nationality Echelon Type (Type may be incorrect)
3 Medium info 		Name Combat Values (Combat Values may be incorrect)		Name Combat Values Shock (Combat Values may be incorrect)
4 High info 		Correct Combat Values		Correct Combat Values Quality Supply Status Dug-in State
5 Maximum info 		Strength Readiness		Strength Readiness Max Combat Values

Current Intel Levels can be seen on the map by pressing **Hotkey-I**. This displays the hexes intel strength of each hex. The greener the color, the more recon strength is being exerted; the more yellow, the less. This display helps to identify the holes in your battlefield reconnaissance. You can see the exact recon strength values with the **Hotkey-K** pop up.

Intel Level 5 is only available when an enemy unit is adjacent to a friendly unit.

NOTE: To achieve Intel Level 5 intelligence it often requires an attack by friendly ground forces on the adjacent enemy.

Intel Level 2 can misidentify a unit's type, but type will be similar (e.g. A mobile unit type [Armor, Motorized, Recce, and Mechanized] may be incorrectly portrayed as another Mobile unit type. A combat engineer unit may be incorrectly identified as infantry unit (but infantry units are never misidentified). A "gun" unit type (artillery / antitank / heavy antitank) may be incorrectly identified as another "gun" unit type.

INTELLIGENCE COLLECTION

Intelligence collection has two parts:

- **Intelligence Range:** The distance in hexes that a Unit can 'see'.
- **Intelligence Strength:** The amount of information about enemy units discovered. This strength ranges from 1 (minimal information provided) to 5 (all information about enemy unit is provided).

The **Intelligence Range** and **Intelligence Strength** assigned to a unit varies based on the unit's type:

Unit Type	Intelligence Range	Intelligence Strength
Recce	4	4
Armor	3	1
Mechanized	3	2
Motorized	2	2
Infantry	1	2
Artillery	1	1
Combat Engineers	1	1
Others	1	1

Every unit gathers intelligence on the hexes around it. Adjacent hexes will provide the highest level of intelligence. Intelligence level detail decreases by 1 per hex distance (i.e. an adjacent hex may provide Intel Level 5 information, but at a distance of two hexes, the Intel Level equals four, and at a distance of three hexes, the Intel Level equals three, etc. However, the Intel Level will not be reduced to zero as long as a unit has intelligence range remaining; i.e. the Intel Level will be one.

Air Recce and Electronic Warfare (EW) assets can also gather intelligence. These assets have their own intelligence values:

Asset Type	Intelligence Range	Intelligence Strength
Intel Estimate	6	3
Air Recce	2	2
Air Recce (photo)	3	2
EW Intercept	2	4
EW Direction Finding	4	2

Ground and Air reconnaissance and EW assets will display enemy units that move through their reconnaissance zones. Enemy units that move out of a reconnaissance zone will disappear.

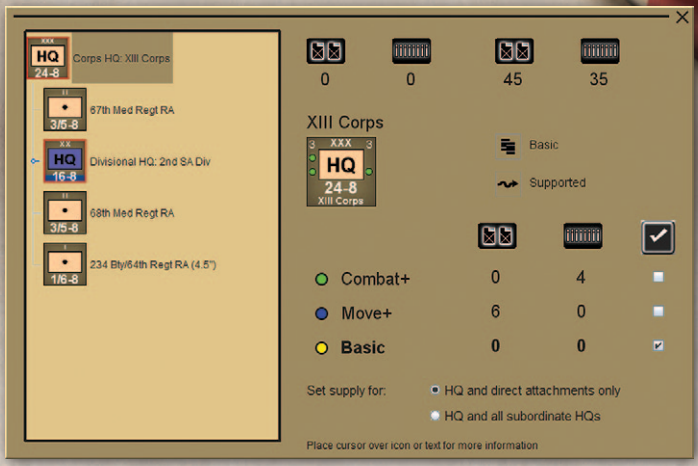
SUPPLY

Introduction. Supply in *Desert War 1940–42* is intended to be "handled by exception"; if the player is satisfied with being on the defensive he doesn't have to make any supply decisions at all. If the player wants to go on the offensive or make long distance moves, then with a few simple steps he is ready to go – "bean counting" is minimized.

Press the Supply buttons to open the Supply Allocation Panel illustrated below.

This allows the player to set the supply for HQs.

From the Supply Allocation Panel, supply can be allocated to either a single HQ or to a HQ and all its subordinate HQs. This allocates extra ammunition or fuel to that HQ.



Each turn, new supply (ammunition or fuel) arrives, though this can be reduced by enemy interdiction.

Supply is distributed from Supply Sources to HQs and from HQs to their units. The paths from the Supply Sources to the HQs and from HQs to their units are called Lines Of Communication.

Allocating this supply can increase either the effective Attack values (Combat+ supply) or the effective Movement Points (Move+ supply) of a HQ's units.

Note that once extra supply is allocated, it's a case of Use It or Lose It. I.e. if Move+ supply is allocated and no units move, then the fuel is still lost. It is therefore important to properly plan supply allocation – if a player wastes his supply, he will quickly run out and not have it when it's needed most.

The supply system in consists of these major components:

- Supply Distribution Activities
- Supply Points
- Consumers
- Lines of Communications (LOCs)
- LOC States
- Supply Allocation
- Supply Costs

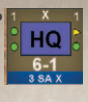
SUPPLY DISTRIBUTION ACTIVITIES

Supply Distribution Activities (SDAs) provide supply to HQs units and ground units that are within HQ range. There are currently two different SDAs in *Desert War 1940–42*:

- 

  Supply Sources. Each side – Axis and Allies – will have at least one Supply Source (sources for each side are distinguished by the hex outline color – in the example shown, the source is allied as it has a blue outline). Supply Sources are placed on the scenario map by the scenario designer. These Supply Sources are generally placed in hexes at one or more of the edges of the scenario map – though they may also be found in port cities or other locations that historically contained major supply depots; it all depends on the scenario. Supply Sources represent the numerous on-map and off-map logistics activities that exist to store and move supplies,

equipment and/or personnel to the units in the theater of operations. Generally speaking, these Supply Source activities are not managed in any way by the player; they are autonomous.

- 

Headquarters / Supply Depot Units. Headquarters / Supply Depot units are the nodes through which supplies flow to ground units. Each side will have a Root Headquarters which, in historical terms, represent the "Supreme Headquarters" or highest headquarters for each side. **Lines of Communications** (LOC) start at a Supply Source and are traced down through the levels of command from the "Supreme Headquarters" to the subordinate HQs and then to the actual combat units. Players can move most HQs units during game play to insure the highest level of support for their ground forces. NOTE: There are a few occasions where some HQs units may be fixed in place for the entire scenario or portions of it depending on the historical situation.

SUPPLY POINTS

There are two types of supply points used in *Desert War 1940–42* – Ammo and Fuel points. These supply points are maintained in two separate pools – one for ammo and one for fuel. Each side maintains its own set of supply points. Using supply points for an organization will increase its movement and/or combat capability.

SUPPLY CONSUMERS

The primary consumers of supply points are ground units. To receive supplies, HQs units must trace a LOC from a supply source through a chain of headquarters to the terminus – the ground unit.

Air, Naval, and Ground Assets do not consume supplies.

LINES OF COMMUNICATION (LOCS)

To receive supplies, a ground unit or HQs must be within the **LOC range** of its higher HQs or a friendly Supply Source. LOCs are the paths traced by HQs units from a Friendly Supply Source – through the echelons of command – to the ground combat units.

The LOC range is the number of movement points its supply trucks have when distributing supply when using *Road Movement*. These HQ LOC ranges are generally limited in size and are measured in movement points are usually:

- Army = 32 MPs
- Corps = 24 MPs
- Division = 16 MPs
- Brigade/Regiment = 8 MPs

LOCs cannot be traced through a hex containing an enemy unit or an enemy ZOC. However, LOCs can be traced through a hex containing an enemy ZOC if that hex is occupied by a friendly ground unit.

NOTE: A HQs can trace a line of communications directly to a supply source using its assigned LOC range; it does not have to trace through its higher HQs. If a ground unit is not within range of its owning HQs, but is within range of a friendly HQs, then ground unit will have Extended Support. However, a unit cannot trace a line of communications from a lower echelon HQ (e.g. a corps artillery unit cannot be supplied by a regiment HQ).

LINES OF COMMUNICATIONS (LOC) STATES

A unit's LOC states depend on the distance from its HQ/Supply source. A HQs unit and/or ground unit will always have its LOC in one of the following states:

- **Supported.** A HQs unit and/or ground unit is supported if its immediate superior HQs can trace a path to its hex that is free of enemy units and/or ZOCs, and *if the distance in hexes is less than or equal to half of the superior HQ's LOC range*. HQs and ground units drawing supply directly from a Supply Source are considered Supported – even if they are outside the Supported range of their HQs.
- **Extended Support.** A HQs unit and/or ground unit is receiving extended support if its superior HQs can trace a path to its hex that is free of enemy units and/or enemy ZOCs, and *if the distance in hexes is greater than half of the superior HQ's range*.
- **Isolated.** If a ground unit is not within LOC range of any HQs, it is considered isolated. A HQs and/or

ground unit is considered to be isolated if it is outside its higher HQs assigned LOC range. Isolated units have their shock effects halved. Isolated HQs cannot be assigned **Move+** or **Combat+** supply.

- **Encircled.** A HQs unit and/or ground unit is considered to be encircled if no supported HQs can trace a line of communications to the unit that is free of enemy units or enemy zones of control. Encircled units have their shock effects halved and lose readiness each turn. Encircled HQs cannot be assigned **Move+** or **Combat+** supply.

To display these LOC states, use the following hotkeys:

- **Hotkey-L** will display the LOC state each unit by its outline color.
- **Hotkey-R** when over a HQ, will display the HQ's LOC range.
- **Hotkey-H** will show the HQ LOC lines from the HQ to each of its units.

The color of displayed by these hotkeys illustrates the LOC state as follows:

- Green – Supported
- Yellow – Extended Support
- Red – Isolated
- Black – Encircled

For example, In the following illustration, if the Hotkey-R is pressed, when the cursor is over the 3 SA HQ, then the LOCs will be as shown. This HQ has values of 6-8, meaning its **HQ LOC range** is 6 (and its movement is 8).

Units in the green area will be **Supported**. Units in the yellow will have **Extended Support**. Units outside LOC range (i.e. no colour) will be **Isolated**. And units that could not trace a LOC to its HQ regardless of the HQ's LOC range, are **Encircled**. These LOC states are shown on the right hand side of the unit counter, as a colored circle with relevant LOC state color.

Terrain affects the LOC (the HQ's supply trucks must after all traverse that terrain). So in the example below, the 3-18-4 unit might be only 3 hexes from its HQ, but due to the ridges, it would take more than the 6 movement points of its LOC range to reach that unit from the HQ, so it is **Isolated**.

Hotkey-E was used to highlight the hexside terrain.

NOTE 1: Even if a unit is outside its HQ's LOC range, it may still be Supported / Extended Support if it can trace a LOC to either a Supply Source or to a higher HQ.

NOTE 2: Units cannot have a supply state higher than their higher HQs' supply state. For example, if a division HQs has Extended Support (i.e. it is at extended support distance from its Corp HQs) then all of its subordinate units are considered to have Extended Support – even if these subordinate units are within Supported range of their division HQs.

NOTE 3: See Readiness for the effects of the different states of supply on Readiness recovery.

SUPPLY ALLOCATION

During the Planning Phase, the player can change HQs supply levels by selecting the Supply button on the bottom left side of the screen. This will bring up the HQs Supply Display. The player can select the checkbox next to the desired supply level. Alternatively, supply levels can be changed by right clicking on a ground unit and selecting the supply button at the lower right portion of the Unit Details panel.

There are three Supply Levels: Basic, Move Plus, and Combat Plus. Each HQs in play will be at one or more of these levels at all times – the default level is the Basic Supply Level – this is automatic. At the end of every Execution Phase, the supply level for all HQs reverts to Basic Supply Level automatically.

- **Basic Supply Level.** Units subordinate to HQs at Basic Supply Level have their movement factors cut in half. There is no effect on unit attack or defense factors. No

Road Movement is allowed. Use this supply level when you wish to conserve fuel and ammo points. Generally used while on the defensive but it does allows probes and limited objective attacks/counterattacks.

- **Move Plus (Move+).** Units subordinate to HQs at **Move+** Supply Level have normal movement factors (i.e. not halved as with Basic Supply). In addition, they are allowed to use Road Movement. Units using Road Movement have increased movement capability but are subject to ambush by enemy units. Use **Move+** for long administrative moves of reinforcements or quick lateral shifts of reserves behind your own front lines.

- **Combat Plus (Combat+).** Units subordinate to HQs at Combat+ Supply Level have their attack factor doubled (x2); artillery units have their attack factor quadrupled (x4). There is no effect on defense or movement factors. Use Combat+ to help generate increased combat power at critical points on the battlefield. IMPORTANT NOTE: HQs that are isolated or encircled cannot be placed in at Combat+ Supply Level.

- **Move Plus and Combat Plus.** It is possible for a HQs to be assigned Move+ and Combat+ simultaneously.

Hotkey-S shows the Supply Level of all the player's units. The unit borders will be color coded as follows:

- Basic – Yellow unit border
- Move+ – Blue unit border
- Combat+ – Green unit border

SUPPLY COSTS

To select a supply level other than the Basic Supply Level will cost fuel or ammo points. These points have to be paid **every turn.** There are no fuel or ammo costs for being at Basic Supply Level. Costs vary based on the echelon of the HQs (from brigade/regiment up to Army level), the type of HQs (Non-motorized, motorized, etc.), and the number of stacking points subordinate to the HQs. To place HQs in Move+ and/or Combat+, the costs are as follows:

Type Regt/Bde HQs	Move+ For every 10 SPs*		Combat+ For every 10 SPs*	
	Fuel	Ammo	Ammo	Fuel
Non-Motorized HQs	1	0	0	1
Semi-Motorized HQs	4	0	0	2
Motorized HQs	2	0	0	2
Mechanized/Armored HQs	5	0	0	3
Artillery HQs	2	0	0	5
Additional Costs for Higher Headquarters:				
Division-level HQs	+3	0	+4	0
Corps-level HQs	+6	0	+8	0
Army-level HQs	+9	0	+12	0
* Round fractions up for number of SPs less than 10 SPs.				

A HQs' type is defined by the highest costing subordinate unit type directly subordinate to the HQs. For example, a HQs that has an armor unit directly subordinate to it is considered to be a mechanized/armored HQs and pays the Move+ and Combat+ supply costs for that type of HQs.

When assigning a Move+ or Combat+ supply level to an organization (a HQ plus its direct attachments or HQs and all its subordinates), the price in fuel/ammo points is calculated and decremented from the supply pools at the time of allocation; the points are actually spent when you hit the Next Phase button. The actual price paid will be for the units actually present on the map. Therefore, the stacking points for units from an organization that have not yet arrived on the map (i.e. reinforcements), units that have been withdrawn from the map, or units that have been destroyed are not counted in determining the actual supply cost for increasing a supply level.

SUPPLY COMBAT MODIFIERS

The attack and defense factors of ground units are modified based on their level of supply. The following table lists the various multipliers:

Attack/Defense Factor Multipliers		
LOC State	**Basic Supply Level & Move+ Supply Level Multipliers**	**Combat+ Supply Level Multipliers (All minus.../Artillery)**
Supported	100%	200% / 400%
Extended Support	75%	100% / 200%
Isolated/Encircled	50%	50% / 100%

ISOLATED / ENCIRCLED HQS

HQs that are isolated or encircled cannot be placed in at **Combat+** or **Move+** Supply. These HQs can only have Basic Supply.

ELIMINATED HQS

When a HQ unit is eliminated in combat, the following penalties are suffered by the HQ's subordinate units:

- Units that were subordinate to an eliminated HQ will now receive their supply from the next higher HQ.
- The Supply Level will have a maximum value of Extended Support.
- The Supply State cannot be changed from Basic Supply Level.
- Units suffer a reduction in Quality of one level.

SUPPLY INTERDICTION

Open Turn Information to see the effects of enemy interdiction.

See Counter-Air Results for more information.

VICTORY

The winner is the side which has most Victory Points at the end of the game. Victory Points (VPs) are awarded for destroying enemy ground units and occupying a victory point location. No victory points are awarded for damaged ground units. No points are awarded Air, Naval, or Ground Assets. The only way to achieve a draw is if both sides attain the same final score.

DESTROYING ENEMY UNITS

	Conscript	Low	Medium	High	Elite
Armor	3	4	5	6	7
Infantry	1	2	3	4	5
Recce	3	4	5	6	7
Mechanized	2	3	4	5	6
Motorized	2	3	4	5	6
Artillery	1	2	3	4	5
AntiTank	0	1	2	3	4
Heavy AntiTank	2	3	4	5	6
Combat Engineers	3	4	5	6	7
AntiAircraft	0	1	2	3	4
Heavy AntiAircraft	2	3	4	5	6
Headquarters	6	8	10	12	14

Points award depend on unit type and unit quality. For example, armor and mechanized units are worth more than infantry etc. Elite units are worth more than conscript units, etc. Victory Points for destroying ground units are awarded at the time the unit is destroyed.

CAPTURING VICTORY LOCATIONS

VPs are earned per turn. If a Location is worth 1 VP, then 1 VP will be awarded to the owner per turn.

Locations can be worth different amounts per side. For example, a location may be worth 2 VPs per turn for the Axis, but only 1 VP per turn for the Allies. Victory Points for a location maybe awarded to one side and not the other.

Press this button on the Left Toolbar to view victory data.

See Victory Details Panel for more information.

SCENARIO DEVELOPERS GUIDE

INTRODUCTION

Desert War 1940-43 comes with a full game editor. Everything you need to modify existing scenarios or create additional North Africa scenarios is included – Map Editor, Unit Editors, etc. You can set scenario conditions, set-up zones, victory locations, and more. Using the editor, the scenario designer can change the time scale, distance scale, unit scale, and all the values assigned to land, sea and air assets. All the graphics can be modified/replaced using your favorite paint/photo editing program – with a little skill, you can make the game look the way you want. The Desert War AI uses a simple "if this then that..." scripting language that allows an able operator to create a viable opponent.

GAME SCALES

General. There are no standard game scales; these decisions are left up to the scenario designer. Some of these scale decisions are set using the game editor; others are invented and implemented by the scenario designer. It is truly open to your imagination.

Maps. The editor allows you to make a map as large as 600 by 300 hexes. The map tiles included in the game were designed to support scenarios based on an arid, desert climate. The editor includes a self-contained, tile-based, map-building capability. It also can also support the import of user created-map image files.

Ground Scales. Each hexagon (hex) in Desert War is about two miles or 3.2 kilometers across — but this is not hard coded. Larger or smaller distance scales are possible and can be explored using the game editor. Do you want one mile per hex? 10 miles? You decide — you design. As there are no game mechanisms to adequately represent tactical-level, direct fire engagements, it is recommended that the ground scale be equal to or greater than 1 mile (1600 meters) per hex.

Time Scales. Game turns can be set to three turns per day, or a single day, week, month, or a year. If the three turns per day option is selected, the first two turns represent six hours of daylight; the third turn of every day is the night turn and is 12-hours long.

Unit Scales. The game pieces in *Desert War 1940-43* represent land, air, and naval forces. Land units can range in size from platoon to army level. Air assets are generally squadrons with a few detachments on occasion. Naval assets represent individual ships — generally these are destroyers, light cruisers, and cruisers of the Royal Navy. You can change this.

DESIGN SEQUENCE

General. The following design sequence is recommended for beginners. As you become more experienced with the game editor, you will see that you can skip around and proceed in a manner best suited to your own way of thinking and scenario development.

RESEARCH:

- Decide on the scenario subject. Start small. There are a lot of small engagements in North Africa that would provide a good vehicle for learning how to use the editor. Here are some suggestions for some easy starters:
  - 2nd Battle of Mechili – 6 April 1941
  - Assault on Ras el Medauar – 16 April 1941
  - Assault on Tobruk – 30 April 1941
  - Operation Brevity – 15 May 1941
  - Operation Skorpion – 27 May 1941
- Obtain relevant order of battle information for land, sea, and air:
  - Determine types of equipment (tanks, artillery, aircraft, ships, etc.).
  - Estimate strengths, readiness, quality, and dispositions.
  - Determine reinforcements and arrival locations.
- Determine operational objectives of both sides. What is an attacker trying to achieve? Destroy an enemy force? Occupy ground? What is the defender defending?
- Obtain an adequate map of area of operations. The University of Texas' Perry-Castañeda Library Map Collection: Army Map Service Topographic Map Series

is a good place to start. Here's a link: https://legacy.lib.utexas.edu/maps/ams/

- Now open the Desert War Editor. Look around. Open the tutorial scenario (2nd Battle of Bardia); you know how that plays on the outside... see what it looks like under the hood. Study each Tab. Get a feel for what's there and guess how stuff on one tab relates to stuff on another. Click on the buttons – see what happens.

CREATE:

- Create Scenario Map. There are two methods for creating a scenario map. Use the North Africa TileMaps found in the editorMaps folder of the My Games/DesertWar game directory or – create your own.
  - Use North Africa TileMaps. To extract a portion of one of these maps for your scenario, open the desired map using the editor.
- Determine the hex coordinate of the upper left hex of the map you wish to create.
  - Determine the width and height dimensions of your sub-map in hexes.
  - Now select File/Save sub-section of map and fill in the requested data – to include the title of your new scenario.
  - Close the North Africa TileMap, open your new scenario file and proceed to entering your General Game Data.

- Create Your Own Maps – a way. Let's say we want to make a map of Sicily at 2 miles per hex.
    - Obtain a period map of Sicily circa 1943 at a scale of 1:100,000 or 1:250,000. This may require putting several map sheets together using photo-editing software. Cut out the portion of the map that represents the area of operations for your scenario. For Sicily, we'll use the entire island plus a small portion of the Italian mainland in the vicinity of Messina – 196 miles wide, 130 miles high.
    - Convert the mile dimensions into hex dimensions. Divide the map width by 2 to obtain the X axis. Obtain the Y axis by dividing the map height by 2 and multiply the result by 1.3. In the Sicily example, divide 196 miles by 2 equals 98 hexes wide. Divide 130 miles by 2 equals 65; multiply 65 by 1.3 equals 75 hexes high.
    - Using the Map Tab of the editor, set the map dimensions of your map in hexes (as derived above).
    - Load Sicily map image file using Map Tab and set Imported Map Transparency to ~50% so the map is just visible. This map is used as a guide for plotting the map tiles.
    - Input terrain types, hex contents, roads and hexside data by selecting the terrain type and right clicking on the appropriate hex. Undo mistakes by pressing Ctrl-Z.

- Input the supply source location(s) for both sides. Each has its own supply icon (oil drum).
- You are done.
- If you want to enhance the tile-based map you have created, export the map (hex grid/hex coordinates off) and tweak it in a photo editing program. To accomplish this, select File/Export full map image. When you are through, import the tweaked map image using the Map Tab and select the Use this Map in Game Scenario box.

- Input General Game Data.
  - Set Default Starting Side. In most cases this should be the side that is attacking and/or had the initiative historically.
  - Set Number of Turns. Enter 1 to 999 game turns. Scenarios over 42 turns long (3 weeks) are not recommended; a replacement system has not yet been implemented.
  - Set Length of Turn. Turn length options range between Day, Week, Month, or Year.
  - Set Turns per Day. If the selected Length of Turn was “Day” then the day can be further sub-divided into two or three turns per day.
  - Set Start Date. Select day, month and year; the year must be between 1940-1943.

- Input Side Names. There are only two sides possible. Axis and Allies are good name choices.
- Input Side Colors. Red and Blue are the traditional NATO colors for depicting opposing forces but you are free to select any color you choose.
- Set Starting Levels of Fuel and Ammo. To determine start levels, open the scenario in Hotseat mode (after the ground orders of battle have been set up on the map). For each side, open the Supply Allocation Panel, navigate to the highest HQs (RootHQ). Set the radio button to "HQs and all subordinate units". Record the amount of Fuel and Ammo points displayed for Move+ and Combat+. These numbers equal one basic load of fuel and ammo. Multiply these numbers by two or three to get the starting levels. Actual multiplier used is based on a subjective assessment of the historical logistical posture of both sides.
- Set Fuel and Ammo Increase per Turn. Each side should receive a basic load of fuel and ammo every two to three days (six to 9 turns). Divide the basic load numbers as derived above by six or 9 to determine the increase per turn.
- Set Fuel and Ammo Variable%. Set this from 0 to 50% (or higher). Actual multiplier used is based on a subjective assessment of the historical logistical posture of both sides.

Note: It is best to wait until the scenario has been completed before determining Fuel and Ammo quantities (i.e. map complete, orders of battle finished, and units placed on the map).

- Set Base Counter Value for both sides (0-5). This is a subjective assessment of the balance of counterair capability of both sides. As a rule of thumb, if both sides are about equal enter zero. If one side has a slight advantage, enter 1 for that side and 0 for the other. If one side has a major advantage – enter 2, 3 or 4 for that side and 0 for the other. If one side enjoys air supremacy, enter 5 for that side and 0 for the other.
- Set Scenario Stacking Limits (1-100). Make a subjective determination of the number of stacking points assigned to each echelon of command. Determine. Determine the maximum stacking points that can be in a hex at anyone time. Remember that the costs to move through an enemy zone of control (EZOC) are determined by the number of stacking points exerting the EZOC. For example, a friendly unit attempting to move from one EZOC to another pays the cost of terrain plus the number of enemy stacking points exerting an EZOC into the hex. If the friendly unit has a movement factor of 10 and there are 10 enemy stacking points exerting EZOCs into the destination hex, the friendly unit cannot move into the hex.

- Set Fog of War Settings. These are based on the subjective assessment of each sides ability to conduct reconnaissance operations. Set Intel from 1-5 based on a sides ability to cut through the fog of war; the higher the better. Set Range for how far away from friendly units intel can be collected; the higher the better.
- Set Road Movement Values. This a multiplier of the basic movement factor of ground units. If highway and track tiles are used on your scenario then this multiplier will probably be 1 or less. If highway and track tiles are not used, then the multiplier will be greater than 1. For example, in a game with a hex scale of 20 miles per hex, it is easy to assume it contains some sort of road network. You can take advantage of this "invisible" road network by using a multiplier greater than one.

- Set Command and Control Delay Value (CCV). The is a subjective value assigned by the scenario designer; positive numbers minimize the impact of Command and Control on the game – negative numbers better replicate reality. The lower the CCV, the more likely there will be command and control problems.
- Create Army Units. Using the Army Table Tab, create the order of battle for each side. Each side has its own army table (select Side0 or Side1)
  - Open existing scenarios to study how these tables were filled out.

- Army tables can be created using the editor, or they can be created externally using any spreadsheet program and saved as a .csv file. Import/export the tables as necessary to complete their construction.
- It's recommended that you create all your HQ units first; use the HQ Tab to establish the chain of command hierarchy. Right click on the HQ icons to cut, paste, insert HQ units. The RootHQ is always the highest HQ for a side. RootHQ can be re-named as the scenario designer see fit (e.g. DAK, 8th Army, etc.).
- All unit Names must be unique (first column of the Army Tab).
- Use existing combat, movement, or quality factors from other scenarios or modify/create your own.
- Use Set-up 0 for all units until actual set-up zone have been created (see below).
- Rules of thumb for strength and readiness – use 100% for both sides unless there is complete and compelling data that suggests the scenario designer should do otherwise. In other words, if the data doesn't exist for the majority, don't penalize the few units that do have historical data. In the end, use your best judgement.

- Designate set-up areas for ground units using the Setup Tab. It is recommended that you use set-up area 0 to represent the entire area owned by a side at the

start of the scenario. This facilitates rapid placement of units to their initial start positions. If you wish to restrict the player's ability to re-position his units at the start of the game, then create additional smaller set-up areas to achieve that purpose.

- Place Army Units on Map. If you used 0 as the set-up area for your ground units and you created Set-up Area 0, then when you click the Setup Tab – all units for that side will placed randomly in that area. Drag and drop units into their initial start positions; this will populate the x,y locations in the Army Tab.
- Create Air Assets. Open existing scenarios to study how these assets are defined.
- Create Naval Assets. Open existing scenarios to study how these assets are defined.
- Create Ground Assets. Open existing scenarios to study how these assets are defined.
- Input Victory Location names and victory points awarded using Victory Tab.
- Input Scenario Briefing.
- Prepare AI Scripts for one or both sides for human vs AI scenarios; none are required for head-to-head/ Hotseat scenarios.

PLAYTEST:

- If you have scripted the AI for both sides in a scenario, run it in AI vs AI mode to see what happens. Make adjustments as necessary.
- If your scenario is intended to be head-to-head/ Hotseat only, try playing both sides solitaire a couple times. Make adjustments as necessary and then give it a try with a friend on-line or Hotseat.
- Blind test next. Share the scenario with the Desert War community. Get their input, adjust as necessary.
- Have fun!

AI SCRIPTING

AI SCRIPTING OVERVIEW

The AI is scripted. This means the AI actions are (mostly) controlled by a list of responses to Triggers (events).

The intent of this AI scripting system is to allow the scenario designer to examine the specific situation involved with a specific historical scenario (mission, enemy, terrain, friendly troops available and length of time involved, etc.) and based on that analysis, script courses of action in response to potential enemy courses of action.

Each script consists of three parts: **Script data**, a **Trigger** and a **Response**.

- **Script data** is data describing this script, like its ID

- A **Trigger** is an optional **Test** that (if it passes) initiates a **Response**.
- A **Response** is an task / action of some sort.

For example (in English):

If the Axis occupy hex (50,50), then Attack hex (50,50) with the 7th Armoured Division.

I.e. if the Trigger Test true, then do Response.

The Test is checking if the Axis occupy a Trigger Hex (50,50), the Response Task is to Attack, the Response Hex is (50,50), and the Response Units is the 7th Armoured. In this case the Trigger Hex and the Response Hex are the same, but they can be different.

Note that a **Trigger Test** is optional. If none exists, the script will always run (priority and units availability permitting).

On the first AI turn, the following occurs:

- all the AI's **Triggers** are tested, and if its test passes, then that script's **Response** is triggered
- a list of all triggered **Responses** is created
- the triggered **Responses** are put in priority order, highest priority first
- each triggered **Response** is then executed *IF units are available*
- units *consumed* by the triggered **Response** are removed from the units available

- points 4 and 5 repeat until there are no triggered **Responses** remaining, or no units available.
- the list of *ongoing Responses* (i.e. those responses that were executed this turn) is saved for next turn

On subsequent turns, the procedure is slightly different, as *ongoing Responses* remain triggered until the **Response** completes. To use the example above, if *7th Armoured was ordered to attack hex (50,50)* then it will continue to do so until it captures hex (50,50) even if this takes multiple turns.

There is an exception to this however. On a new turn, if a new higher priority **Response** is triggered (that consumes the *ongoing Response*'s units), then this would take priority over the *ongoing Response* which could then be cancelled. In a later turn, that **Response** could of course be triggered again if it passes its **Trigger Test**.

The following unscripted actions also occur each turn:

- AI units will attack adjacent enemies if they can get odds greater than 3:1. These attacks may occur even if the units have Defend orders.
- Unused artillery / Ground Assets / Air units may conduct attacks (either by assisting ground attacks or by launching standalone air/artillery attacks).
- HQs will try and reposition themselves to bring units into supported supply range, or to retreat from danger.

RESPONSE CONSUMING UNITS

Some Responses *consume* unit(s). What this means is that the unit(s) are used and no longer available for subsequent Responses.

For example, if a Response ordered the 7th Armoured to Attack hex 50,50 then the 7th Armoured would no longer be available for another (lower priority) Response to (for example) attack a different hex.

Some responses however *do not consume* units. For example, setting supply levels do not consume units, so that those units are still available for subsequent responses.

Therefore the following Responses would both execute (if triggered of course):

- Set 7th Armoured supply to Combat+ (does not consume units)
- 7th Armoured to attack hex 50,50 (consumes units)

Note that Responses that do not consume units are executed before those that do.

See chapter on **Response Task Required Attributes** for details on which Responses consume units.

SCRIPT PRIORITY

Script Responses are executed in their priority order (i.e. highest priority execute first).

Each Script has a priority attribute. The lower this number, the higher its priority (i.e. scripts with Priority 1 will run before Priority 2).

Scripts with equal priority execute in the script Id order. I.e. first, script 1 will execute, then script 2, then script 3 etc.

MANDATORY ATTRIBUTES

Some **Triggers** and **Responses** require other attributes to also exist. For example, if a Response consists of ordering a unit to move to a specific response hex, then a response hex is required by that response.

See **Trigger Test Required Attributes** and **Response Task Required Attributes** chapters for more information.

LOGGING

To assist the scenario designer, all AI actions, choices, and script errors are written to the *game.log* in the My Games/DesertWar directory.

For example, if a script's required information is not present, then an error will be shown in the *game.log*.

SCRIPT DATA

ID

This identifies the script. Scripts can reference other scripts using this ID. See **Next Id** and **Alt Id**.

PRIORITY

See chapter on **Script Priority** above. This attribute is optional.

NEXT ID

This is the ID of another script. When this script's Response is complete, the **Next Id** script will run immediately.

If the referenced alternative script should only be used when referenced by an **Alt Id** then it should have a **Trigger Type** of REF_SCRIPT_ONLY. This means the script will *never* be triggered and will only run when referenced by another script.

For example, using 3 scripts links by **Next Id**, a unit could be ordered to move to hex A, then to hex B, then to hex C. The second 2 scripts (move to hex B, and move to hex C) would then have **Trigger Type** of REF_SCRIPT_ONLY.

This attribute is optional.

MAX RUN

This is the number of times this script will run. If the Response completes, then this is reduced by 1.

Therefore, scripts with **Max Run** of 1 will only execute once.

If **Max Run** is 0, then it will never execute. If a script is required to run every turn, then **Max Run** should be set to number exceeding the number of turns in the scenario.

RND#

This is the random chance that this script Response will execute. If the check fails, the script is ignored (for this turn) and the units that would have been consumed by this script's Response remain available.

The **Rnd#** is only checked after the script's Response has been triggered (i.e. after it's Trigger Test has passed).

Rnd# is a number between 0-10.

For example, if **Rnd#** = 1, then there's a 10% chance this script's Response will execute. **Rnd#** = 7 means there's a 70% chance this script's Response will execute.

Rnd# can also be used in conjunction with **Alt Id**. See below.

This attribute is optional.

ALT ID

This defines an Alternative Script ID that will run if the **Rnd#** test above fails.

This is only used in conjunction with **Rnd#**.

If the **Rnd#** check fails and **Alt Id** exists, then the Alternative script's Response will execute.

Note: the Alt Id script's Response will execute regardless of the Alt Id's trigger test.

For example, if an **Alt Id** exists and if **Rnd#** = 1, then there's a 10% chance the current script's Response will execute, and there's a 90% change the alternative script's Response will execute.

If the referenced alternative script should only be used when referenced by an **Alt Id** then it should have a **Trigger Type** of REF_SCRIPT_ONLY. This means the script will *only* run when referenced by another script. This attribute is optional.

NOTE

This is only used by the scenario creator. The Script itself ignores this attribute. This attribute is optional.

TRIGGER

A **Trigger** is a **Test** that (if it passes) initiates a **Response**.

A Trigger is optional. If there is no Trigger, then the script will always attempt to run (Priority and unit availability permitting).

Multiple Triggers can be used in the same script. For example, a Trigger could be a combination of two Triggers: "*If it is Turn 2 and the Axis occupy hex 50,50 then ...*"

If a Trigger Tests exists, then it is mandatory to have **Trig Unit** or **Trig Org** specified.

TRIG TURN

This is the Trigger Turn.

This Test passes if **Trig Turn** is equal to the current turn. This attribute is optional.

TRIG UNIT

This is the unit that will be used by the Trigger Test.

This can either be a specific unit of either side, or can be ANY_SIDE0 or ANY_SIDE1.

ANY_SIDE0 means that the Trigger Test will be tested against any side 0 (i.e. Axis) unit.

TRIG ORG

This is the Organization (i.e. a HQ unit) that will be used by the Trigger Test.

This can either be a specific organisation of either side, or can be ANY_SIDE0 or ANY_SIDE1.

ANY_SIDE0 means that the Trigger Test will be tested against any side 0 (i.e. Axis) organisation.

If **Trig Org** specifies a HQ unit, then the Trigger Test will be tested against any unit in that HQ's Organization (i.e. if **Trig Org** is 7th Armoured, then the Trigger Test will be tested against any 7th Armoured unit).

TRIG TYPE

This is the unit Type (e.g. Armored unit) that will be used by the Trigger Test.

For example, this could be used in conjunction with Trig Unit / Org to test against any Axis Armoured unit. This attribute is optional.

TRIG AREA

This is only used in conjunction with the Trigger Test INAREA / NOT_INAREA.

Trig Area is an integer which identifies an area of the map. To create a trigger area, go to the Setup Tab, and for *Side* selected AI, then any *Setup Zone* created under *Side*=AI can be used as a Trigger Area.

This attribute is optional / mandatory depending on the Trigger Test.

TRIG TEST

This is the Trigger Test. If this Test passes then the Response was be executed.

See Trigger Test chapter.

This attribute is optional.

TRIG HEX X / TRIG HEX Y

This is the x,y coordinates of a **Trigger Hex**.

This is only used in conjunction with the Trigger Test INHEX / ISADJACENT. See **Trigger Tests**.

This attribute is optional / mandatory depending on the Trigger Test.

DELAY

If a script's Trigger Test passes, then the Response will only be executed after **Delay** number of turns.

A delayed Response does not consume units. They are still available for another Response Task.

This attribute is optional.

RESPONSE

A **Response** is an action of some sort.

RESP UNIT

This is the response unit.

This is single Naval Unit, Air Unit, Ground Unit, or Ground Asset that will carry out the Response.

This attribute is optional / mandatory depending on the **Response Task**.

RESP ORG

This is the response organization (i.e. HQ). This is the ground unit organization that will carry out the Response.

For example, if the Resp Org is 7th Armoured Division HQ then all the units under this HQ will carry out this response.

This attribute is optional / mandatory depending on the Response Task.

RESPONSE TASK

This is the task / action that will be carried out by this Response. See Response Task chapter. This attribute is mandatory.

RESP HEX X / TRIG RESP Y

This is the x, y coordinates of a **Response Hex**.

This is used in conjunction with a Response Task. If for example, the Response Task was ATTACK, then Resp Hex x, y are the coordinates of the hex to be attacked.

This attribute is optional / mandatory depending on the Response Task.

TRIGGER TESTS

This chapter contains the types of tests used to determine whether a Response will be executed.

A Trigger Test is optional. If no Trigger Test is present, then the related script Response will always execute (priority and unit availability permitting). If a Trigger Test is present, then the script Response will only execute if the test passes.

All Trigger Tests require *Trigger Units* to be specified using **Trig Unit** and / or **Trig Org**. If both **Trig Unit** and **Trig Org** are specified then the *Trigger Units* consist of a combination of **Trig Unit** and all in the units in the **Trig Org**.

REF_SCRIPT_ONLY

REF_SCRIPT_ONLY scripts will *never* be triggered independently.

They will only run if referenced from a another script (referenced by its **Next Id** or **Alt Id** field).

INHEX

This tests if any **Trigger Units** are in a specified hex.

This test passes if any **Trigger Unit** enters *or passes through* the **Trigger Hex**. I.e. this test will pass if a **Trigger Unit** even moves through the **Trigger Hex**, but does not finish its turn on the **Trigger Hex**.

A **Trigger Hex** is mandatory for INHEX.

ISADJACENT

This tests if any **Trigger Units** are in / or adjacent to a specified hex.

This is similar to INHEX, except the **Trigger Hex** and all adjacent Hexes are checked. A **Trigger Hex** is mandatory for INHEX.

INAREA

This tests if any **Trigger Units** are in an specific map area.

This test passes if any **Trigger Unit** enters or passes through the **Trigger Area**. See **Trig Area**. A **Trig Area** is mandatory for INHEX.

NOT_INAREA

This tests if **Trigger Units** are not in an specific map area.

This test passes if NO **Trigger Unit** is in the **Trigger Area**. See **Trig Area**.

A **Trig Area** is mandatory for INHEX.

READINESS

This tests the average Readiness of the **Trigger Units** is *less than* a specified value.

There are 5 different READINESS tests, from READINESS20 to READINESS100.

This test passes if the average readiness of the **Trigher Units** is *less than* the the readiness trigger value (the trigger value of READINESS20 is 20).

For example, if **Trig Org** is *7th Armoured* and **Trig Test** = READINESS40, then this test will pass (and the Response execute) is the average readiness of all units in the 7th Armoured are *less than* 40%.

STRENGTH

This tests the average Strength of the **Trigger Units** is *less than* a specified value.

There are 5 different STRENGTHtests, from STRENGTH20 to STRENGTH100.

This Trigger Test works in the same was as READINESS, except the average unit strength is tested instead of the average readiness.

LOC

This tests the average LOC (Lines Of Communication) state of the **Trigger Units**.

There are 4 different LOC tests: LOC_SUPPORTED, LOC_EXTENDED_SUPPORT, LOC_ISOLATED, LOC_ENCIRCLED.

This test passes if more than half of the **Trigger Units** have that specified LOC type.

TRIGGER TEST REQUIRED ATTRIBUTES

All Trigger Tests require a **Trig Unit** and / or a **Trig Org** (the combination of these become the *Trigger Units*).

The Trigger Tests can have a **Trig Unit** / **Org** of ANY_SIDE are indicated below.

Some Trigger Tests require other Trigger attributes to be defined as below.

Trig Test	ANY_SIDE	Trigger Units	Requires
REF_SCRIPT_ONLY	X	Y	
INHEX	Y	Y	Trig Hex
ISADJACENT	Y	Y	Trig Hex
NOT_INAREA	Y	Y	Trig Area
INAREA	Y	Y	Trig Area
READINESS100	X	Y	
READINESS80	X	Y	
READINESS60	X	Y	
READINESS40	X	Y	
READINESS20	X	Y	
LOC_SUPPORTED	X	Y	
LOC_EXTENDED_ SUPPORT	X	Y	
LOC_ISOLATED	X	Y	
LOC_ENCIRCLED	X	Y	
STRENGTH100	X	Y	
STRENGTH80	X	Y	
STRENGTH60	X	Y	
STRENGTH40	X	Y	
STRENGTH20	X	Y	

RESPONSE TASKS

This chapter contains the types of Response Tasks that a script executes when it is triggered.

All Response Tasks require *Response Units* to be specified using **Resp Unit** and / or **Resp Org**. If both **Resp Unit** and **Resp Org** are specified then the *Response Units* consist of a combination of **Resp Unit** and all in the units in the **Resp Org**. For MOVE/ATTACK orders when **Resp Org** is specified, the move path is the path from the Org's HQ to the Response Hex.

Some Response Tasks do not accept a **Resp Org**, and some require **Response Units** of a specific type. For example, the GROUNDSPT (Ground Support) Response will only accept a **Resp Unit** with a Ground Support ability.

Some Responses also require a both Response Units and target units. For example, FOLLOW orders Response Units to *follow* another unit. This other unit is specified using **Trig Unit** / **Trig Org**.

SET_BASIC_SUPPLY / SET_MOVE_PLUS_SUPPLY / SET_COMBAT_PLUS_SUPPLY

This sets the Supply for a **Resp Org**.

This sets the supply for the specified HQ *and all of its subordinate HQs.* If a subordinate HQ requires a different supply level, then that HQ should have its own separate Response. This is the reason there is a SET_BASIC_SUPPLY response type. All HQs have basic supply by default, but if a higher HQ is set to (for example) Move+ supply and

a subordinate HQ needs Basic supply, then that subordinate HQ should use SET_BASIC_SUPPLY.

This Response runs before any move or attack orders (as the supply settings will affect the unit's move points / attack strength). Move+ / Combat+ supply order settings run before Basic supply order settings.

This Response does not consume units. It can be combined with other Responses (e.g. move Responses).

ORDERS_NORMAL / ORDERS_WITHDRAWAL / ORDERS_HOLD

This is the same as a MOVE command but if the **Response Units** do not move, they have the orders specified, i.e. NORMAL / WITHDRAW or HOLD.

MOVE

Move *Response Units* to Response Hex using *Move To Defend* orders.

Moving units will not deliberately attack enemy units, *but* if they can get odds of greater than 3:1, then they will attack.

MOVE_STRATEGIC

As MOVE, but:

Unit's org has supply set to Move+

Units use road movement

ATTACK / MOVE_ATTACK

Move **Response Units** to Response Hex using *Move To Attack* orders.

Response Units will attempt to attack any enemy units that are blocking the path to the Response Hex, or if sufficient odds cannot be obtained, Response Units will be moved adjacent to the enemy unit to get the best odds for a subsequent attack (i.e. will try and surround it, occupy hexes with good defense etc).

Engineer units will attempt to breach adjacent minefields. If they have ATTACK ./ MOVE_ATTACK orders.

ATTACK_NO_ADVANCE

Same as attack, but set-piece battles will have No Advance orders.

ATTACK_ASSAULT

Same as attack, but set-piece battles will have Assault orders.

DEPLOY

Order **Response Units** to *deploy* on the specified **Response Hex**.

Deploy means the units in an Org will both occupy the Response Hex and deploy on either side of it, choosing the best defensive posture.

FOLLOW

Order **Response Units** to Follow another unit (this unit is specified using the **Trigger Unit**).

This response runs after all other responses.

Response Units follows its trigger unit, moving one hex behind it: i.e. they will move to a hex adjacent to its trigger Unit.

It will move to best defensive hex available (i.e. preferably stacking with a friendly unit or not in enemy ZOC).

FOLLOW_SUPPORT

Order **Response Units** to Follow another unit (this unit is specified using the **Trigger Unit**).

This is the same as FOLLOW, except that for artillery units, if the Response Unit did not move, then if the unit it is following (i.e. the script's Trigger Unit) is attacking the Follow unit will join in that attack. Otherwise it will defend the trigger unit.

JOIN

Order **Response Units** to move to the same hex as another unit (this unit is specified using the **Trigger Unit**)

This is like FOLLOW except the the Resp Unit JOINs the trigger unit in the same hex.

WAIT1 / WAIT2 / WAIT3 / WAIT4

This orders a unit to wait at the start of its turn (this is the same as pressing **Hotkey-W** wait when moving ones units).

WAIT1 will wait for 1 Move Point, WAIT2 will wait for 2 Move Points etc.

This Response does not consume units

GROUNDSPT

This orders a naval / artillery / air attack Ground Support mission to either:

- support friendly attack on the specified hex or assist any specified Trigger Units engaged in an attack.
- defends any friendly units on the specified hex or defend any specified Trigger Units.

The target of a GROUNDSPT order is specified with the Response Hex, Trig Unit, and/or Trig Org. One or all of these targets can be specified in the GROUNDSPT order. Note that GROUNDSPT is more likely to assist an attack than to defend.

GROUNDATK

This orders a Response Unit will attack enemy units in the Response Hex.

Air and Naval and Artillery units only.

INTERDICTION / COUNTER_AIR

This orders a Response Air Unit to conduct an Interdiction or Counter Air mission.

RECCE

This orders a Response Air Unit to conduct an a reconnaissance mission on the specified Response Hex.

RESPONSE TASK REQUIRED ATTRIBUTES

All Response Task require a **Resp Unit** and / or a **Resp Org** (the combination of these become the *Response Units*).

Some Response Task require other Response / Trigger attributes to be defined as below.

Resp Task	Resp Unit	Resp Org	Consumes	Requires
SET_BASIC_SUPPLY	X	Y	X	
SET_COMBAT_ PLUS_SUPPLY	X	Y	X	
SET_MOVE_PLUS_ SUPPLY	X	Y	X	
ORDERS_NORMAL	Y	Y	X	
ORDERS_ WITHDRAWAL	Y	Y	X	
ORDERS_HOLD	Y	Y	X	
MOVE	Y	Y		Response Hex
MOVE_STRATEGIC	Y	Y		Response Hex
MOVE_ATTACK	Y	Y		Response Hex
ATTACK	Y	Y		Response Hex
ATTACK_NO_ ADVANCE	Y	Y		Response Hex
ATTACK_ASSAULT	Y	Y		Response Hex
DEPLOY	X	Y		Response Hex
FOLLOW	Y	Y		(Friendly) Trigger Units

FOLLOW_SUPPORT	Y	Y		(Friendly) Trigger Units
JOIN	Y	Y		(Friendly) Trigger Units
WAIT1	Y	Y	X	
WAIT2	Y	Y	X	
WAIT3	Y	Y	X	
WAIT4	Y	Y	X	
GROUNDSPT	Y	X		Response Hex or (friendly) Trig Units
GROUNDATK	Y	X		Response Hex
INTERDICTION	Y	X		
COUNTER_AIR	Y	X		
RECCE	Y	X		Response Hex

APPENDICES

APPENDIX A – TERRAIN EFFECTS CHART (TEC)

Terrain Type In Hex	Movement Point Cost to Enter/Hex	Attack Effects	Defense Effects	Remarks
Desert 	1.25 MP	None	Infantry: DF x1 Armor: DF x1	
Town 	1 MP	Overrun in hex not possible		
Fort (Axis) 	Cost of Terrain	Overrun in hex not possible	Infantry: DF x2 Armor: DF x2	Only Axis units enjoy the fort effects
Fort (Allies) 	Cost of Terrain	Overrun in hex not possible	Infantry: DF x2 Armor: DF x2	Only Allies units enjoy the fort effects
Entrenchment 	Cost of Terrain	Overrun in hex not possible	Infantry: DF x1.5 Armor: DF x1.5	Only owning side benefits from entrenchment. Entrenchment is removed if occupied by an enemy force.
Groves 	2 MPs	Overrun in hex not possible	Infantry: DF x1.25	

Rough 	2 MPs	Overrun in hex not possible	Infantry: DF x1.25 Armor: DF x1.25	
Depression 	2 MPs	Overrun in hex not possible	Infantry: DF x.5 Armor: DF x.5	
Woods 	3 MPs	Overrun in hex not possible	Infantry: DF x1.5 Armor: AF & DF x.5	
Stony 	3 MPs	Overrun in hex not possible	Infantry: DF x.5 Armor: DF x.5	
Dunes 	Impassable accept when entering via highway or track	Overrun in hex not possible		
Marsh 	Impassable accept when entering via highway or track	Overrun in hex not possible		
Mountain 	4 MPs	Overrun in hex not possible	Infantry: DF x1.5 Armor: DF x.5	
Mountain Peak 	Impassable; Entry Not Possible	-	-	

Qattara 	Impassable; Entry Not Possible	-	-	
Sea 	Impassable; Entry Not Possible	-	-	
Highway 	Normal Mode: 1 MP Road Mode: .25 MP	Moving Unit Cannot Attack	Moving units subject to ambush	Road Movement use only
Track 	Normal Mode 1 MP Road Mode: .5 MP	Moving Unit Cannot Attack	Moving units subject to ambush	Road Movement use only
Wire 	+2 MPs	Overrun across hex side not possible		
Mines (Red) 	Units will stop before crossing minefield hex side	Infantry: AF x.25 Armor: AF x.25	-	Mines are neutral; they affect both sides equally. See Combat Engineers
Breached Mines (Black) 	+3 MPs	Infantry: AF x.5 Armor: AF x.5	-	Mines are neutral; they affect both sides equally. See Combat Engineers
Gully 	+2 MPs	Infantry: AF x.5 Armor: AF x.5	-	

River 	+2 MPs	Infantry: AF x.5 Armor: AF x.5	-	
Ridge 	+2 MPs	Infantry: AF x.5 Armor: AF x.5		
Escarpment 	Crossing Hex side Not Possible	No attack across hex side allowed	-	

Historical Points of Interest. Many of the image-based scenario maps often have terrain features and points of interest that are depicted for historical purposes only – they have no impact on game play. These points of interest include birs (wells), ports, airfields, border posts (BPs), etc.

APPENDIX B – ABBREVIATIONS

AA – Anti-aircraft
AC – Armored car
AF – Attack Factor
Arko – Artilleriekommandeur
Arm – Armored
Arty – Artillery
AT – Antitank
Bde – Brigade
Bn – Battalion
Bty – Battery
CG – Coldstream Guards
Co – Company

CRT – Combat Results Table
DAK – Deutsche Afrika Korps
DF – Defense Factor
DMR – Die Middellandse Regiment
EAV – Effective Attack Value
EDV – Effective Defense Value
Engr – Engineer
FOW – Fog of War
Gds – Guard
Grp – Group
ILH – Imperial Light Horse
IN – Indian
Inf – Infantry
Kaff R – Kaffrarian Rifles
KDG – King's Dragoon Guards
KG – Kampfgruppe
KRRC – King's Royal Rifle Corps
LOC – Line of Communications
MC – Motorcycle
MF – Movement Factor
MLI – Mahratta Light Infantry
Mot – Motorized
MP – Movement Point
PAA – Panzer Armee Afrika
PAI – Polizia dell'Africa Italiana (Police of Italian Africa)
PAVO – Prince Albert Victor's Own
PdiB – Provencia di Bengasi
pdr – pounder
Plt – Platoon
PzJgr – Panzerjaeger

QOCR – Queen's Own Cameron Highlanders
RA – Royal Artillery
RAF – Royal Air Force
RAAF – Royal Australian Air Force
RB – Rifle Brigade
RDLI – Royal Durban Light Infantry
Recce – Reconnaissance
Regt – Regiment
RHA – Royal Horse Artillery
RLI – Rand Light Infantry
RR – Rajputana Rifles
RTR – Royal Tank Regiment
SA – South African
SAAF – South African Air Force
SG – Scots Guards
Spt – Support
Sqdn – Squadron
Strat – Strategic
TEC – Terrain Effects Chart
Tk – Tank
Trp – Troop
UMR – Umvoti Mounted Rifles

APPENDIX C – PRONUNCIATIONS

Agedabia – AH-goo-DA-BEE-AH
Ariete (aries/"ram") – AH-ree-EH-ta
Auchinleck – AW-kin-leck
Barce – BARK
Bardia – BARD-ya
Bir Hacheim – BEER ha-KEEM

Capuzzo – ka-POOTS-sew
Derna – DARE-nah
El Agheila – EL AG-A-la
El Alamein – EL-ALLAH-MAIN
El Duda – ED-DOO-da
Gambut – GAM-boot
Halfaya – HALF-eye-ya
Mechili – meh-KILL-lee
Sidi Rezegh – see-dee RAY-zig
Recce – RECK-ee
Ridotta – ree-DOH-tah
Tobruk – TOE-brook
Trigh – TREE-guh
Wavell – WAY-vull

APPENDIX D – DESIGNER'S NOTES

"The German will not commit himself to tank versus tank battle as such. In every phase of battle he co-ordinates the action of his Antitank guns, Field Artillery and Infantry with his tanks and he will not be drawn from this policy."

– Acting Major-General William "Strafer" Gott, Commander, 7th Armored Division (Desert Rats)

"At last a decent situation map; it shows that Rommel has broken up his units in a wild pattern and conducts a campaign with very scanty forces on a widely extended front which cannot be measured by European standards."

– General Franz Halder

"The moral is to the physical as three is to one."

– Napoleon

If we can put our trust in Bonaparte for a moment, then when we discuss the physical – measurable – aspects of combat, then we are discussing the smallest fraction of the actual combat potential of a unit in *Desert War* – the "physical" that is one-quarter of the "whole".

The moral factor combined with the subjective numerical assignment of quality to intangibles like leadership and leadership development, training from the individual soldier level through squad/gun & tank crew, to platoon, company, battalion, regiment/brigade units, and on to the staffs at division, corps, and army levels; to tables of organization and the changes to them during war, and to the evolutionary aspects of doctrine (tactics, techniques, and procedures), and materiel, combat experience, morale, and most important of all – the people, their belief (or lack thereof) in the cause for fighting, their ideas of manhood – their "standards of behavior or beliefs concerning what is and is not acceptable for them to do". All these things and more bear more heavily on the outcomes of the battlefield than the calculus of the weight of a shell plus the number of soldiers in a squad divided by the climb rate of an aircraft. We are cautious about finding too much comfort in merely number-crunching the "objective" components of combat.

Deriving "accurate" attack, defense, and movement factors that are decimal perfect that we hope will reflect the realities of the battlefield is – in the end – a very subjective approach to the problem – and only a quarter of it at that (the

physical). Without access to the relevant historical data – foxhole reports of the day-to-day strengths of present for duty soldiers, mission-capable guns, tanks, aircraft, generators, wireless sets, machineguns, mortars, trucks, trailers, mechanics tool boxes with a set of three cross-tips and a quarter-inch spanner, first aid pouches, petrol, oil, lubricants, replacement widgets, wombats, and overhead redundameters, beer, razor blades, and tins of raspberry jam and utensils in the officer's mess...well then – we don't have all the relevant numbers. Nor will we ever. So let's go for "about right" and be done with it.

Our goal in *Desert War 1940–42* is to use a narrow set of subjectively selected numbers to achieve something that is "about right" – somewhere in the neighborhood of correct. Yes, we will use numbers – decimal perfect – to get to that neighborhood. Will they be good numbers? Well...if they feel "about right" to the player during game play, then we have achieved our goal – the numbers are...good enough. The people who play this game come to it with some knowledge about the War in the Desert during WWII...or...none at all. It needs to be fun for ALL (the many) and acceptable to those with deep knowledge of the subject (The Few).

And so...What if we make a mistake? Well – the game editor is very powerful and will allow others to pursue different paths to their versions of what is "about right". That's a square deal. So let the battle of the millimeters begin!

APPENDIX E – RECOMMENDED READING LIST

Alan Moorehead: *The Desert War: The classic trilogy on the North African campaign 1940-1943*

Barrie Pitt:
The Crucible of War: Wavell's Command: The Definitive History of the Desert War – Volume 1

The Crucible of War: Auchinleck's Command: The Definitive History of the Desert War – Volume 2

The Crucible of War: Montgomery and Alamein

Christopher Shores, Giovanni Massimello, Russell Guest:
A History of the Mediterranean Air War 1940-1945, Vol. 1: North Africa, June 1940-January 1942

A History of the Mediterranean Air War 1940-1945, Vol. 2: North African Desert, February 1942 – March 1943

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