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# I. INTRODUCTION

Knights of the Desert is an operational-level simulation of Rommel's campaigns in North Africa in 1942. Taking command of the Africa Korps, you will match yourself against the Allies commanded by the computer and a human opponent.

## Loading the Program

The procedure to load the game program varies with each computer and version.

### Atari Disk Version

This program requires the Atari BASIC cartridge. Turn on the disk drive, insert the disk with the label face up when the drive stops, and turn on the computer. The disk will automatically boot up.

### Atari Cassette Version

This program version also requires the Atari BASIC cartridge. Insert the Atari side of the cassette, as per the label, into the recorder and rewind it. Turn on the computer, press the recorder play button, type **CLOAD**, and press **RETURN** twice. When **READY** appears type **RUN**. Keep the play button depressed until the game is in progress and the game map is on the screen. This loading process will take several minutes.

### Apple Disk Version

Boot your game disk and the game will begin automatically. If you are using an Apple II with Pascal, you must first use your BASICS disk. If you are using an Apple III, you must first go into Apple II emulation. If you have an Apple IIe, be sure to lock your CAPS LOCK key.

### TRS-80 Cassette Version

Insert the TRS-80 side of the cassette, rewind it, and press the **PLAY** button. Type **CLOAD** and when **READY** appears type **RUN**. Keep the **PLAY** button depressed until the game is actually in process (you are in the Logistics Phase). After you answer the questions in the opening program another program will be loaded in. When **READY** appears type **RUN**. Press **RETURN**.

## Saving a Game in Progress

### Atari Disk and Apple Disk Versions

At the end of a turn you will be asked if you wish to save the game (you are given the option to continue the game after saving a turn). If you answer yes instructions will appear on the screen to allow you to do so. Please note that both versions will require you to insert a "saved game diskette". The Atari diskette must be formatted. The APPLE routine allows you to prepare a blank diskette for use as a "saved game diskette" (normal Apple initialized diskettes will not work).

### Atari and TRS-80 Cassette Versions

The program will ask if you desire to save the game. Before you answer yes insert a blank cassette and press the recorder **RECORD** and **PLAY** buttons. The Atari version also requires you to press **RETURN**.

## Recalling a Saved Game

In order to recall a saved game, begin loading as usual and select old game (or say **NO** to the menu option "NEW GAME"). Once this is done, follow the prompts given by the computer.

*NOTE: If you wish to keep the ratings you set at the beginning of your game, do not change any of the ratings when you recall the game.*

# II. SETTING UP THE GAME

Before actually playing the game you will need to set several parameters such as opponent type, scenario, difficulty level, etc. Although the parameters are basically the same for all computer versions the manner in which you input them into the computer differs.

## APPLE Version

The selected options are inverted on the screen. If you are in agreement press the space bar to continue. If not press the number which corresponds to the option you wish to change and the inverse will switch to the alternative.

## Atari Versions

Insert your joystick into port #1. The selected options are inverted on the screen. If you are in agreement toggle the joystick to the last option (**CONTINUE**) and press the **FIRE** button. If not, toggle the joystick to the numbered option you wish to change and press the **FIRE** button. The selected inverted option will change.

## TRS-80 Version

Press the number key or **Y** or **N** key to select the desired option on the screen.

Most of the parameters and options are self-explanatory, however there are some which deserve further clarification as listed below:

**Scenarios:** Depending on which computer system you are using, there are a maximum of five scenarios available as listed below:

- Tobruk '41 3/1941 (1 Turn)
- Tobruk '42 1/1942 to 6/1942 (3 Turns)
- El Alamein 7/1942 to 1/1943 (4 Turns)
- Campaign '41 3/1942 to 12/1942 (5 Turns)
- Campaign '42 3/1941 to 1/1943 (7 Turns)
- Campaign 3/1941 to 1/1943 (12 Turns)

Tobruk '41, Campaign '41, and Campaign all start on 3/1941. Unit availability and strengths are located on the Orders of Battle. The chart below gives you a breakdown of what is generally available for each scenario **at the start**.

Scenarios	# of mobile units	# of mobile strength pts.	# of non-mobile units	# of non-mobile strength pts.
	Ax/Al	Ax/Al	Ax/Al	Ax/Al
Tobruk '41, Camp. '41 and Campaign	4/1	1680/280	6/4	1305/1680
Tobruk '42, Camp. '42	8/5	1580/2134	5/8	845/1925
El Alamein	10/9	2818/3824	6/7	1069/924

**Ratings:** There are several aspects of the game which you are allowed to change. For each rating a number from 0 to 9 must be set. This will alter that aspect of the game by a certain percent as listed below:

For the aspects of Combat Points, Replacement Points, and German Supply Points:

Rating	% of Historical (Difficulty Level)
0	70 (expert)
1	80 (expert)
2	90 (expert)
3	100 (historical)
4	110 (intermediate)
5	120 (intermediate)
6	130 (novice)
7	140 (novice)
8	150 (novice)
9	160 (novice)

For the aspect of Air Points:

Rating	% of Historical (Difficulty Level)
0	40 (expert)
1	60 (expert)
2	80 (expert)
3	100 (historical)
4	110 (intermediate)
5	120 (intermediate)
6	130 (novice)
7	140 (novice)
8	150 (novice)
9	160 (novice)

For the aspect of Reinforcements:

Rating	Effect
1	arrive up to 4 turns early
2	arrive up to 3 turns early
3	arrive up to 2 turns early
4	arrive up to 1 turn early
5	arrive historically
6	arrive up to 1 turn late
7	arrive up to 2 turns late
8	arrive up to 3 turns late
9	arrive up to 4 turns late

**Levels of Difficulty:** There are four levels of difficulty: Expert, Historical, Intermediate, and Novice. Expert is the highest level of difficulty. The lower the level of difficulty given the greater the advantages received by that side (i.e. If an extremely good German player was to play a very inexperienced British player the German would choose Expert and the British Novice). Setting the level of difficulty will automatically set each rating to that level. Reinforcements are an exception in that the rating is always set to 5 (historical) for all levels.

**Random Initiative:** If you answer no then the initiative is historical as shown on the Turn Chart. If yes then there is a 50% chance that the initiative will go one way or another.

**Optional Axis Depot Units:** If you answer yes then the Axis will be given two additional depot units.

### III. SEQUENCE OF PLAY

(Also, quick start rules for experienced computer wargamers)

This section is designed so that an experienced wargamer can read it and get into the game immediately. The less experienced player will find it useful outline. The game consists of twelve turns (less if a scenario is selected). Each game turn consists of the following segments and phases.

## 1. Sequence of Play Overview

### A. Mobilization Segment

1. Reinforcement Phase
2. Supply Phase
3. Logistics Phase
4. Initiative Phase

### B. First Player Segment

1. Operational Phase—First Player: Both player's units receive a full allotment of operation points (Axis mobile-36, nonmobile-18 / Allied mobile-28, nonmobile-18). Second Player may be eligible for *limited reaction* during this phase.
2. Resupply Phase
3. Depot Movement Phase—First Player
4. Enemy Reaction Phase—Second Player: First Player may be eligible for *limited reaction* during this phase.
5. Operations Phase—First Player: First Player's units (only) receive a full allotment of operation points. Second Player may be eligible for *limited reaction* during this phase.
6. Resupply Phase
7. Depot Movement Phase—First Player

### C. Second Player Segment

1. Operations Phase—Second Player: First Player may be eligible for *limited reaction* during this phase.
2. Resupply Phase
3. Depot Movement Phase—Second Player
4. Enemy Reaction Phase—First Player: Second Player may be eligible for *limited reaction* during this phase.
5. Operations Phase—Second Player: Second Player (only) receives a full allotment of operation points for each unit. First Player may be eligible for *limited reaction*.

6. Resupply Phase
7. Depot Movement Phase—Second Player.

## D. Finalization Segment

1. Victory Determination Phase
2. Save Game Phase

## 2. Phase Description

### A. Reinforcement Phase

1. All eligible reinforcements arrive at each player's home base.
2. A maximum of six units can stack in the home base. A permanent garrison unit is present which counts as one unit towards the stacking limit.
3. If the stacking limit would be exceeded because of arriving units then the excess units are delayed until a turn when room is available.
4. Eliminated units may return as cadres which arrive in the same manner as reinforcements the turn following their elimination.
5. Cadres arrive only after all eligible reinforcements have arrived.

### B. Supply Phase

1. At this point in time all units of both sides have their supply status checked. A unit is either supplied or unsupplied. Unsupplied units may not receive additional supply or replacements and if they lack supply points for maintenance they are eliminated.
2. Axis combat units must be within two hexes and Allied combat units three hexes (Computer-Allied, 4 hexes) of a supply source to be supplied. Depot units must be within six hexes.
3. Home bases, Tobruk (if friendly), and other friendly depot units may serve as supply sources.
4. If depot units are used as a supply source then there must be a line of depot units no more than six hexes apart from each other back to the home base or Tobruk (if friendly).
5. Supply status is determined only by the range of the unit to a supply source. This range may be traced through enemy units or any terrain, including impassable and ocean hexes.

### C. Logistics Phase

1. Each player will cycle through their units (including arriving reinforcements and cadres).
2. A player may cycle through his units indefinitely by pressing the **F** key after each unit is displayed and flashed on the map. This gives a player the opportunity to see where his forces are and their current status. Depot units are an exception to this in that they must press the **R** key and allocate replacements to them when they first appear.
3. Pressing the **R** key for ready will require the player to input replacements, supply, and resupply priority into the unit.
4. For each category the player will input a number from zero to nine. For replacements and supply this will result in the unit receiving from 0% to 100% of the maximum amount allowed as shown on the display. For resupply priority the number inputted will indicate the percent (0% to 100%) of supply points to be received by that unit of the total eligible during the resupply phases of the current turn. The amount of supply that the unit actually receives is decreased by 1% per hex away from its home base.
5. Allied units are automatically given full supply and a resupply priority of nine. As a result the Allied player only inputs replacements into his units (Allied units may not be given replacements in March 1941). Axis supply is limited to what is remaining in the overall supply pool. Points remaining in this overall supply pool are located on the display (which can be accessed during play of the game).
6. During the Logistics Phase, Tobruk if held by the Allied is checked to see if it is surrounded by Axis units or ocean hexes. If it is not then the Axis overall supply is cut by 20%. Axis units must be east of Tobruk to trigger this. In addition any Axis

depot units alone in a hex within four hexes of Tobruk will be eliminated. The message, "DESERT RATS STRIKE", will appear when the above conditions are met.

7. Combat units lose 100 supply points at this time as a maintenance cost. Units with less than 100 supply points before maintenance are eliminated.
8. Depot units have a maintenance cost of 200 plus 25 per hex from their home base. Depot units automatically receive 400 supply points during the Logistics Phase. They are not resupplied during the turn.

## D. Initiative Phase

1. The player with the initiative is asked if he wishes to move first. If he does he then becomes the First Player.
2. Refer to the enclosed charts which indicate which side has the initiative for each turn. If you are using the random initiative option the chances will be even each turn as to who will have it.

## E. Operations Phase

1. During this phase the player may move/attack/fortify, expending operation points and supply points of the individual units as he does so. At the beginning of the first operations phase of each game turn each side receives a full allotment of operation points. At the beginning of each player's second operations phase of his player segment that player's units receive a full allotment of operation points.
2. Refer to the charts enclosed which detail supply and operation point costs.
3. Depot units may not be moved during this phase. Garrison units may never be moved.
4. To move the cursor on the map press **1** to **6** to go in the direction as indicated by the compass on the display. Pressing **T** will place the cursor on Tobruk and pressing **B** will place it over the player's home base. APPLE owners have additional features they can access at this time. Pressing **O** will center the screen on the cursor. All other features are listed on the screen with their required input to activate them. To move a unit or to examine the contents of a friendly hex place the cursor over the hex and press **G**.
5. Atari owners also press the **O** key to center the unit during cursor mode and while the unit is moving. During these two phases or modes, Atari owners may scroll freely around the map by first pressing the **START** key. Pressing the **START** key again returns you to the current phase or mode.
6. When **G** is pressed the units in the hex will be displayed and be numbered one to six followed by their unit number (refer to Order of Battle), combat strength, remaining supply points, and operation points.
7. To access a desired unit press the number (**1-6**) that corresponds to it. Press **F** to return to the cursor mode. The unit's statistics will now appear on the screen displaying its name, combat strength, mobile or nonmobile status, supplied or unsupplied status, morale, fortification level, remaining supply points, terrain of current hex, and remaining operation points. Units alone in a hex will automatically be accessed when **G** is pressed.
8. To move the unit press **1-6** to indicate the desired direction. To fortify press **B** to build one level of fortification per input. Pressing the **F** key will finish the unit for now and return the cursor. APPLE owners may remove all units on the screen by pressing **R** and then may return the units by pressing any other key. APPLE and ATARI owners may press **O** to center the moving unit on the screen.
9. Allied units in Tobruk or Alexandria may use sea movement by pressing **S**, providing a unit hasn't already used sea movement for that turn and no replacements were taken into units occupying Tobruk during the Logistics Phase.
10. Units moving into a position which does not contain a friendly unit and which is next to an enemy unit may trigger limited reaction for the enemy player (There is a 70% chance that this will occur). Limited reaction may also be triggered after each battle during the operations phase. There is a 25% chance of this occurring.

- a. The enemy player during limited reaction may choose units to be moved using the cursor the same as in any operations phase. Units are allowed to expend only up to  $\frac{1}{2}$  of their operation point allowance or remaining operation points, whichever is less, at any one time they are accessed to be moved.
- b. After a unit is **F** keyed the enemy player must pass an initiative check before he is allowed to move another unit. There is a 50% chance that he will pass the check.
- c. If a unit moves into a position adjacent to the enemy and that position is unoccupied by a friendly unit, then the limited reaction is ended and play passes back to the phasing player's operations phase.
- d. The enemy player may initiate combat during limited reaction only once, after which play passes back to the phasing player. Sea movement is not allowed.
- e. To exit the limited reaction phase voluntarily, press the shift and the **#** key.

11. The operations phase will continue until the player presses the shift and the **#** key. Atari owners choose the option on a menu.

12. Units attempting to move into a position containing enemy units trigger the combat sequence.

- a. The combat sequence begins by allowing the attacking player to look at each defending unit in the hex and deciding if he wishes to include that unit in the battle by inputting **Y** or **N**.
- b. A player may cycle through the defending units as many times as he desires until he presses **F**.
- c. The attacking player will then cycle through his units in the hex which initiated the combat, selecting those to be included in the attack. He will continue to cycle through his units until he presses **F**.
- d. The attacking player will now select a battle intensity (1-9), a level of risk (1-9), and the number of air points allocated to the battle.
- e. The defender chooses a level of risk and the number of allocated air points.
- f. Losses are subtracted from units involved in the battle. Supply costs are subtracted and captured supply added to the gaining units (from an eliminated enemy unit). Operation point cost for the battle by the units is also deducted.
- g. The results of the battle are displayed showing the intensity, risks, battle odds, casualties (those caused by risk are put into parentheses), and air count of results (See combat results explanation chart).
- h. Several factors govern the battle odds of a combat and also modify the amount of losses. Refer to the combat section in the main text for details.

13. During all phases in which units are allowed to move there is a stacking limit which must be observed at all times. A position may contain up to six units. The position containing Tobruk may only have four units in it.

## F. Resupply Phase

1. Units of both sides are judged to be in supplied status or unsupplied status according to the criteria listed in the Supply Phase.
2. Supplied units receive supply according to the resupply priority which was set for the unit in the Logistics Phase.
3. Allied units have an automatic resupply priority of nine which will give each supplied unit 100% of the supply points they are to receive. Axis units have this priority set by the player in the Logistics Phase from 0 to 9 (0% to 100%). Points actually received are decreased by 1% per hex away from the home base.

4. The supply points eligible to a unit during a resupply phase are determined by subtracting the unit's current supply from the unit's supply ceiling. This value is further modified by .25 during the resupply phases within the enemy's player segment.
5. Depot units are not resupplied during the Resupply Phase.

## G. Depot Movement Phase

1. Only the phasing player's depot units are allowed to move. Depot units are not allowed to move during any other phase including limited reaction.
2. Depot units are moved using the cursor and movement keys the same as any other unit.
3. Depot units do not trigger limited reaction nor do they initiate combat.
4. Depot units may participate in combat as attacking units only during the operations phases. Depot units may only be chosen as defending units when only depot units remain in the position.
5. You exit this phase by pressing the shift and # as any other phase. Atari owners use the joystick to select the "end phase" option.

## H. Enemy Reaction Phase

1. The non-phasing player is allowed what is essentially an operations phase sandwiched in between the operations phases of the phasing player.
2. In this phase the non-phasing player may move and have combat the same as any operations phase. Limited reaction on the part of the phasing player may also be triggered. Sea movement is allowed.
3. You may exit this phase the same as any other phase.

## I. Victory Determination Phase

1. Players receive one victory point per three casualty points inflicted on the enemy. These points are received immediately after combat.
2. At the end of the turn players receive points for whoever was the last side to occupy the towns of Benghazi, Bardia, and Matruh. Each position is valued at 50 points. Tobruk is valued at 100 points.
3. Each unit on the map receives points at the end of the turn as to its range from its home base: 0-3 hexes = 0 VP, 4-12 Hexes = 3 VP, 13-21 hexes = 6 VP, 22-29 hexes = 9 VP, and 30-34 hexes = 12 VP.
4. Refer to the victory conditions chart for levels of victory based on points.
5. Loss of the home base results in immediate total defeat. The British home base is Alexandria. The German home base is El Agheila.

# IV. MAIN TEXT OF RULES

## A. Units

1. Unit Description: There are twenty-eight Axis units and twenty-eight Allied units. These units have varied characteristics and capabilities as covered below. The units are represented on the map by various symbols which differs from computer to computer. Please refer to the Orders of Battle for both sides as you read this section.
  - a. **Unit Name:** Contains the historical designation of the unit with its size, type, and nationality included.
  - b. **Combat Strength:** Represents the unit's capability to inflict losses on the enemy in terms of manpower and weapons.
  - c. **Combat Strength Ceiling:** Is the maximum strength to which the unit is allowed to build by way of replacements. It also sets the breaking point of a unit since a unit is eliminated when its combat strength falls below 15% of its ceiling.

- d. **Morale:** Represents the cohesiveness of the unit in terms of training, esprit de corps, leadership, and experience. A unit's morale never changes. Morale modifies the number of casualties assigned to the unit by the combat results according to the chart below:

Morale	Modifier to Losses
1	1.6
2	1.5
3	1.4
4	1.3
5	1.2
6	1.1
7	1.0
8	.9
9	.8

A unit with a morale of 9 would lose only 80% of the casualties originally assigned to it. A morale of 5 would result in 20% more casualties than originally assigned by the combat results.

- e. **Unit Type:** Units are either mobile or non-mobile. This difference affects operation point allowances, operation point costs, and supply costs. Axis mobile units have an operation point allowance of 36 and Allied mobile units are given 28. Axis and Allied non-mobile units have an operation point allowance of 18. Refer to the Terrain Effects Chart for details on operation and supply costs for each type.
- f. **Supply Portage:** Each unit carries with it a certain amount of supply which is expended during movement, fortification, and combat. A unit whose supply total falls below 50 points has its combat strength cut by one half for defense. In addition, a unit with less than 50 supply points before a combat will not come back as a cadre if eliminated. Axis units must have a minimum of 100 supply points to be included in an attack. Allied units must have 200 supply points. Units receive additional supply points during the Logistics Phase, the resupply phases, and during combat after an enemy unit has been eliminated. See charts for supply costs.
- g. **Supply Portage Ceiling:** Mobile units have a ceiling of 600 supply points and non-mobile units have a ceiling of 500 points. This ceiling is the maximum amount of supply that the unit may carry.
- h. **Supply Status:** Units are either supplied or unsupplied. Combat units are judged to be in supply if they are within range of a supply source. Below are listed the ranges for combat units:

Unit	Range
Axis	2
Human Allied	3
Computer Allied	4

Depot units are in supply if within six hexes of a supply source. A depot unit may be used as a supply source if it is within six hexes of Tobruk (if friendly) or its home base or a line of depot units no more than six hexes from each other back to Tobruk (if friendly) or the home base. Unsupplied units may not receive supply during the Logistics Phase or the resupply phases.

- i. **Operation Points:** Movement, fortification, and combat consume operation points of the unit. Refer to the charts for actual costs. Axis units may have a minimum of 4 operation points and Allied units 6 operation points to combat in attack. Both sides receive a full allotment of operation points the first operations phase (regardless of which is the phasing player) of the game turn. Units will receive

another allotment the second operations phase of their player segment.

- j. **Fortification Level:** This is the level to which the unit has fortified itself within a specific position. A unit fortifies one level at a time by pressing **B** during any operations phase or limited reaction. Atari owners choose the "fortification" option on the menu. Fortification consumes operations points and supply points. Refer to the charts for actual costs based on unit type and terrain type. Each level of fortification increases the effective strength of the unit on defense by 20%. Terrain and fortification defense modifiers may not exceed 3 times the unit's original strength. Therefore each terrain type has a limit to which fortification has an effective advantage to the defending unit.

Terrain	Maximum Fortification Level (effective)
Clear	9
Rough	5
Fortress	3
Town	5
Mountain	3
Coast	8

Fortification past these levels by units would be to no avail. Immediately upon moving from a position the fortification level of the unit returns to 0. Units may still attack from a position and retain their fortification level as long as they do not move.

- k. **Arrival Date:** Units will appear on their home base during the Reinforcement Phase of the turn. If stacking would be exceeded then the units will wait until a turn when there is room. Reinforcements appear before returning cadres.
2. **Unit Elimination and Cadres:** When units are eliminated they may be eliminated from the game or come back as cadres at the player's home base in the Reinforcement Phase. If a unit is eliminated from the game the message, "\*\*\* ELIMINATED \*\*\*" will appear. If the unit will return as a cadre the message, "ELIMINATED-CADRE FORMED" will appear.
- A unit is eliminated when its combat strength falls below 15% of its combat strength ceiling. A unit with a ceiling of 800 would be eliminated if its combat strength fell below 120 points.
  - A unit is eliminated during the Logistics Phase if it fails to meet the maintenance cost of 100 supply points after supply allocation.
  - Units eliminated as a result of combat have a chance of returning as cadres (see table below). Cadre units appear at the home base the turn following elimination at the end of the Reinforcement Phase. Units eliminated during combat with less than 50 remaining supply points at the beginning of the combat automatically fail to return as cadres and are removed from the game.
  - A unit is eliminated without a cadre being formed if it is surrounded by enemy units and/or impassable hexes.

Unit Morale	% Chance to Return as Cadre
1	75%
2	80%
3	84%
4	86%
5	88%
6	89%
7	90%
8	91%
9	92%

- e. Attacking units which eliminate a unit, whether it returns as a cadre or not, divide the eliminated unit's remaining supply points evenly as captured supply which is made readily available to those units.

- f. During the Logistics Phase, Axis depot units located within four hexes of Tobruk which is Allied occupied and not surrounded by Axis units or ocean hexes are eliminated from the game if not stacked with another unit. This is triggered only if Axis units are east of Tobruk.

## B. Logistics

1. **Logistics Phase Procedure:** During this phase the Allied player will allocate replacements into his units. The Axis player will allocate supplies, replacements, and resupply priority to each of his units.

- The Axis player cycles through his units first. Pressing **R** will allow the player to allocate supplies and replacements into that unit. Depot units may only have replacements allocated to them. They automatically receive 400 supply points and are not resupplied during the game turn. Every unit must eventually be **R** keyed to be able to exit this phase.
- Players are first asked to input replacements (this is all that the Allied player will input) by pressing **0-9**. The number pressed will be the percent of the maximum replacements allowed into the unit as shown below:

Input	Percent
0	0%
1	11%
2	22%
3	33%
4	44%
5	55%
6	66%
7	77%
8	88%
9	100%

A unit with a maximum of 100 replacements would receive 22 strength points if a 2 were pressed. See the turn chart for replacement allocations per side for each game turn.

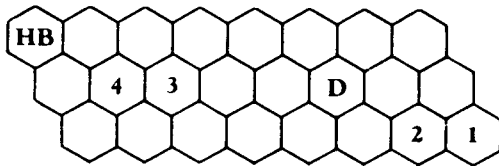
- Following replacements, supplies are allocated to the unit in the same manner as replacements. The number inputted is the percent of the maximum allowed into the unit will be modified in the resupply phases. This percent is further modified by .25 during resupply phases of the enemy player segment. For example, a unit with a maximum of 400 supply points allowed which has a resupply priority of 5 would receive 220 supply points during his player segment's resupply phases but only 55 points during the enemy segment.
2. **Supply:** Each unit carries its own supply. In order for a unit to move, fortify, and attack it must consume supply. To receive supply a unit must be within supply lines.
- Mobile units have a supply portage maximum of 600 points and non-mobile units have 500 points. Units receive supply during the Logistics Phase resupply phases, and after combat when a unit has been eliminated. Axis units are limited by the general supply pool. See turn chart which lists supply point reinforcements per game turn. Allied units are always given the maximum supply points allowed since their supply pool is unlimited in game terms. The number of supply points actually received into the unit is modified by the percent away from the home base. A unit 16 hexes away from its home base would have the amount of supply received cut by 16%.
  - Movement, fortification, unit maintenance, and combat consume supply. See the appropriate charts

for these costs. Each unit must expend 100 supply points after supply allocation during the Logistics Phase for unit maintenance. A unit unable to do so is eliminated from the game.

- c. A unit is either in supplied or unsupplied status. Unsupplied units may not receive supply points during the Logistics Phase and resupply phases. To be in supply a unit must be within range of a supply source. Home bases, Tobruk (if friendly), and depots may be used as supply sources. A depot unit may be used as a supply source only if it is within six hexes of the home base or Tobruk (if friendly) or within six hexes of a chain of depot units no further than six hexes apart which leads to the home base or Tobruk (if friendly). The ranges of the different combat units are listed below:

Unit	Range
German	2
Human Allied	3
Computer Allied	4

Supply may be traced through any terrain and even enemy units so long as the range for the unit is not exceeded. See example below for supply status:



In the above example the units are German units. **HB** stands for Home Base and **D** stands for depot. The supply status for each unit above is as follows:

1 = unsupplied    2 = supplied  
3 = unsupplied    4 = supplied

- d. A unit eliminated has its remaining supply points immediately divided among the enemy units which caused the elimination.
- e. If during the Logistics Phase, Tobruk is held by the Allies and not surrounded by Axis units or ocean hexes then Axis depot units alone in their hex will be eliminated if within four hexes of Tobruk and the overall Axis supply will be cut by 20%. Axis units must be east of Tobruk in order for the above to be triggered. When this occurs the message "Desert Rats Strike" will appear.

### C. Movement

- 1. Procedure: Movement occurs in the following phases: Operations Phase, Enemy Reaction Phase, Depot Movement Phase, and limited reaction. In each phase the procedure for movement is very much the same as outlined below:
  - a. When movement is allowed a white cursor appears on the map screen. This cursor may be moved to any hex on the map by pressing 1-6 to indicate direction and by pressing T for the cursor to appear on Tobruk and B for the cursor to appear on the home base.
  - b. To examine the contents of a friendly hex and to access units in order to move them press G. Units in the hex will be displayed and numbered one to six much like the example below:
 

1) 2- 100	400	18	2) 8- 600	450	36
3) 9- 250	400	30	4) 11- 300	300	20
5) 13- 60	250	15	6) 16- 150	300	18

In the example above there are six units. Each unit has four numbers which are the unit's number in the Order of Battle, combat strength, remaining

supply points, and remaining operation points (units in limited reaction will have displayed remaining operation points still eligible to use). The first unit above is unit #2 which is the 1st Depot Battalion. It has 100 combat points, 400 supply points, and 18 operation points. Pressing 1 at this point will exit this display and return the cursor on the hex. To access a unit press the number 1-6 which corresponds to the desired unit.

- c. A unit accessed will have its unit information displayed on the screen as in the example below:
 

21 GE PZ DIV COMBAT: 600 MOBILE SUPPLI  
MORALE: 9 FORT: 2 SUPPLY: 450  
TERRAIN: COAST OPERATION: 18 (36)

 The unit above is the 21st German Panzer Division with a combat strength of 600, a morale of 9 and a fortification level of 2. It has 450 remaining supply points and 18 remaining operation points for that movement and 36 remaining for the turn segments. It is a mobile unit in a supplied state currently located on a coastal hex.
- d. To move the accessed unit press 1-6 in the direction desired as indicated by the compass on the screen. Pressing F at this time will return the cursor onto the hex. Pressing B will fortify the unit by one additional level. Allied units eligible for sea movement may press S to do so (see movement restrictions).
- e. To exit the movement phase press the shift and the # key.

- 2. Allowances and Costs: All units are given allotments of operation points and supply points which are expended during movement.
  - a. Axis mobile units receive 36 operation points per allotment. Axis nonmobile and Allied nonmobile receive 18 operation points. Allied mobile units receive 28 operation points. Both sides receive allotments the first operations phase of the game turn. Each side receives another allotment the second operations phase of their player segment.
  - b. Units receive supply points based on several factors during the Logistics Phase, resupply phases, and combat sequence. Mobile units have a supply portage maximum of 600 points and nonmobile 500 points.
  - c. Supply and operation point costs for movement are summarized in the table below:

Terrain	Non-mobile		Mobile	
	operation	supply cost	operation	supply cost
Clear	3 / 9		3 / 9	
Rough	4 / 12		8 / 24	
Fortress	1 / 3		1 / 3	
Town	1 / 3		1 / 3	
Coast	1 / 3		1 / 3	
Mountain	6 / 18		12 / 36	
Impassable	P		P	

The "P" means that it is prohibited for units to enter that hex. A unit may only complete a movement action if it has sufficient supply and operation points.

- d. Fortification costs for mobile units are 40 supply points and 7 operation points per level. Nonmobile costs are 32 and 3.
- 3. Restrictions: There are several limitations, exceptions, and restrictions to movement as listed below:
  - a. Garrison units may never move.
  - b. Depot units may only move during the Depot Movement Phase.
  - c. Units must have sufficient operation points and supply points to complete an action.

- d. Units may not enter impassable hexes or ocean hexes.
- e. No more than six units may ever be in the same hex. In Tobruk only four units may stack together.
- f. Allied units in Tobruk or Alexandria may be eligible to use sea movement. One unit per game turn may be transferred between Alexandria and Tobruk (or vice versa). If units in Tobruk receive replacements then no sea movement is allowed for that turn. Axis occupation of Tobruk cancels any sea movement orders.
- g. A unit's fortification level returns to 0 when it moves from its current location.
- h. During the operations and enemy reaction phases, movement into a hex unoccupied by friendly units next to an enemy unit will trigger limited reaction for the other side.
- i. Depot units do not trigger limited reaction.
- j. During limited reaction, movement into a hex unoccupied by a friendly unit next to an enemy unit will end the limited reaction.
- k. During limited reaction, units may only expend up to 1/2 of their operation point allowance or remaining operation points, whichever is less, each time those units are accessed to be moved.

## D. Combat

1. **Combat Sequence Procedure:** A unit initiates combat whenever it attempts to enter a position containing a friendly unit.
  - a. The combat sequence begins by allowing the attacking player to cycle through the defending units as many times as desired. For each unit he inputs **Y**, **N**, or **F** to the question, "Attack Unit Y/N?". Inputting **Y** or **N** answers yes or no to the question. A **F** input will finish the selection of defending units. Unless a unit has been entered with a **Y** the **F** key will set all units to an **N** answer. For example, if you press **F** to the very first defending unit your attack would be canceled. It would also be canceled if you pressed **N** for every defending unit. Please note that depot units will not appear to be attacked unless they are alone in the hex without another combat unit.
  - b. When **F** is pressed for the defending unit selection the attacking player will then cycle through his units in the attacking hex and input **Y**, **N**, or **F** in answer to "Attack with unit Y/N?". Units with insufficient supply and/or operation points will be so displayed when a **Y** is inputted. As with the defending units an **F** input finishes the selection marking units only inputted with a **Y** as the attacking units.
  - c. The attacking player selects a battle intensity (1-9), a level of risk (1-9), and the number of allocated air points. The higher the intensity chosen the greater the losses of the battle will be and the greater the cost of the battle in terms of operation points and supply points. The higher the level of risk the greater the random introduced in the combat results (see risk table). A player will be able to allocate a maximum of 9 air points, or less if there are fewer remaining air points per battle round. Players receive air points each game turn according to the turn chart. These points are cumulative from turn to turn. The available air points are reusable each phase of the game turn and are subject to air casualties (see air loss table). Each air point increases the attacker's strength by 20% and the defender's by 15%.
  - d. The defender chooses a level of risk (1-9) and the number of allocated air points.

- e. Losses are displayed for each unit and the combat results for the battle is also displayed (see combat results explanation).

2. **Combat Costs:** Combat consumes supply and operation points. See the enclosed charts which list costs for combat in supply and operation points. Human Allied units consume 30% more supply in combat. The defender consumes 50% less supply in combat than the attacker. The attacker also consumes more operation points than the defender (see appropriate combat charts).
3. **Combat Restrictions and Special Cases:** A unit must have sufficient operation and supply points to attack. Some other special cases also apply.
  - a. Allied units must have at least 200 supply points and 6 operation points to be allowed to attack. Axis units must have a minimum of 100 supply points and 4 operation points.
  - b. Depot units may only be attacked if no other combat units exist in the hex.
  - c. Units with less than 50 supply points have their strength cut by one half.
  - d. Defending units consume less supply and operation points.
  - e. Units eliminated in combat may return as cadres if they have more than 50 supply points remaining. See cadre table.
  - f. Victorious units share the remaining supply points of an eliminated unit.
  - g. During a limited reaction phase only one attack is allowed before play is passed to the phasing player.
4. **Battle Odds Calculation:** Several factors govern odds calculation.
  - a. The defender's combat strength is first modified by supply. If it has less than 50 points its strength is cut by 1/2.
  - b. The defender's combat strength is then multiplied by the sum of the terrain and fortification modifiers. This value may not exceed three times the original strength. The fortification level of the unit is multiplied by .2 to derive the fortification modifier which is added to one of the terrain modifiers below.
 

Terrain	Modifier
Clear	1.0
Coast	1.5
Rough	2.0
Town	2.0
Fortress	2.5
Mountain	2.5
  - c. The defender's strength is then modified by the air power points entered by the defending player. Each point increases the strength by 15%. The modified combat strength after air power may not exceed 4.5 times the original strength. Air points may be lost as a result of combat (see air loss table).
  - d. Example (defender's modified strength): If a defending unit has 100 combat points, 200 supply points, is located in a town, has a fortification level of 4, and allocates 3 air points, its modified combat strength would be 406. The supply modifier would be 1.0 since the unit has more than 50 supply points. The terrain modifier of 2.0 and the fortification modifier of 0.8 add up to 2.8. The original combat strength multiplied by 2.8 equals 280. The 280 is multiplied by the air power modifier of 1.45 (15% per air point) to arrive at a modified strength of 406.
  - e. The attacker's combat strength is first modified by air points allocated by the attacker. Each air point increases the attacker's strength by 20%. Air points may be lost as a result of combat.
  - f. The attacker's combat strength is then modified by combat bonuses determined by nearby units



not directly involved in combat. The attacker adds 300 combat points per friendly hex next to the defending units. The attacker also adds 100 combat points per non-participating friendly unit in the attacker's hex. The attacker subtracts 200 combat points from its strength for each non-participating enemy unit in the defender's hex and per friendly hex next to the defender's hex. The attacker's modified strength may be no less than 1/2 of, or 2 1/2 times greater than, its original strength.

g. Example (attacker's modified strength): If attacking units have a original strength of 1500 points, inputed 5 air power points, had 2 non-participating friendly units in the attacking hex, 1 friendly unit next to the defender's hex, 3 non-participating enemy units in the defender's hex, and 2 enemy units next to the defender's hex the modified attacker's strength would be 2500. The 1500 is multiplied by 2.0 for air power (20% per air point) for an increase to 3000. 200 points are added for the non-participating units in the attacker's hex and 300 for the unit next to the defender's hex for a modified strength of 3500. 600 points are subtracted for the non-participating enemy units in the defender's hex and 400 points for the the two enemy units next to the defender's hex for a final modified strength of 2500 points.

h. Battle odds are determined by dividing the attacker's modified strength by the defender's modified strength.

5. Loss Determination: Several factors determine the losses to the attacking and the defending units.

- The overall attacker's losses are determined by first calculating the base loss. The base loss is equal to 5 plus the level of battle intensity times .006 times the attacker's combat strength (unmodified).
- To arrive at the attacker's overall losses the base loss is multiplied by the risk factor and then added to the number of defender's air points allocated to the battle. The risk factor is a random depending on the level of risk chosen by the attacking and defending players. The risk factor is randomized separately for the attacker and defender. See risk table below.

Sum of Att. and Def. Risk	Random
2	.97 to 1.08
3	.95 to 1.12
4	.93 to 1.16
5	.91 to 1.20
6	.89 to 1.24
7	.87 to 1.28
8	.85 to 1.32
9	.83 to 1.36
10	.81 to 1.40
11	.79 to 1.44
12	.77 to 1.48
13	.75 to 1.52
14	.73 to 1.56
15	.71 to 1.60
16	.69 to 1.64
17	.67 to 1.68
18	.65 to 1.72

- If the attacker's strength was 1000, the battle intensity 9, and the sum of the defender's and attacker's risk 12 then the attacker's overall losses would range from 70 to 129.
- The overall attacker's losses are now distributed proportionately (according to size of unit in strength) among the attacker's units. An attacking unit's assignment of losses is further modified by its

morale according to the chart below:

Morale	Loss Modifier
1	1.6
2	1.5
3	1.4
4	1.3
5	1.2
6	1.1
7	1.0
8	0.9
9	0.8

As a result, the total losses of the attacker will probably exceed the original overall losses after being modified by the individual units' morale.

The defender's losses are determined in the same manner as the attacker's except the number of attacker's air points are used instead of the number allocated by the defender. The second and most important difference is that the defender's losses are increased by the odds. The more favorable the odds for the attacker the more losses the defender will suffer. The formula for the defender's overall losses is therefore, the base loss times the odds, times 1/2 added to the base loss times the odds, added to the number of air points allocated by the attacker.

## V. SOLITAIRE PLAY

When playing against the computer you will command the Axis forces and the computer the Allied forces. The following rule changes will be in effect:

- The Allies will be luckier by about 20%.
- Allied units have to be within four hexes of a depot unit.
- Allied units expend less supply in combat than normally.
- Allied units have less of a chance to trigger limited random during movement.
- Allied units come on board with more strength as cadre units.
- Allied units have a decreased chance of being eliminated when a cadre being formed.
- Strength points displayed on the screen are randomized.

## VI. STRATEGY AND TACTICS

Below are some helpful hints on how to play the game.

- Towns are very important to take since they provide so many victory points. Benghazi and Bardia are especially useful since they control avenues of approach. Tobruk is important as a supply source and also for the number of victory points received. Since points are given for towns each turn the earlier you take a town and the longer you hold it the more victory points you will enjoy.
- Protect your home base at all costs since loss of it is an automatic defeat.
- The first turn of the game the Axis should be able to take Bardia and surround Tobruk.
- Always move your units as far forward as you dare since you receive more victory points per unit the further you are from your home base.
- Be careful of your supply lines, since unsupplied units cannot take in supply or replacements and become eliminated if unable to meet their maintenance cost.
- Be aware that if your front line is past Tobruk and Tobruk is not surrounded you will be hit by the Desert Rats which will cost you supply and perhaps depot units.
- When you attack take into account the combat power assigned by units next to the defender and in the attacker's and defender's hex. Also be careful not to overkill your enemy by

too intensive an attack. Air power is a percent modifier; therefore, it is more effective when used with large attacking groups.

8. Be careful not to totally spend the supply of your individual units since their strength will be 1/2 of normal when defending and if eliminated will not return as cadres.
9. When defending keep in mind that units in the hex under attack and units next to the defender's hex serve as significant combat bonuses. Cadres are good for this role behind lines. Also when defending be aware of the value of fortification, but be sure not to over-fortify. Note also that rough, fortresses, and towns are superior terrain to defend on. Generally speaking, a good defense is an aggressive defense with careful and well-planned counterattacks. Keeping strong units in reserve can be a powerful counterbalance to an enemy offensive.
10. While on the offensive it is generally better to outflank a strong point and expose its supply line rather than hitting it head on.
11. When heavily outnumbered, retreating is the best strategy since the enemy will have to burn supply and operation points to pursue you. Weak screening in front of your retreating forces will additionally slow the attacker.
12. The El Alamein line can be a difficult nut to crack and almost impossible. The British will be invariably building for a crushing offensive. For that reason the Axis player should attack the El Alamein line until he is no longer eliminating units and then fortify. When the British launch their final offensive even a fortified line will not hold and careful planning must be made for an organized retreat.
13. Be aware that depots move in their own phase after regular combat unit movement. Until you have an established line they will always be playing "catch-up".
14. In the Logistics Phase give high resupply priorities to those units which you expect to be heavily using their supply. To conserve supply use only the minimum number of depots from the home base.

## VII. DISPLAY

An example of the display is shown below.

DATE: 1-1942    **KNIGHTS OF THE DESERT**    SCORE: -519  
 ALLIED: AIR 14/20    SP ---ALREPL 138    SEALIFT 1    VP 2285  
 AXIS: AIR 15/18    SP 1186    ITREPL 20    GERREPL 100    VP 1766

The current turn is January-February 1942. The score is -519 with The Allied player having accumulated 2285 victory points and the Axis player 1766 victory points.

The Allied player has 20 airpoints available for use with only 14 available to use currently in this Operation Phase. He has used 6 airpoints already on missions in the Operations Phase. The Axis player has 18 airpoints available with 15 ready to use in the current Operations Phase. He has used 3 airpoints on missions in this phase.

The Axis player has 1186 supply points left. The British player has an unlimited supply base so its supply points are not shown.

The Allied player has 136 replacement combat points left, the Italian player 20 replacements, and the German player 100 replacements left.

The Allied player can sealift one unit.

## VIII. SUMMARY OF KEYBOARD INPUTS

### LOGISTICS PHASE

- (D) Access Display (Apple only)
- (.) Ready to allocate Repl/Supply/Resupply to unit
- (F) Finished with unit. Skip unit temporarily until next round.
- (0-9) Replacements    Allocate replacements to unit.
- (0-9) Supply    Allocate supply to unit.
- (0-9) Resupply    Allocate resupply value to unit.

### INITIATIVE PHASE

- (Y) Yes    Player wishes to move/attack first.
- (N) No    Let enemy player move/attack first.

### \*OPERATIONS PHASE CURSOR MODE

- (T) Tobruk    Move cursors to Tobruk.
- (B) Base    Move cursor to friendly home base.
- (G) Get unit    Display friendly units in hex. See Selection of Unit.
- (1-6) Moves cursor across map in directions 1-6.
- (#) Exits the current Phase.

### OPERATIONS PHASE SELECTION OF UNIT

- (F) Finished — Program returns back to Operations Phase Cursor Mode.
- (1-6) Selects unit to be moved.

### \*\*OPERATIONS PHASE MOVEMENT OF UNIT

- (B) Build fortification    Unit's fortification level increased by 1 level.
- (S) Sea movement    Allied unit moves from Tobruk to Alexandria; vice-versa.
- (F) Finished    Unit finished movement. Return to Cursor mode.
- (1-6) Moves unit across map. An attempt to enter enemy hex results in combat.

### OPERATIONS PHASE — ATTACK ENEMY UNITS

- (Y) Yes    You wish to attack unit displayed.
- (N) No    You do not wish to attack the unit.
- (F) Finished — Proceed to Attack With Friendly Units.

### OPERATIONS PHASE — ATTACK WITH FRIENDLY UNITS

- (Y) Yes    You wish to attack with the unit displayed.
- (N) No    You do not wish to attack with the friendly unit displayed.
- (F) Finished — Proceed to Attacker's Battle Intensity/Risk/Air

### ATTACKER'S BATTLE INTENSITY/RISK/AIR

- (1-9) Battle Intensity for attacker. 1 is light attack, 9 is heavy attack.
- (1-9) Risk for attacker. 1 is low risk, 9 is high risk.
- (0-9) Air points committed. 0 is no air points, 9 is 9 air points committed.

### DEFENDER'S RISK/AIR

- (1-9) Risk for defender.
- (0-9) Air points for defender.

#### \* Apple Owners (additional Keys)

- (0) Center cursor on screen
- (R) Removes units from map
- (M) Prints strategic map
- (D) Prints display

#### \*\* Apple Owners (additional keys)

- (0) Centers unit on the screen
- (R) Removes unit from the screen
- (D) Prints display

#### \* Atari Owners (Additional Keys)

- (0) Centers cursor on screen
- (START) Allows scroll (Press START again to return)

#### \*\* Atari Owners (additional keys)

- (0) Centers cursor on screen
- (START) Allows scroll (Press START) again to return)

# IX. ORDER OF BATTLE

**Abbreviations:** REG = regiment  
 BATT = battalion  
 DIV = division  
 BRIG = brigade  
 GARR = garrison

PZ = panzer  
 INF = infantry  
 ARM = armor  
 NMOBILE = Non-Mobile  
 MECH = Mechanized

GE = German  
 IT = Italian  
 BR = British  
 AUST = Australian  
 IND = Indian

SA = South African  
 NZ = New Zealand  
 FR = French  
 FA = Fascist  
 GRIN = Greek/Indian  
 MISC SAPI = So. African-Polish Indian

## AXIS UNITS

UNIT #	NAME OF UNIT	COMBAT	COMBAT CEILING	MORALE	TYPE	DATE ARRIVAL
1	1 AXIS GARR REG	100	300	3	NMOBILE	START
2	1 AXIS DEPOT BATT	30	200	1	NMOBILE	START
3	2 AXIS DEPOT BATT	30	200	1	NMOBILE	START
4	3 AXIS DEPOT BATT	30	200	1	NMOBILE	START
5	4 AXIS DEPOT BATT	30	200	1	NMOBILE	START
6	5 AXIS DEPOT BATT	30	200	1	NMOBILE	START
7	6 AXIS DEPOT BATT	30	200	1	NMOBILE	START
8	21 GE PZ DIV	665	800	9	MOBILE	START
9	200 GE INF REG	280	400	8	MOBILE	START
10	ARIETE IT ARM DIV	560	600	5	MOBILE	START
11	7/TRENTO IT MECH REG	175	200	6	MOBILE	START
12	TRENTO IT INF DIV	385	400	4	NMOBILE	START
13	BRESCIA IT INF DIV	245	300	4	NMOBILE	START
14	SABRATHA IT INF DIV	45	300	4	NMOBILE	START
15	PAVIA IT INF DIV	210	300	4	NMOBILE	START
16	BOLOGNA IT INF DIV	210	300	4	NMOBILE	START
17	SAVONA IT INF DIV	210	300	4	NMOBILE	START
18	15 GE PZ DIV	700	800	9	MOBILE	5-1941
19	90 GE INF DIV	350	400	6	MOBILE	7-1941
20	9/TRIESTE IT MECH REG	245	300	5	MOBILE	9-1941
21	TRIESTE IT INF DIV	210	300	4	MOBILE	9-1941
22	LITTORIO IT ARM DIV	315	400	4	MOBILE	1-1942
23	SNDVRBD GE INF REG	245	300	6	MOBILE	3-1942
24	RANCHE GE INF BRIG	385	400	8	NMOBILE	7-1942
25	164 GE INF DIV	560	600	6	MOBILE	7-1942
26	PISTORIA IT INF DIV	210	300	5	NMOBILE	7-1942
27	FOLGORE IT INF DIV	175	200	5	NMOBILE	7-1942
28	YOUNG FA IT INF DIV	105	200	2	NMOBILE	7-1942

## ALLIED UNITS

UNIT #	NAME OF UNIT	COMBAT	COMBAT CEILING	MORALE	TYPE	DATE ARRIVAL
29	1 BR GARR REG	600	600	3	NMOBILE	AT START
30	1 BR DEPOT BATT	100	200	1	NMOBILE	AT START
31	2 BR DEPOT BATT	100	200	1	NMOBILE	AT START
32	3 BR DEPOT BATT	100	200	1	NMOBILE	AT START
33	4 BR DEPOT BATT	200	200	1	NMOBILE	AT START
34	5 BR DEPOT BATT	200	200	1	NMOBILE	AT START
35	6 BR DEPOT BATT	200	200	1	NMOBILE	AT START
36	2 BR ARM DIV	280	600	5	MOBILE	AT START
36	9 AUST INF DIV	590	600	5	NMOBILE	AT START
37	MISC SAPI INF DIV	290	300	5	NMOBILE	AT START
38	70 BR INF DIV	350	400	5	NMOBILE	AT START
39	4 IND INF DIV	390	400	5	NMOBILE	AT START
40	7 BR ARM DIV	315	900	6	MOBILE	5-1941
41	22 BR ARM BRIG	245	500	5	MOBILE	5-1941
42	1 BR ARM BRIG	245	300	5	MOBILE	5-1941
43	1 SA INF DIV	370	400	3	NMOBILE	5-1941
44	2 NZ INF DIV	465	600	5	NMOBILE	5-1941
45	5 IND INF DIV	350	400	5	NMOBILE	7-1941
46	2 SA INF DIV	315	400	3	NMOBILE	7-1941
47	1 BR ARM DIV	595	800	6	MOBILE	11-1941
48	50 BR INF DIV	465	500	5	MOBILE	1-1942
49	FREE FR INF DIV	245	300	6	NMOBILE	1-1942
50	10 BR ARM DIV	665	700	5	MOBILE	3-1942
51	10 IND INF DIV	210	300	5	MOBILE	5-1942
52	51 BR INF DIV	560	600	5	MOBILE	7-1942
53	44 BR INF DIV	560	600	7	MOBILE	7-1942
54	8 BR ARM DIV	700	700	5	MOBILE	7-1942
55	MISC GRIN INF DIV	140	200	5	NMOBILE	7-1942

# X. CHARTS AND TABLES

## COMBAT LOSS CHART

ATT CP	BATTLE INTENSITY								
	1	2	3	4	5	6	7	8	9
100	5	6	6	7	8	8	9	9	10
200	6	7	8	9	11	12	13	14	15
300	6	8	10	12	14	15	17	19	21
500	8	11	14	17	20	23	26	29	32
800	9	14	19	24	29	33	38	43	48
1000	11	17	23	29	35	41	47	53	59
1500	14	23	32	41	50	59	68	77	86
2000	17	29	41	53	65	77	89	101	113
2500	20	35	50	65	80	95	110	125	140
3000	23	41	59	77	95	113	131	149	167

## COMBAT OPERATION CHART

BATTLE INTENSITY	ATTACKER		DEFENDER	
	AXIS	ALLIED	AXIS	ALLIED
1	4	5	1	2
2	5	6	2	3
3	5	6	2	3
4	6	7	2	3
5	6	7	2	3
6	7	8	2	3
7	7	8	2	3
8	8	9	2	3
9	8	9	2	3

EXAMPLE: 15 PZ DIV attacks 9 AUST INF DIV at Battle Intensity 6.  
 15 PZ DIV is AXIS- 7 Operation Points expended.  
 9 AUST INF DIV is ALLIED- 3 Operation Points expended.

## AIR LOSS TABLE

# pts. allocated	Chance to destroy 1 enemy air pt.
0	9%
1	36%
2	36%
3	40%
4	42%
5	44%
6	46%
7	48%
8	50%
9	52%

## MORALE TABLE

MORALE	MODIFIER
1	1.6
2	1.5
3	1.4
4	1.3
5	1.2
6	1.1
7	1.0
8	.9
9	.8

## COMBAT RISK TABLE

RISK TOTAL	LOSS MODIFIER
2	.97-1.08
3	.95-1.12
4	.93-1.16
5	.91-1.20
6	.89-1.24
7	.87-1.28
8	.85-1.32
9	.83-1.36
10	.81-1.40
11	.79-1.44
12	.77-1.48
13	.75-1.58
14	.73-1.56
15	.71-1.60
16	.69-1.64
17	.67-1.68
18	.65-1.72

## UNIT CADRE TABLE

MORALE	% Chance to Return as Cadre
1	75%
2	80%
3	84%
4	86%
5	88%
6	89%
7	90%
8	91%
9	92%

EXAMPLE: 21 PZ DIV is eliminated in combat. It has a morale of 9. There is a 92% chance that the unit will return as a cadre, a 8% chance that it will be eliminated from the game. If a unit has less than 50 Supply Points left when eliminated (before supply is deducted for defending), then the unit is automatically eliminated from the game.

## DEFENDER ODDS

ODDS	MODIFIER
5-1.	.25
1-1	.50
2-1	1.00
3-1	1.50
4-1	2.00
5-1	2.50
6-1	3.00
7-1	3.50
8-1	4.00

## AIRPOWER TABLE

# AIR	LOSS
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

**ATTACKER LOSSES:** Find the loss in the Combat Loss Chart. Multiply this loss by Risk and add losses due to Defender's Airpower. These losses are distributed among attacking units according to their combat strength. Each unit has its loss multiplied by the Morale modifier.

**DEFENDER LOSSES:** Same as Attacker except also modify the loss in Combat Loss Chart by the odds modifier along with the risk.

## VICTORY CHART

Compare your score to the ranges below for the level of victory.

Scenarios						Level of Victory
Tobruk '41	Tobruk '42	El Alamein	Camp. '4	Camp. '42	Campaign	
< -130	< 60	< 400	< 30	< 700	< 900	Allied Strategic
-130 to -31	60 to 179	400 to 599	30 to 129	700 to 899	900 to 1199	Allied Tactical
-30 to 49	180 to 249	600 to 799	130 to 219	900 to 1099	1200 to 1599	Allied Marginal
50 to 119	250 to 399	800 to 999	220 to 364	1100 to 1299	1600 to 1999	Axis Marginal
120 to 219	400 to 549	1000 to 1599	365 to 479	1300 to 1499	2000 to 2399	Axis Tactical
220 +	550 +	1600 +	480 +	1500 +	2400 +	Axis Strategic

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# BRAZEN KNIGHTS AND BLAZING SANDS

By Robert S. Billings

Never before had such a war been fought. Never again would such a war be possible. It was as if the gods had looked down on this puny creature man, with his war-like dreams of glory, his monstrous, proud machines, and then said: go to it! If that's what you want, then here's your chance to show what you can do (perhaps your last chance before you have so much power that there can be no glory in its use). For once, then, let there be a marriage of medieval man and modern machine. For once let brazen knights, pennants raised and flying in the desert sunlight, spur their armored steeds across the blazing sands. Let Greek and Trojan pause in frozen battle to stare in awe and see themselves surpassed in spectacle for song and story.

And so the gods had picked man up, with all his treasured playthings — his trucks, his tanks, his armored cars, his guns, his planes, his mountains of bombs and shells and ammunition — and set him down in a barren land where he could do little harm to anyone or anything else, and turned him loose in the desert sun. It was an alien land to these men of bronze and steel, of brazen spirit and iron machines — but a land well chosen to absorb their worst. Bordered on the north by the empty blue of an indifferent Mediterranean, for thousands of square miles it stretched away in all directions, hard and uncompromising, sand and rock and gravel. Almost bereft of towns and cities (a rare, occasional dot along the coast, soon swallowed up in emptiness), featureless, almost (here and there a ridge, depression, cliff — implacable and mute), vacant and clean as a page of tomorrow's history.

Little more than twenty years before, war had meant packed hordes of helpless human beings crawling through muck and mud, acres of bodies and pieces of bodies ripped and torn and indistinguishable from the sludge and mire that trapped and held them as they dutifully followed orders and struggled to trade tons of human flesh for a few precious inches of terrain. After four long years of this madness, most of the civilized world had thought such human waste could never again be justified, would never again be allowed to occur.

But now for just a flicker on the screen of history it had suddenly all changed. Clerks, machinists, factory-workers, farmers had been pulled up from the mire, sprayed clean, mounted on shiny stallions and motor-driven chariots, and sent to dash across the sunlit plain like the knights of old.

There was, of course, another view. The sand that covered every face and sought to wedge its particles under the protective eye-glasses; the oppressive daytime heat that was everywhere, in tank and truck and armored

car, in every scraped-out foxhole and headquarters tent; the sandstorms that suddenly appeared, darker than any night, covering men and machines like an arid and scratchy blizzard, making the air one breathed a dry and suffocating soup; the flies that were everywhere, covering the mess-kit, the cup, the spoon, the mouth itself; and the sun like a blast furnace from which, all the long desert day, there was no escape. These — and the same shells as before, blasting, maiming still. And now death had donned an even more fearsome mask — the brightly colored, fiery flash when a tank, smashed by an eighty-eight, would (in hardly more than a second) "brew up."

But there is no war without the dead. And if dead is dead, no matter how, yet to survivors years later, and to us looking through the reversed-telescope's lens of history, they seemed somehow to die in style. And if it seemed otherwise to the dead themselves, no one has yet found a way to survey the dead for an opinion.

O'Connor came first. O'Connor and Wavell. Two of the most remarkable British commanders of the entire war. Lieutenant-General Richard N. O'Connor was a small, shy, bird-like man who looked more like a scholar than the daring battlefield commander he was. Before hostilities had got under way he had been sent up to command the "Desert Rats." He served under the Middle East theater commander Sir Archibald Wavell, a strangely silent military genius who could condense his vast wisdom into concise poetry but never learned the self-promoting art of public grand-thinking (one part strategy and ten parts hot air). These two came first and set a standard for desert command rarely equalled and never surpassed. But fate and political grand-thinkers were to rob them of the greater fame that should have been theirs.

At the start of the North African war in June 1940, there were approximately half a million Italians in northern and eastern Africa. The British had hardly fifty thousand. Three hundred thousand of the Italians were in Libya. The Italian Tenth Army, with seven divisions, moved on September 13, 1940, against a small covering force on the Egyptian frontier and advanced for 60 miles. The British force retreated slowly until Marshall Graziani had occupied Sidi Barrani and settled down to enjoy his "victory."

Then came the battle of nerves that had to be fought many times in North Africa — the British commander trying to prepare a telling blow with scarce resources while holding off Prime Minister Winston Churchill's insistent call for immediate action. But Wavell was equal to the job. He and his subordinate commanders, including O'Connor (who would

have to carry out the operation) planned and rehearsed a blow at the Italian Tenth Army, which was sitting comfortably in widely separated camps south of Sidi Barrani. There would be few British troops to call on to face the horde of Italians with their hundreds of guns and tanks. But those few were good, regular British Army troops, their "I" (Infantry) tanks too heavily armored to be destroyed by the Italian anti-tank guns, their leaders truly inspired commanders. While Churchill fumed and called for action, Wavell waited until troops, supplies, and weather were all as needed. He finally started the move on the night of December 7/8. The attack went just as planned. There was a long night march, followed by further travel to get the troops into striking position. Still fifteen miles from their objective, they set out on a tricky night march right through a gap in the Italian camps. Carefully skirting behind the first camp to reach the northwest side where photos showed supplies were brought in (and thus would be free of mines), they burst into the midst of the Italians, having achieved a perfect surprise. Finishing off this camp, the tanks moved quickly to support an attack on a second camp. Part of the 7th Armored Division had moved further west and cut off the main coast road to trap other units of the Tenth Army, most of whom were now trying to escape. The battle ended on December 11. The Italians had been forced out of Egypt, had lost 38,000 prisoners, 237 guns, 72 tanks — and a good part of their morale. The total British loss was 634.

One wonders what such commanders and such soldiers would have accomplished against the mighty Rommel. But already the infantry division was being readied to ship to the Sudan for the operation there. And Churchill was pressing for release of other troops for Greece. The incomparable British desert force was being broken up after it had barely had a chance to prove its excellence in desert fighting.

But O'Connor, with parts of an untried Australian infantry division as replacement, and with the reliable though somewhat battered 7th Armored Division, was ahead through. Even greater triumphs lay ahead for the little commander with the bird-like manner. By January 3rd he was ready to force the strong Italian fortress at Bardia. The next day it had fallen to his scratch force, and he had another 40,000 prisoners. But he was in a race against time and decisions being made far from Africa by Churchill and Hitler. On January 10th the Prime Minister offered Greece, in effect, most of the crack troops. O'Connor had fashioned and led up the finest force of desert fighters the war would know. For the moment the Greeks were not ready to accept. But they would be before

much longer.

The very next day Hitler made the decision to send what would become Rommel's Afrika Korps to support the Italians in Tripoli. Even as the Italians were being soundly defeated by Wavell's strategic soundness and O'Connor's tactical ingenuity, Rommel was on the way to Africa.

But O'Connor was still not through. Three days after the fall of Bardia he had invested Tobruk. It was a strongly fortified position well-stocked with provisions, tanks, guns, and over 30,000 men. O'Connor soon had his dispositions made. On January 21st he broke through the wire, minefields, and anti-tank ditch, and after a day and night of pitched battle forced the fortress to surrender. The booty included 25,000 prisoners, 208 guns, two-months' supply of tinned rations, a large fresh water supply — and a port that was restored and working in three days.

Then he planned his master stroke — a daring move which could annihilate the entire remainder of the Italian Tenth Army. That force was retreating up around the bulge in the coastline containing the Jebel Achdar — an area of fertile fields in the half-continent of desert. The coast road went around the bulge and then south for some distance before turning west toward Tripoli, the Italians' last remaining base hundreds of miles away. If O'Connor could get some troops across the base of the bulge (it was considered by the Italians and almost everyone else as impassably rough terrain) he might be able to cut off the whole Italian force as it retreated back along the coast road.

There were a multitude of reasons why such an attempt would go awry — might, in fact, turn into a desert disaster. O'Connor's few remaining tanks were falling prey to mechanical problems after use heavy beyond what they had been intended to undergo; they could well be reduced to nothing in a prolonged trip over such difficult terrain. He would have supplies, at best, for two refills of fuel and ammunition when (and if) he got there — but there would be no possibility for further resupply for some time after that. And no one knew just how bad the journey would be, whether even the wheeled vehicles could make it through such a wasteland, to say nothing of the nearly worn-out tanks.

But he learned the Italians were rushing through Benghazi and down the west side of the bulge to escape. He gave the order to begin the march, and at dawn of February 4th the battered remnants of 7th Armored Division moved out across terrain as rough as predicted. At first it seemed the gamble might end in disaster after all. O'Connor, following in a staff car, saw with misgiving broken-down tanks all along the way. And there had been so few at the start. Would there be enough to do any good against the many divisions of Italians they were trying to cut off?

Fifty miles into the wasteland the going improved somewhat. The armored cars reached Msus, sixty miles from the coast road, by three in the afternoon. The next morning the armored cars arrived at Antelat about 10:30

and sent detachments to Beda Fromm on the coast road — and also, in case they were too late, to Sidi Saleh, further south on the same road. By noon armored cars and one lone battery of Royal Artillery had blocked the road. They were just in time. Thirty minutes later the first Italian trucks came into sight. All afternoon the little British force fought when truck convoys appeared. But the first tanks of 7th Armored Division had reached Antelat — still some miles from the coast road — by 4:30. They were ordered immediately to move toward Beda Fromm and take the Italians now coming in packed masses with accompanying tanks, down the coast road. They arrived not a moment too soon. The Italians were halted before they could overwhelm the tiny blocking forces of armored cars and artillery.

The next morning, February 6th, the Italians mustered their forces for a determined attempt at breaking through. The British armored force had only 4 light and 19 cruiser tanks. By noon they had destroyed 40 Italian medium tanks. But the Italians had 50 more — and the British were now down to 15. All British tank reinforcements had stopped miles away, short of fuel.

Attack followed attack, and still the British force held. Finally 30 tanks broke through and headed for the lighter British force further south. No more than four got through. The Italian Tenth Army was no more. In ten weeks O'Connor and the Western Desert Force had advanced 500 miles, much of it over "impassable" terrain, had attacked at odds nearly 10 to 1 against them, and had, at the cost of barely 2,000 total casualties, captured 130,000 prisoners, 400 tanks, and 1,290 guns. All that were left of the more than a quarter million Italians in North Africa were four badly demoralized divisions at Tripoli and one weak Italian regiment at Serte, half-way there.

That had been accomplished by February 7th. O'Connor and Wavell begged to go on and finish the Axis in Africa before the Germans could come in. But on the 13th Churchill himself had ruled that there would be no further advance. The troop shipments for Greece must begin immediately.

One day before that, February 12th, General Erwin Rommel had landed in Tripoli.

What followed was a sad story of missed opportunity and poor judgment. British troops in Greece (many of them the cream of O'Connor's Western Desert Force) arrived on line just in time to start a disastrous retreat in which many men and most of the tanks and equipment were lost. O'Connor had been sent back to Cairo for a much needed rest, his crack desert troops replaced by raw replacements.

Rommel was ready to attack by March 31st — long before anyone had thought possible. Cautious at first, he soon found almost nothing in front of him and began the first of his lightning attacks, even retreating O'Connor's steps in reverse around the Jebel Achdar by sending armor through the "impassable" Msus-to-Mechili route.

O'Connor was hurriedly sent back to advise General Neame, who had been left in charge. On a desperate night journey the driver of the two generals became lost in the dark and ran into a German patrol operating behind British lines. Both generals were captured. Thus history would never have the opportunity of recording the Superbowl of armored desert warfare — Richard O'Connor versus Erwin Rommel.

### Enter Rommel

When Wavell had been asked how soon the German reinforcements coming into Tripoli would be ready to undertake an offensive, he had estimated the British would have until May before any serious move against them could be started. As a matter of fact, he was just about on target according to the German high command's reckoning. But both Wavell and the German high command had estimated without taking into account the "Rommel factor" — made up of about equal amounts of driving energy and irritable impatience. This impatient drive had been a main factor in helping the Germans break through the French position in 1940. It was Rommel's energetic driving of his own 7th Panzer Division in a hectic all-night movement that had unhinged the French line and made their surrender inevitable. Now that he was commanding, in effect, operations in an entire theater, "conventional" estimates would have to be corrected by this new "Rommel factor."

His first tentative attack retook El Agheila. One week later he received permission for a small "raid" against British forces (as O'Connor had originally started out on such a "raid" and ended up advancing 500 miles and destroying an army). Expressly forbidden to "turn the corner" of the bulge and advance to Benghazi, Rommel, when things started going his way, did not even settle for Benghazi, but set off across O'Connor's old desert route in an attempt to cut off the entire British army in Cyrenaica. And he very nearly did it. Irrked at how slow and methodical some of his regular commanders were in their moves, he enlisted visiting generals in whom he had confidence as commanders of scratched-together "columns." And with the same kind of improvisation O'Connor had shown, within a week Rommel was across the base of the Jebel Achdar bulge and seeking to close the coast road and trap the retreating British.

It had been a comedy of tragic errors on the 3rd and 4th of April, with both the British and German columns getting lost, running out of fuel, and losing all contact with their units at crucial moments. The difference between the two armies had been Rommel. The British retreat had been so confused that the 7th Armored Division's 3rd Armored Brigade had marched and counter-marched for many wasted miles and ended by losing an entire brigade of tanks (almost all knocked out by mechanical failure, rather than by enemy action). Rommel, growing disgusted at the many foul-ups of his columns,

had finally placed himself at the head of the main one and drove through the night, headlights blazing until air attacks forced him to black out the column, to reach Mechili early the next morning.

But General Morshead's Australian division had held together and retreated along the coast road, fighting a stubborn rear-guard action. Aided by the newly arrived 3rd Indian Brigade, which moved into Mechili and fought there a determined battle to the end, the Australians managed to extricate their division and arrived in reasonably good shape at Tobruk.

Though he had never really had permission to proceed even as far as Benghazi, Rommel had no idea of stopping now that he had come out the other side of the bulge and was approaching Tobruk. He immediately mounted probing attacks on Tobruk on April 11th and 12th and sent other units on past toward the Egyptian frontier. Rommel had seen pursued troops in such circumstances collapse in Poland and France, and he expected the same thing to happen here if he pushed fast and hard enough. But General Morshead and the Australians had different ideas. The probing attacks were repulsed. Then some hurriedly scraped up troops sent out from the British rear area in Egypt stopped the German advance units just behind the frontier at Sollum.

Rommel knew he would have to knock out Tobruk if he were to try to continue his advance with such small forces. So he returned to Tobruk and set up a full-scale attack there for the night of April 13/14. His infantry broke through the perimeter and anti-tank ditch, allowing two panzer battalions to enter carrying more infantry. The Australian infantry had been directed to concentrate their fire on any attacking infantry and to leave the armor for the artillery and anti-tank guns behind them. Thus in the morning when the panzers drove deeper inside the perimeter, they were stripped of their infantry; there was no panic among the Australians; and the drive was stopped with the loss of 17 German tanks. The German infantry had lost heavily and 250 of them had been captured.

About two weeks later, from April 30th to May 2nd, Rommel tried again — this time with more troops from the western side of the Tobruk perimeter. Once again a breach was made and the tanks went through — but once again, the Australians refused to panic or surrender; the infantry stayed put and fought the attempts to widen the breach; the tanks found themselves fighting a determined force using its artillery with deadly effectiveness. The tanks ran into a minefield behind the forward infantry positions. By the end of the day, of their 81 tanks committed, only 35 were still fighting. Losses among the German infantry and mine-clearing engineers had been heavy. It was obvious the Australians were in Tobruk to stay awhile. More troops were being landed in the port, and Rommel knew he would have to stop and await the build-up of his own force and the improvement of his supply situation before more could be done.

The situation was temporarily stabilized on both sides. Pressure from Churchill led to a brief and unsuccessful attempt by the British to take offensive action. Called "Operation Brevity," it lasted little more than a day before it was broken. Both armies paused, hoping to rebuild faster than their opponent.

## "Battleaxe"

Churchill was still demanding fast action. He had bulldozed his military advisors into trying to run a convoy of five fast merchant ships carrying 300 tanks and some fighter planes through the Mediterranean. Against their better judgment, they finally had agreed. One ship with 60 tanks and 100 fighter planes was sunk, but the others got through. Wavell now had what looked to Churchill like overwhelming power in armor. Rommel, however, now had, in addition to the tanks of the 5th Light Division, a new panzer division, the 15th, and together the two divisions contained nearly two hundred of the generally superior German tanks. In addition, Wavell informed Churchill that the new tanks had arrived from England with a number of defects which had to be corrected to make them battle-worthy, and the troops who would man them desperately needed more training before matching themselves against the highly trained and experienced German armored force.

Churchill was adamant. He felt he had done his part in getting the tanks there. He desperately needed a victory for morale purposes on the home front. He pushed Wavell into precipitate action. "Battleaxe" was finally set for June 15th.

Battleaxe was ambitious in its long-range goals: defeat of the German troops holding the narrow bottleneck at Halfaya Pass, just inside the Egyptian border; a race to Tobruk to break the German hold on it, and a final stage in which the British forces would drive to Derna on the coast and to Mechili inland. They were ambitious goals, but there was no way, given the state of British weaponry and training, that they could be attained. In actuality, both sides had about 200 tanks for the battle, and therefore troop training and battle leadership would make the difference.

The British forces had some success attacking Fort Capuzzo on the high ground above Halfaya Pass, defeating a German panzer battalion and taking 500 prisoners on the first day. But the German defenses in the Halfaya Pass area remained firm against all assaults. And the British 7th Armored Brigade, attacking wide around the left flank, ran into hard going. They attacked a number of times, gaining some terrain, but losing tanks in doing so. Then at the end of the day disaster in the form of an ambush struck a large group of the new Crusader tanks which Churchill had just sent at such cost. The Germans had cleverly constructed a trap of dummy vehicles; 17 Crusaders were hit — 11 permanently knocked out. The day ended with 5th Light, rushed up from the rear, entering the tank battle. After a long-range exchange of firing,

both sides retired for the night. The next morning the 7th Armored Brigade, even after a feverish attempt at repairing tanks through the night, had only 48 ready for battle — about half their strength had been lost in the inconclusive fighting.

Yet the Germans too had had losses. The German 15th Panzer Division had received rough treatment and was considering retreat. Rommel, however, had different ideas. One of his continuing advantages in the desert campaign was British use of radio — little discipline was imposed, and by listening in on the traffic, the German intelligence could construct a fairly accurate picture of how the British were viewing their own situation. Rommel felt the British had suffered as much or heavier damage than his forces, and he determined to hold out and strike again with his recently arrived 5th Light Division around the desert flank to the south, while 15th Panzer attacked toward Halfaya.

In the morning, the British attack on the high ground above the pass made some gains, reaching Sollum behind the German Halfaya position. But the Germans there held off an attack on their front, even as they were being isolated from behind. British 7th Armored Brigade, meanwhile, had a running battle with 5th Light Division as the latter tried again and again to outflank the British. They were beaten back each time, only to reappear further out on the desert flank, until the battle had ranged all the way out to Sidi Omar. But when darkness had brought that part of the battle to a close, 7th Armored Brigade, at the end of the second day, had again had their number of tanks more than cut in half — 27 had been lost, only 21 were still capable of fighting.

On the morning of the 17th, unit leaders of both sides were again pessimistic. The German unit at Halfaya, though holding out so far, could not last much longer without being supplied. German supply columns were also having severe losses from British air attacks. But Rommel, relying on such evidence as an intercepted radio request for a senior commander to come up to discuss the situation with the 7th Armored Division commander, felt that the British would collapse if pressure was applied just a little longer. He directed his 15th Panzer Division to skirt the eastern edge of the 4th Indian Division and move toward their rear. He also ordered 5th Light Division to march from Sidi Omar, deep out on the desert flank, toward Sidi Suleiman, which would place them directly behind the British forces above Halfaya. The British 7th Armored Brigade, now reduced to a few tanks, could not stop them, and by eight in the morning the Germans were at Sidi Suleiman. Wavell went up to see whether the battle should be continued, but by the time he had arrived, the commander there had had to start to retreat in order to save his units from being cut off. Seeing there was no other choice, Wavell ordered the entire British force to retreat behind the border. Rommel attempted to move his forces fast enough to cut off the



British, but they made good their escape.

The battle was over. The British had not gained any of their goals. They had lost 93 tanks to the Germans' loss of 50. And because the Germans controlled the battlefield the end, they could not only recover most of their own tanks, but many of the British as well. Furthermore, the British were in poor condition to repel a continued attack by Rommel. But though the victory was his, Rommel did not have sufficient strength yet to begin a major offensive, especially with an armed and dangerous Tobruk sitting alongside his precarious supply line.

Churchill had gained one thing. He could use the battle as a final reason to relieve Wavell of command, sending him to the southeast Asian theater and replacing him with the commander-in-chief in India, General Claude Auchinleck. Wavell went to assume his new duties without protest. He had not even been granted a few days' leave in England. (Some commentators have implied that the Prime Minister didn't want him talking too much to reporters about what had been happening during his difficult tour of duty.) Considering that Wavell had had to fight a war against Italians and Germans in the western desert, another campaign against nearly a quarter million Italians in East Africa, an uprising in Iraq, and an expedition into a hostile Syria, plus what should have been seen from the first as a hopeless reinforcement of Greece — and to do it with very inadequate resources in the face of constant criticism and unwise orders and "advice" from political leader, historians have come to see the strangely silent but cool and effective British theater commander as one who had accomplished the nearly impossible for his country with little thanks in return.

## The Build-Up

From this point in the campaign until mid-November, there was a general cessation of major military moves (one brief "raid" by 21st Panzer Division to seek out and run off with a supposed British supply dump gained nothing for Rommel except heavy losses from artillery and air attacks). The main factor on the German side at this point was Hitler's favorite major operation — the invasion of Russia. Once this was started all support and supply had to be directed east in this mammoth attempt to overrun the sprawling nation of millions in a few short months. Thus Rommel had absolutely no priority to reinforce his troops for a major campaign. Therefore he waited, trained his troops, and made plans for a final major assault on Tobruk — this to be undertaken only in mid-November. He had, however, solidified his command over operations in the theater, being appointed as commander of Panzer Group Afrika, with the Afrika Korps, under General Cruewell, as merely a part of the command. The armor of Rommel's force was now made up of two German panzer divisions, the 15th and 21st (formerly 5th Light), and two Italian armored divisions,

Ariete and Trieste. The infantry included four Italian divisions and one German division, plus some separate "garrison" troops. The leadership of the Axis force, then, was well-centralized under the command of an experienced and, some would aver, brilliant leader.

The British, however, were in a completely different situation. After Churchill's game of musical chairs had been completed, the British North African theater was in the hands of a new commander with no experience in armored warfare. The Western Desert Force had now become two full corps, the XXth, which included most of the armor (7th Armored and 1st South African Division, plus two brigade groups — 2nd and 22nd), and the XIII, primarily infantry (2nd New Zealand and 4th Indian Divisions, plus 29th Indian Brigade Group). There was also the garrison in Tobruk, made up of the 70th Division and 1st Polish Brigade Group. Finally, there were two Army Tank Brigades (with "I" tanks made for operating with the infantry), the 1st with the main forces and the 32nd within Tobruk.

The British command structure was fortunate in one way. Its commander-in-chief, General Sir Claude Auchinleck, was new to his post and had had no armored warfare experience, but he quickly turned out to be no patsy for Churchill. He was a formidable man, tall and imposing in appearance, but even more impressive in his simple honesty, integrity, and straightforwardness. He quickly made it clear that his judgment about the state of things was not that different from Wavell's. He would not throw his troops into a major campaign until there were sufficient tanks, supply, and personnel. Thus, although the Prime Minister again was champing at the bit (and, it must be admitted in his defense, sending reinforcements as fast as he could get his hands on them), it was mid-November before the long-awaited clash could be brought off.

For commander of the army in the field, Auchinleck had chosen General Sir Alan Cunningham, who as commander in the successful campaigns in East Africa had captured tens of thousands of Italians. He was completely new to the North African army, however; and more importantly, although he was now going to be asked to command the largest armored battle in British history, he was entirely without experience in the use of armor (The East African campaign had involved only relatively small numbers of troops, practically all infantry). Auchinleck has been faulted for this choice, yet except for O'Connor, now sitting in a prisoner of war camp, there simply was no one at the high command level who *had* had experience in the kind of wildly maneuvering armored battle which was about to be unleashed by both sides.

A quick summary of tank and air strength on both sides at the start of the operation now named "Crusader" shows them equal in some ways (188,000 British to 119,000 German and Italian), but with an

apparent advantage for the British in aircraft (532 to 342) and medium tanks (610 to 330). These figures, however, are somewhat misleading, as among the British "medium" tanks are included 173 American Stuart (or "Honey") tanks which, although armed with a 37-millimeter gun (nearly equal to the British medium tank's 40-millimeter "two pounder"), were really intended as "light" tanks. On the positive side, however, the figures do not include 101 tanks inside the Tobruk garrison, and these could be of potential use in a battle in the area. Also the British had 180 tanks being repaired or in reserve, and another 240 on the way around the Cape and coming up through the Suez Canal. Rommel, because of the demands of the Russian offensive, could count on almost no tank reinforcements.

Thus for once the British should have had better than the slightly favorable or even desperately unfavorable odds of their previous battles in the western desert. However, the mere counting up of tanks and airplanes leaves out perhaps the most important factors involved in previous British defeats. First, there was the now admitted inferiority of the arming of their tanks. Here there is some disagreement, but it was clear that the British medium tank, armed with a mere 40-millimeter gun, discouraged its crews when their shells bounced off the German Mark III's (mounting a 50-millimeter gun), and especially off the newer Mark IV's (wielding a short-barreled 75-millimeter cannon which, using high explosive shells, was a danger at ranges far beyond those at which the two-pounder was less than useless).

Perhaps more important, however, was the use of anti-tank guns. The main British anti-tank gun, the same ineffective two-pounder used by the tanks, was not much of a threat to the German medium tanks. The Germans, however, had two highly effective weapons: the regular 50-millimeter long-barreled cannon, capable of stopping anything the British had at fairly long ranges, and second (but of increasing importance) the now famous German "88." Originally an anti-aircraft weapon and in rather short supply, its effectiveness against tanks, especially at longer ranges, was quickly realized, and it was made great use of in tank battles. The British, it might be noted, had a similar gun, their own 94-millimeter anti-aircraft gun (which even looks surprisingly like the early German 88, with its long barrel and high profile). But it is a measure of British stodginess and resistance to change that use of this fine weapon as an anti-tank gun was never given serious consideration.

But weapons again do not tell the whole story. Tactical use and battle leadership were perhaps even more important factors. First, the British seemed to think of themselves as medieval knights racing off to chivalric battle. They tended to keep their armor separate from other arms, and when they committed their tanks to a major clash, sent them dashing off across the desert after the "crusading knights" — usually toward disastrous consequences. The Germans, on the other hand,

never thought of the contest as a matter of individual "knightly jousts," but kept their units integrated — tanks, anti-tank guns, artillery, and infantry closely coordinated. On seeing British tanks racing toward them, their standard tactic would be to retire behind a screen of anti-tank guns, which then would set up a "gun line" capable of destroying the British tanks well before they were in close enough range to do any damage to the German tanks. And the British for a long time continued to think they were being destroyed by "tank guns" when in fact their nemesis was the far less costly anti-tank gun.

Finally, there is little doubt that for a long time battle leadership was a very important factor. German leadership, as displayed especially by Rommel, was highly energetic and "up-front" (Rommel customarily would be riding near the point of his main armored thrust). Therefore decisions could be made quickly and with immediate reference to rapidly changing circumstances. The British commanders, on the other hand, tended to operate more traditionally, with a command post somewhat to the rear of the rapidly moving tank columns. Thus, especially with the radio difficulties which so often occurred, the commanders would be out of contact with their main combat strength for long periods of time, unaware of how the battle was going, what both their own and enemy losses were, and even where their tank units might be. In such a situation orders would often be given when they were hopelessly outdated by events; unit commanders in position to do

damage to the enemy might sit without taking action until the moment for victory was past; or they might suffer tremendous losses and be pushed into precipitate retreat without higher headquarters knowing anything was happening. Often whole supply columns or entire combat units would then be caught and destroyed or captured before higher commanders even knew there was a crisis situation. And the one British commander who was aware of the proper kind of leadership needed in armored battle (General O'Connor) had been taken off the board months before by a sleepy driver losing his way on a night drive.

## "Crusader"

"Crusader" was perhaps the most fascinating of all the desert battles. It was so confused that even forty years later it is difficult to be clear about all the actions — and nearly impossible to understand precisely why they were taken. It was fought on one of the largest and most open battlefields of history, with tanks and vehicles able to maneuver at will over almost all of the hard-packed gravel. Armored formations marched and countermarched across the terrain, following orders or counter orders, attacking or being pursued by other armored units, while hundreds of thin-skinned supply vehicles swarmed about the landscape, sometimes finding the units which depended on them to go on fighting, sometimes getting lost in the

hundreds of square miles of part empty space, part burning junkyard. Unimportant points on the often featureless landscape could be empty one moment — and an hour or two later be the scene of a desperate armored struggle, with units racing there from all directions. One spot on the map started out as an Axis airfield, then became a conflagration of tank, artillery, and infantry units, reverted to an open expanse of terrain (except for the carcasses of discarded vehicles scattered about) — and then later became the setting for another mad contest between many completely different units. The battle went on for three weeks before anyone could tell what the result would be, and the decision was finally as much a matter of logistics and leadership "chemistry" (how much despair can a man take and still not lose hope?) as it was of tactics. It was perhaps symbolic that both sides captured major headquarters units, leaving whole segments of the armies to go on clawing at each other like decapitated animals whose appendages went on struggling when there no longer was an eye to see and a brain to plan.

At the beginning, both leaders had pictures in their heads of what was most important, and they continued to act as if those pictures reflected reality — long after those pictures refused to correspond to anything in the real world. Rommel, for instance, was so intent on the attack he was about to launch against Tobruk that he refused to respond appropriately long after subordinate commanders had recognized the need to change plans. Cunningham, on the other hand, had carefully plotted out what Rommel would do when the British reached their first objective — and he was completely at a loss when the German commander largely ignored the British "victory" and went on with his own delusions.

To Cunningham the goals were simple: hold with the XIIIth Corps (largely infantry) on the Egyptian frontier while the XXXth Corps (with most of the armor) made a wide sweep around the southern desert flank to Gabr Saleh (little more than a crossing of paths in empty desert). His tanks arrived there by the end of the first day — and nothing really happened. There he was, starting a war and nobody was coming. So on the next day (November 19th), he ordered his armored column to push on toward Sidi Rezegh, an Axis airfield not far from the southeast corner of the German Tobruk positions. Then things did begin to happen. Half of 7th Armored Division's tanks (7th Armored Brigade) went as directed (perhaps because no one was in its way) and overran the airfield, destroying 19 Axis planes and throwing a scare into some of the German and Italian forces investing Tobruk, as the armored brigade threatened their rear areas. The 22nd Armored Brigade, however, bumped into tanks of the Italian Ariete Division and ran off to attack them, losing 25 tanks, mostly to anti-tank guns, in the process. The Italians were not unscathed, however, losing 50 of their inferior tanks, 35 of them permanently knocked out.

Meanwhile, a separate armored brigade (the 4th) ran into some armored cars of 21st Panzer Division and chased merrily off after them. When they approached 21st Armored Division, however, its commander was allowed to release 5th Panzer Regiment to attack the British brigade. Thus an armored battle was indeed fought near Gabr Saleh, about where Cunningham had planned (but not as he planned), and the result was some tank losses on both sides — but as the British withdrew from the battlefield as it grew dark, they had to leave 23 damaged "Honeys" behind. Things did not look too promising for the British to anyone who knew the whole picture. Only no one knew the whole picture. From air reports of traffic movements, Cunningham that night deduced (incorrectly) that the Germans were retreating *en masse* (the "movement" had been merely some of Rommel's forces assembling, as previously planned, for the Tobruk assault). Feeling victory already in his grasp, therefore, Cunningham planned to finish off the enemy the next day.

The Germans, however, finally recognizing a major battle was on, could see little pattern except that British armor seemed to be scattered over 60 miles or more of desert terrain, and therefore determined to clean up these forces piecemeal. The 15th Panzer Division was ordered to Sidi Aziez to begin the clean-up with a major British tank formation reported there, while 21st Panzer Division moved to cut off its retreat. It was not a good start. Sidi Aziez was about 40 miles northeast of the Gabr Saleh tank action — and there was no British tank force there. To cap the farce, 21st Panzer ran out of fuel before it could even get into position to cut off the mythical tank formation.

The British, beginning to realize that their 4th Armored Brigade was somewhat isolated at Gabr Saleh, ordered 22nd Armored Brigade there as support. This unit did not arrive before the Germans finally got straightened out about where the real British tanks were. Thus the 4th Armored Brigade again had to take on most of the German armor alone, losing 26 more Honeys before withdrawing for the night.

At the Sidi Rezegh airfield, meanwhile, 7th Armored Brigade could see they were going to need infantry and artillery to cope with German infantry and artillery that was building up all around them. Jock Campbell's 7th Support Group arrived to give some of the help needed, but nowhere near enough. So 5th South African Brigade, far to the south, was sent for. But it would clearly be some time before they could arrive.

By November 21st, Rommel had changed his fixation from attacking Tobruk to preventing it from being relieved. British forces at Sidi Rezegh were not far from the port's isolated garrison. Therefore Rommel called his two panzer divisions away from Gabr Saleh to stifle the British threat from Sidi Rezegh. And the threat was becoming real. The Tobruk commander had been told to link up and try to join up with the relieving force. Troops there made a successful beginning, cutting

more than a two-mile chunk out of the German and Italian perimeter. Jock Campbell's small infantry and artillery force attacked at Sidi Rezegh and captured twice their number. A tank regiment sent to join up with the tank-out forces was stopped (by 88's Rommel himself had positioned) as soon as it reached the high ground, losing three-quarters of its tanks before it could retire.

The 15th and 21st Panzer Divisions broke off action at Gabr Saleh and moved north toward the airfield as ordered. There followed a strange running battle — with the two German panzer divisions racing north between the two British armored brigades, who were following along and seeking to do serious damage to the two German divisions. Reports of this action were only further evidence, in Cunningham's mind, of the fact that the battle was won and the Germans were madly retreating. But with their gun-line defense, the German armor was not at all seriously hurt during this race. And as the panzers closed on the Sidi Rezegh position, they eliminated most of a second tank regiment of the 7th Armored Brigade. This brigade was thus through as a coherent unit. But there was pressure on the panzer units from their rear, as 4th and 22nd Armored Brigades closed from the south.

At the end of the third day of battle neither Rommel nor Cunningham knew much of what was really transpiring. Cunningham still saw himself as the victor and ordered XIIIth Corps infantry to start moving around German garrison forces still on the Egyptian frontier and strike out west toward Sidi Rezegh. Rommel too was concentrating his troops in the Sidi Rezegh area to prevent any tie-up with the Tobruk garrison. It was clear a major clash would occur near the site of the former Axis airfield. About noon on the 22nd, Rommel himself planned the assault on the Sidi Rezegh position. The few remaining pieces of 7th Armored Brigade's tanks were knocked out. Now there was only the small force of hard-fighting infantry and artillery left. Then 7th Armored Division's second brigade (the 22nd) attempted to bring support. They reached the area — only to be completely devastated by anti-tank gunfire, tank after tank flaming up as it was knocked out. The artillery and infantry in the area on the ridge above the airfield, now bereft of armored support, finally had to surrender. The 4th Armored Brigade Group tried to reach the airfield, but were stopped short. However, their attempt did create enough diversion to allow the remnants of the other units on the airfield to escape and set up a new line with 5th South African Brigade south of the airfield. Then to finish a rather gloomy day, during the night the one British armored brigade with any real tank strength left (the 4th with 100 tanks) had its headquarters overrun by accident, leaving the solid tank force without coherent leadership for the next day of battle.

Cunningham, however, out of contact with most of the action at Sidi Rezegh and seeing his XIIIth Corps making good progress

past the frontier and toward Tobruk, still was feeling completely confident. He continued the policy of urging his infantry east and north toward Sidi Rezegh. He had no way of knowing his total tank strength now had sunk to 144, while the originally outnumbered Germans still had 173. Gone was the numerical superiority. The truth would hit him only later — made only more devastating because of his former delusions of victory. Rommel, on the other hand, present during the hot action at Sidi Rezegh, was beginning to sense that he was gaining a solid advantage.

November 23rd opened with remnants of many British units south of Sidi Rezegh, out of contact with each other and higher headquarters, waiting for the arrival of the infantry (2nd New Zealand Division) from the frontier to the east. Then a major break came to the British. It was the Germans' turn for the unlucky accident. The advancing New Zealand Division bumped into and captured the Afrika Korps headquarters — leaving the commander Cruewell with only his tactical control personnel.

Rommel's plan for the day was to destroy all British presence in the area southeast of Tobruk by converging upon it from both north and south. Part of the 15th Panzer struck swarms of thin-skinned supply vehicles beleaguered south of the British position below Sidi Rezegh. These scattered in all directions, while all British guns and tanks reacted with a hail of fire. Strangely enough, despite the lack of control on the British side, the 15th Panzer, attacking north, was hit hard by 1st South African Brigade in its rear, 5th South African Brigade and remnants of 22nd Armored Brigade ahead of it, and groups from the recovering 4th Armored brigade on its east — all pouring fire in its direction. Losses were considerable, especially from artillery. Finally the German assault got under way and after heavy fighting completely overran 5th South African Brigade. But the British were fighting all the way and the victory was not cheap. The entire Afrika Korps was now down to only 90 tanks. And the New Zealand infantry made progress and even briefly connected up with the South African Brigade before its decimation. Now there was another British force taking position near Sidi Rezegh.

That night Cunningham finally began to see what a drubbing he had taken in the armored battles. The reports were even worse than the reality. Shaken, he asked Auchinleck to fly up to consult with him concerning the possible calling off of the battle. "The Auk" came and, stolid and unflappable, calmly considered what was known. Some of the staff were not as pessimistic as Cunningham. They knew they were hurt, but they thought the Germans had been hurt also. Auchinleck assumed full responsibility and took the risk. The battle would continue; the goal would be to prevail on the battlefield and reconquer Cyrenaica.

Rommel was now buoyantly confident — enough so to take an even greater risk. He ordered the Afrika Korps to leave the immediate battle area and head for the

Egyptian frontier, where he could bring support to his garrison there, pursue his "defeated" enemy, and destroy supplies. It was a bold decision involving great risk — but the kind of decision that in the past had driven his opponents into a state of panic as he appeared far in their rear areas.

The daring plan was carried out on the morning of November 24th. Rommel led the way with Afrika Korps' two panzer divisions. Disengaging from their other battlefield, they were battered from both flanks by British combat forces. Then they ran into the hordes of British supply vehicles, causing a panicky rush for the rear that was always referred to later as the "Matruh Stakes." It was panic — but it did not affect the combat troops and cost the British little beyond their scare. Rommel's troops maneuvered about near the border for two days without accomplishing much of anything. Communications were bad — not helped by the earlier capture of Afrika Korps Headquarters. Finally, on the 26th the panzer divisions withdrew, stopping at Bardia on the coast for fuel and ammunition.

While the German armor was absent the New Zealand infantry was approaching the Tobruk area. Finally, on the night of November 26/27, they met the troops from Tobruk, who had broken out as far as Ed Duda. Realizing he still had a battle going on back where he had left it to "pursue" the foe he had "written off" a bit prematurely, Rommel on the 27th sent the panzers back toward Tobruk.

While Rommel had been gone from the main battlefield, the British had been recovering. Auchinleck finally decided to relieve Cunningham, who many now considered badly shaken by his sudden awakening from his dream of quick victory into a hard reality of heavy losses and deep uncertainty. Auchinleck appointed his Deputy Chief of Staff, Major-General Neil Ritchie, to take Cunningham's place, but took most of the responsibility himself for the rest of the Crusader battle. And not only the command situation had improved. Badly mauled or widely separated units were beginning to reassemble and sort themselves out. Despite heavy losses, morale was still high. After a battlefield salvage operation, on the 26th the 4th and 22nd Armored Brigades had a total of about 120 tanks operating. When they received word Rommel's panzers were returning to the field, they attacked from front and flank and came near to defeating the now vastly understrength German formations. Darkness fell and the Germans managed to keep going to gain protected positions near that same airfield which had been the scene of so much hot action a short time before — Sidi Rezegh. On the 28th both sides rested without major action. They were both getting ready for a second Battle of Sidi Rezegh.

The Germans gained little advantage in fighting near Ed Duda on the 29th. Although the Italian Ariete Division did a little better. Also on the 29th panzers overran a New Zealand brigade at Sidi Rezegh, but the latter fought so hard there the losses were heavy for

the Germans as well. Early on the 30th the tie-up between the British and the Tobruk garrison was again broken. Fighting continued on the Sidi Rezegh airfield. On the night of December 1/2 the New Zealander commander decided he would withdraw and did so, slipping around 21st Panzer Division. Once again the Germans had won Sidi Rezegh. Once more Tobruk was cut off.

Rommel still felt confident. He had had serious losses, but he felt the British had had more. Auchinleck, however, was not pessimistic. While hurt, he knew Rommel must be hurting badly too. And the British could reinforce and were doing so, building up new formations to the south of Bir el Gubi. Two columns which Rommel attempted to send to support the German garrisons on the Egyptian frontier fell into an ambush and were almost completely destroyed. The German commander had to begin to face it — despite his great tactical victories and heavy destruction of British armor, his opponents could win the battle of re-supply. If they would not panic in spite of all he could do to terrify them, he would have to leave Tobruk and the present battlefield.

Then he received an answer to his request for equipment and ammunition. There would be nothing till late in December — if then. It was no use. He would have to withdraw over the same route the panicking Italians had taken before O'Connor. But this time it would be a Rommel operation, with rearguards operating effectively and no panic on anyone's part. By January 6th the last of Rommel's forces were back at El Agheila.

The long "Crusader" battle was over. The British had finally won — though Rommel had chopped their odds down badly and nearly taken the victory. Only the calm, cool leadership of Auchinleck and the fighting power of individual British small units had staved off crushing defeat and made the final victory possible. A totting up of final figures show that the British lost 15% of their force, the Germans and Italians 32% of theirs. So despite the heavy tank loss by the British, it seemed that there had been a real victory here after all.

## Rommel's Road Back

The situation after the Crusader "victory" was actually far from optimistic from the British point of view. Rommel had not been pushed to Tripoli and out of Africa. At El Agheila, given even reasonable odds, he could advance a few miles and "turn the corner" again, leaving open the possibility of an attack on Benghazi or an even bigger sweep across the old O'Connor route and right back to Gazala and the Tobruk area. And other factors were working in his favor.

Greece had been the spoiler for O'Connor. Now it was the Far East for Auchinleck. Following the German retreat at the end of the Crusader battle, events far from the area took place which would seriously affect the Middle East. Pearl Harbor had been bombed and the Japanese were in the war, and now British Far

Eastern forces had to be bolstered. The bolstering would have to come, in considerable part, from the one active British theater — North Africa. Two divisions were lost immediately. A much-needed shipment of airplanes and anti-tank guns was diverted to the Far East. Auchinleck was asked to give up tanks, and knowing the needs of the Far East from his former position there, he generously gave up over a hundred — more than had been asked for.

Another factor was two convoys of reinforcements for Rommel, escorted by Italian battleships. Almost in a matter of days the odds had changed. Although no one knew the figures for sure, an accurate tank count would have given Rommel the advantage — 196 (117 German and 79 Italian) to only 150 for the British (all with the new, untried 1st Armored Division, fresh from England).

When the odds swung in his favor, Rommel never hesitated to act. So on the 21st of January he started back. In a series of typically brilliant Rommel moves, he confused the inexperienced 1st Armored Division and Eighth Army's new commander Ritchie by advancing quickly to Msus, where he could move either west to Benghazi or east to the desert route to the Tobruk area. He feinted east and went west toward Benghazi. Ritchie had first agreed with his corps commander to evacuate that city and retire in good order around the bulge and back to set up a defense somewhat west of Tobruk. Then he changed his mind, told the 4th Indian Division to stay and defend Benghazi — only to see them completely cut off and surrounded there. By great courage and initiative, however, the Indian division cut their way out. Now there was nothing for it but to race all the way back to Gazala and try to defend the approach to Tobruk from there. The new 1st Armored, meanwhile, dazzled by Rommel's moves, had nearly disintegrated and was lucky to arrive, via the old O'Connor route, to Mechili and the new defense position. Rommel had started his new offensive on January 21st; by January 29th he had Benghazi and a clear route back to the old battlefield near Tobruk.

## Rommel at Tobruk Again

From February to May was a period of recovery, training and rebuilding for both sides. Churchill again began his pressure for immediate action, regardless of the state of troops or equipment. Auchinleck held firm in his demand that soldiers and weapons not be thrown away in any operation too hastily conceived and executed. He told Churchill that May would be the earliest he could move. Rommel himself wanted to attack immediately, but he needed troop and air reinforcement before he could consider it — and higher command in Germany was still too concerned with the Russian front to offer him any serious help.

Finally, however, Hitler did agree to an attack by Rommel, provided he would limit

himself to taking Tobruk and then going on the defensive. At that point the attack on Malta would take precedence over all other operations. This was good enough for Rommel. He always knew that when he had things going his way in a battle, Hitler could rarely resist allowing him to continue.

During the pause in operations the British, and especially Auchinleck, had done some re-examining of their failures. "The Auck" began the reorganization of British armor which was long overdue, leading to the integration of much more artillery into formations of armor. Unfortunately the appropriate tactical changes needed to supplement these developments could not proceed far with a conventional commander like Ritchie in charge of Eighth Army.

Rommel was the first to have his troops ready for an offensive. The British dispositions were conventional for a non-desert operation, but not especially well suited to a desert environment. Ritchie had a solid, mine-protected infantry line (of XIIIth Corps) running south from Gazala to Sidi Muttah, or about half the distance of the fifty-mile front. From that point a series of "boxes" had been set up, the Free French at the extreme left flank in the desert, and others in some depth to the rear, including major ones at Knightsbridge, El Adem, and Bir Gubi. Against Auchinleck's advice, Ritchie had again put most of the armor into a separate corps (the XXXth) with responsibility for the left half of the "line" — but he had scattered it about the whole left flank, rather than keeping it concentrated in the middle and ready to rush as a group to the point of attack. If surprise could be achieved, it was a situation made for the old Desert Fox. Rommel did not hesitate to accept the invitation.

At this time the British had somewhat favorable odds in armor. They had 850 tanks — but these included 167 of the new, heavily-gunned American Grants (with a 75-millimeter gun, though mounted in the tank chassis, rather than in the turret). Rommel's total strength in tanks was 841 (German and Italian), but the solid core of his tank force was his 280 German medium tanks.

On May 26th Rommel began his move toward the desert end of the line. At three o'clock in the dark of early morning, his force swung wide through the desert around the Free French box at Bir Hacheim, his huge mobile force arranged in its offensive "box" and making fast time on the open terrain. The British did not have adequate communications for warning their elements fast enough. Half the Bir Gubi box personnel, for example, had been released to go for a swim in the Mediterranean. The armored brigades of 7th Armored Division had no time to get to their prearranged battle stations. Around the desert flank Rommel came, swinging north toward Tobruk.

The 4th Armored Brigade was struck and swept through while it was still getting ready to move. Then there was a heavy loss of tanks and command structure as 7th Armored

Division Headquarters was overrun. The 22nd Armored Brigade was sent to the support of the 4th — only by this time there was no organized 4th Armored Brigade to support. It was perhaps of no matter, for even before the move could start Rommel was driving into it. It fought back hard and managed to retreat inside the shelter of the Knightsbridge box, in the middle of the battlefield. After the first day of real fighting, half the British armor in XXXth Corps was almost completely disorganized, and Rommel was approaching Tobruk, well behind the infantry-held northern part of the Gazala line. His situation was far from ideal though, for his tanks were out of fuel and his supply elements, far behind him, were being hit by attacks from some of the recovered British armor. Neither army seemed a highly organized force at this time.

In such a situation, the first commander to take control with a clear plan is the one to profit. Ritchie and his commanders waffled. Rommel changed plans immediately, abandoned the drive to Tobruk for the time being, and drove his forces back to the British side of the gap of uncovered minefield between Bir Hacheim and the infantry forces to the north. By the evening of the 29th, with two routes cleared through the minefield to the west, he had opened a direct path for supplies to reach him. The center of the "Gazala Line" was now in Rommel's hands. His control was then made more secure by overcoming the nearby 150th Brigade box.

For the first few days of June, the British could not agree on a suitable counter-move. Then, on the 5th of June, a British attack was formed. The infantry attacked and made progress in the very early morning. But the tanks were late, and the infantry were counterattacked. The tanks, finally arriving, drove three miles ahead of the infantry, and then were themselves hit hard by artillery. They fell back behind the infantry, leaving them to be slaughtered by a German force of combined arms.

A second British attack was hit in the flank by 21st Panzer Division. At the end of the day nothing had been accomplished and Ritchie had lost 110 tanks. On June 6th more efforts to attack were made — but they were piecemeal and ineffective. That was the end of the counter-stroke. In the two days British losses had included 160 cruiser tanks, 50 "I" tanks, an entire Indian infantry brigade, 7th Armored Support Group, plus four complete regiments of artillery. Yet Ritchie still thought things were not going badly and so advised Auchinleck.

Rommel next turned his attention to the isolated Free French box at Bir Hacheim. They fought back bravely, but had to be ordered to break out on the night of 10/11 June. There was now, in effect, no solid "Gazala Line."

Ritchie had little choice but to form a line of boxes at right angles to his original Gazala line, the northern half of which was now all that was left. On June 11th Rommel attacked north directly into the line's flank and also wide to the right. Another confusion

of British orders occurred, with the 7th Armored Division commander getting temporarily captured at a crucial moment, and Norrie, XXXth Corps commander, insisting on an armored attack into the 15th Panzer which was driving up from the south. Rommel knew of the move southward from wireless intercepts and was ready for it with concentrated tank and anti-tank fire. At this moment the 1st Armored Division commander arrived with his division, noticed the confusion and, against his wishes but obeying Norrie's orders, drove into the mess. Then the trap closed, a ring of fire struck them from every direction, and by the end of the afternoon the British armor had suffered a great defeat. And Rommel's forces, by that evening, had broken through the newly erected right-angled line and was nearing Tobruk.

On June 12th, Rommel isolated and attacked the central Knightsbridge box; it could do little but save itself by a night escape. Ritchie, still unruffled, was clearly losing all control of the battle. He finally ordered the Gazala garrison to retreat to the frontier. The northernmost South Africans went east along the main Via Balbia, but the 50th Division, much further south, had to break out toward the west and circle deep in the desert to arrive back in Egypt.

Then began a strange three-way misunderstanding between the army commander, his theater commander Auchinleck, and Prime Minister Churchill. There had previously been agreement that Tobruk would not be held again in isolation. Its defenses were too decayed, and Auchinleck could not, he felt, waste a whole division of troops for such a purpose. Yet, at this moment, Churchill began to send wires indicating the importance of keeping Tobruk under any conditions. Auchinleck tried his best to carry out the orders — but Ritchie had already started most of the troops on the way to the frontier. The upshot of the many messages passed among them was that Tobruk was left with a large number of troops, including an infantry division, two other infantry brigades, 32nd Army Tank Brigade, and a regiment of artillery. On June 14th, by holding a thin line made up of remnants of defeated units south of the main road, Ritchie made it possible for most of the vulnerable vehicles of the army to clear out of the collapsing Gazala line in what was called the "Gazala Gallop."

The new Tobruk garrison desperately attempted to make ready for Rommel's expected attack — but everything was in too much disrepair and disarray. On June 17th Ritchie tried to help out by sending up his last armored force, 4th Armored Brigade, with 90 tanks, most of them replacement tanks manned by old crews haphazardly pitched together to form one unit. It was like the last charge of a band of outmoded knights in clanking armor. They ran straight into the two German panzer divisions, lost 32 tanks, and had to return. On the 18th Tobruk was cut off. On the 20th Rommel began his assault on Tobruk's perimeter. By eight in the morning he was a mile and a half through the

perimeter, had captured the town by seven that evening, and the next day accepted the surrender of the entire remaining garrison (very few had managed to break out during the night). After a year and a half of battle he at last had the prize that had always eluded him.

But he hardly paused. Turning east he soon swept wide around the desert flank of the British frontier position. Ritchie retreated to Mersa Matruh. There he appeared to Auchinleck to have made a decision to fight to the end. He seemed relieved to have the decision over with.

It was an attitude and a decision Auchinleck could not afford to take. The theater commander started preparations for defending further back at El Alamein, then flew up to Eighth Army Headquarters with his friend and new advisor, the young and brash but innovative military thinker, Major-General Dorman-Smith. "The Auck" was a generous hearted man, loyal to those who served him, and it was not an easy thing to do. But as kindly as he could he told Ritchie that in the desperate situation nobody but he, the theater commander, could be saddled with the responsibility. Ritchie accepted the decision calmly and left for Cairo. Auchinleck would recommend him for other commands (though not independent ones), and Ritchie would later be a successful corps commander in Europe. Auchinleck himself set to work to see by what means, however inglorious they might appear to the public eye, he could keep a viable British army in the Middle East — and keep Hitler's desert hero away from the oil wells that lay in the crossroads to India to the east and Russia to the north.

## Auchinleck Takes Charge

On June 25th Rommel was already pounding at the door of Mersa Matruh. There was little Auchinleck could do now to affect the battle. Ritchie had already placed his units in two widely separated units, the two infantry divisions in the "fortress" (its defenses were no worse shape than Tobruk's) and 1st Armored Division and the New Zealanders some thirty miles south on the escarpment — with ten miles between these southern units. The Mersa Matruh position was a trap waiting to be closed; the southern units, after defeat and retreat for many days and nights, were a new disaster waiting to happen. Auchinleck knew only one thing. He was not going to let these pieces of an army be taken off the board. There had to be something to build a "line" with at El Alamein.

Rommel, given permission to place all his stakes on his drive to win the entire Middle East without waiting for Malta to be invaded, struck quickly where the opening had been offered. He drove through the vacant mantle and swung left and right to envelop both positions. Rommel's force was running on bluff and victory. He had only one tank unit, 2500 men with him. British 1st Armored had 150 tanks. But it was in no sense an organized

unit of trained fighting men ready for combat. When Rommel drove north of them they could have attacked his flank, as Auchinleck had given them general instructions to do some time previously. But Auchinleck had no communications with Gott, commander on the southern part of the field. The new Eighth Army commander hardly knew what units he had under his command at this point. So the southern units stayed fixed as if by the stare of a cobra.

Gott, now with too much defeat behind him to consider victory a possibility, first ordered the New Zealanders to fall back, and then instructed 1st Armored to do the same. Auchinleck, seeing the southern units had gone, sent orders to Holmes, commanding at Mersa Matruh, to fall back on El Alamein. It was now not that easy.

The signal was delayed by communications trouble for twelve hours. On the night of June 27/28, when Holmes tried to take his troops out to the south in bright moonlight, they ran into the full force of the German troops and were routed back into the Mersa Matruh position. Many of these men were completely inexperienced, having just arrived from Syria. In the south the New Zealanders, with the British armored force already gone, had to cut their way out that night first with the bayonet — then swarmed aboard their trucks and rode out through the German forces like mounted troopers in a cavalry charge.

The next day, June 28th, Rommel started his attack on the surrounded troops in Mersa Matruh. But by dark he had been kept still inside the perimeter. Knowing it was their last chance, before the moon had risen the British charged into the darkness and their attackers. In complete confusion the British stormed right through the headquarters of 90th Light; the British air came and bombed their own forces; everyone seemed to be shooting at everyone else, regardless of what side he was on.

The British finally broke into the open desert. The night was not, however, through yet. When they arrived at the passes which led down to the coast road, there was no 1st Armored Division there to hold them open, and they had once again to run a gauntlet of German fire. When they arrived at El Alamein they had lost twenty per cent of their force. Bluff, hard fighting, and fast movement had handed Rommel another startling victory. And the British would seem to have been set up for one last defeat which would sweep away all vestiges of British power in the Middle East.

Events were moving now toward a climactic moment — it would be the turning point of the war in the west. For the German failure at Stalingrad and the failure to cap their stunning campaign in the desert with another mere 60-mile advance to Alexandria could prove, in the end, to be their undoing. But Auchinleck would have to manufacture a defense that could stop the momentum of the victorious panzer army — and do it out of make-shift remnants and a smattering of new, inadequately trained troops.

## El Alamein

El Alamein, despite its being called a "fortified line," was mostly forty miles of empty desert — nearly the same as the army had been fighting in during the long retreat. There was a small fortified area on the coast at the town of El Alamein itself, then desert with a few small ridges (the largest, Ruweisat, was about ten miles inland), south of which another ten miles was Bab-el-Qattara, where the land began to get rougher (though still passable by vehicles and tanks), until it reached the great Qattara Depression, through which large vehicle movements were impossible.

Auchinleck's plan was to break up his division units into smaller "battle groups" containing lorried infantry and artillery. These units would have to do the main job, because the only real tank formation he had, the 1st Armored Division, had proven itself highly ineffective when facing German panzers. The battle group arrangement was actually a very sensible one, had already been used by the Germans in their panzer drives, and was later adopted by most western countries after World War II. Here it was a necessity. For though Montgomery later disparaged it, he could do so only because he had such tremendous superiority in men and equipment that he was never under severe pressure of the kind that Auchinleck had now to face.

The South Africans were placed in the Alamein box; the 18th Indian brigade was assigned to a new box, Dier el Shein, at the western edge of Ruweisat Ridge; the southern end of the line at Bab el Qattara was manned by three New Zealand brigades and an Indian brigade echeloned in depth. The 1st Armored Division, with its 150 tanks (but only two squadrons of Grants) would be held at the eastern end of Ruweisat, in a position to move either north or south. Then Auchinleck made an important shift. Stripping two South African battle groups from the Alamein position, he set them up north of the Ruweisat Ridge, where they could take in the flank any German force driving through the hole between the ridge and the Alamein position. This was where he expected Rommel to come, and he was right on target. Thus he had done what he could. The army waited quietly, facing the empty desert to the west.

On the morning of July 1st, Rommel struck. His plan was to send all his German troops driving into the British right center (where Auchinleck had anticipated he would), then turn 90th Light north to the coast to cut off Alamein and send the Afrika Korps armor south to take the southern position from behind.

The Indian box at Deir el Shein delivered unexpectedly heavy fire for the defeated force Rommel expected to meet. And the southern envelopment broke down here before it even started. The northern thrust went past the Indians and then was hit by the fire from the two South African battle groups, positioned just where they could do the most damage. The mighty panzer army, expecting to spend the night in luxury in Alexandria and Cairo, were pinned to the

ground and slept in exhaustion on the desert floor. Rommel, seeing the southern force stopped early, had shifted reserves to the north and come himself to lead the attack — only to be pinned down with his troops. He sensed a new hand was guiding the the British Eighth Army now.

Auchinleck, who had always argued that a passive defense in the desert war was unworkable, had planned an armored counter-attack. But his armor, well positioned to attack the Germans as they fought the Indians in the endangered box, had not been able to get into action effectively: one brigade had become bogged down in soft sand; the second was too late to do any good. So the Indian box had fallen. But the effective defense of the other British troops had kept the attack from breaking loose.

Auchinleck reviewed the success of the day and planned a more ambitious stroke for the next day. With the southern German drive stopped, he could send his southern troops, including the armor, skirting behind the Afrika Korps to reach the coast behind them, leaving them cut off from their supplies. It was a good plan and could have annihilated Rommel's army. But Eighth Army's troops were not yet up to his demands. The armor failed to skirt the German panzer force and bogged down. But the collision had upset Rommel's plans for the day as well. He had hoped to have all his armor in the north and driving past the Alamein position in a concentrated effort. They had spent the day fighting off an unforeseen attack. The Germans made some progress in the northern drive — but they were still far from a breakthrough. Rommel was down to 26 tanks. Nevertheless, he would push ahead for one more day. But Auchinleck, seeing his southern flank was now no longer threatened, could begin to shift troops north himself.

On July 3rd the Germans made progress along both sides of Ruweisat Ridge. But it was not enough. That evening Rommel gave orders to pass temporarily to the defensive. It had not been a good day for the Axis. The Italian Ariete Division, maneuvering in the south against the New Zealanders, had been hit by both New Zealanders and 1st Armored and had lost most of their artillery and tanks.

There was a pause on July 4th while both sides laid new plans. Again Auchinleck tried to get XIIIth Corps to move into an attack on Rommel's rear. On the 5th the movement started — slowly, except for the newly formed 4th Light Armored Brigade of armored cars. This unit broke through and created consternation in the German rear for a time. But XIIIth Corps could not move fast enough to take advantage of this break.

For July 8th Rommel had planned a new thrust through the south, and the effort had some initial success. But Auchinleck had plans also. He hit the Italian Sabatini Division near the coast with fresh Australian troops, sending the Italians flying and capturing their artillery. Rommel had to give up the idea of further attacks in the south and rest back to re-evaluate the situation in the north. It was the



beginning of a number of Auchinleck moves advised by Dorman-Smith: get at Rommel by striking and routing the Italian infantry. Yet Rommel still had hopes things would turn his way. He had been informed reinforcements would soon arrive — the entire 164th Infantry Division and 260 tanks.

On the 13th of July Rommel tried again, this time against the Alamein position. By the next evening the attack had failed. To make matters worse, that night Auchinleck's New Zealanders and Indians stormed the Italians on Ruweisat Ridge, routing the Brescia and Pava Division, recapturing the entire ridge, and taking many Italians prisoner. Rommel planned another Afrika Korps attack in the center, but again Auchinleck struck with a night bayonet attack and by the next day was throwing panic into the Italian Trieste and Trento Divisions. By July 17th it was obvious that Auchinleck had won a battle of great significance, and Rommel, always before energetic and optimistic, was becoming a sick and uncertain man.

Yet the rewards were not to go to Auchinleck. He planned an attack which could have finished Rommel for July 26/27. The first stage went well — and then the armor, which was to have been up with the infantry and ready to exploit the initial success, was not there. It was obvious there must be more training before the final victory with Rommel was won. But "the Auk" had stopped Rommel — and not, as events were to prove, only temporarily. He had devised a plan for keeping him stopped, even if he did receive reinforcements. And stopped he was, at the Battle of Alam Halfa — by use of Auchinleck's plan. But Auchinleck had been relieved of command on August 15th. The battle was fought two and a half weeks later, and the credit went to his replacement, General Bernard L. Montgomery.

## No More Crusades

The day of the knights of the desert was over, although not many were aware of it yet. Montgomery was perhaps what the Eighth Army needed. Filled with a sense of his own infallibility and possessing a talent for self-promotion, he did not like to take chances. He liked a "tidy" battlefield. Under him there would be no more wild charges across the desert — and no disastrous anti-tank gun ambushes. His battles would be "tidy" rather than brilliant. No move would be made until absolute superiority over the enemy was assured. Then events would proceed in a predictable manner. Even in pursuing a defeated foe, caution would always reign. It was the sure way to win — if you had the absolute superiority in troops and equipment he was always given. Much later in Europe, when he had to try something more ambitious and risky (in the Arnhem paratroop operation), the result was a botched show and heavy casualties. That was not a place for "tidy" commanders. But in North Africa, given the reinforcements he was about to be provided with, it was enough to be careful and tidy.

Auchinleck had left the plan to be used against any further attempt by Rommel to attack the Alamein position. He predicted the Desert Fox would come through the south this time. He did. "The Auk" devised an L-shaped line, running south from Alamein and then turning sharply east below Ruweisat Ridge. This line, at right angles to the Alamein line, would be manned by the armor, ready to take in the flank any Rommel attempt to flank the British line.

And that was the way the Battle of Alam Halfa went. Rommel's forces attacked and were devastated by the concentration of fire from anti-tank guns and artillery in protected positions. After taking heavy casualties, especially in higher officers, Rommel had to throw in the towel and pull his troops back to set up a tight defensive position. There were moments when Montgomery might have struck to eliminate Rommel once and for all. But that would have been too big a gamble. The battle was being won, slowly and by attrition. No brilliance was necessary.

And yet this battle, planned by others and provided him by Auchinleck, fought when Montgomery had been in command hardly two weeks, has been considered by many his most brilliant battle.

But now brilliance was not going to be required. A number of factors would very soon combine to make the German position in North Africa untenable. Malta had not been invaded — it had been Rommel's own request that he be given priority to invade Egypt and eliminate the British there instead. He had tried to do that, and now with Malta's help (and with much more help from the United States, after the Pearl Harbor attack in the war officially and beginning to gear up to full war production), the British would be able to reinforce and resupply until they possessed overwhelming superiority. By late October, when Montgomery was ready to attack, he would have 220,000 soldiers to oppose 90,000. He would have 1100 tanks to oppose 200 German and 300 (largely useless) Italian tanks. And perhaps a greater indication of British superiority was the fact that of the medium tanks with powerful 75-millimeter guns, the Germans would have only 30 Mark IV's, while Montgomery would have 210 Grants and 270 Shermans (the most effective tank in the desert at this point). The British would also have 1,000 artillery pieces and 100 105-millimeter self-propelled guns.

With Montgomery possessing such an array of weapon superiority, one commentator has stated that the noteworthy thing was not that he won the Second Battle of Alamein — but that he almost managed to lose it. And in addition to the weapon superiority, there was the fact that Operation Torch, the British and American invasion of West North Africa, was due to start in November — and almost surely would have compelled Rommel to retire to the Tunisia area, regardless of who won or lost in Egypt.

The battle opened October 23rd. As in the plans Auchinleck had made, the assault was made not around the desert flank, but in

the left center of the German forces. Montgomery's disposition of forces, however, had again separated the infantry and the armor into different corps, ignoring Auchinleck's plans to integrate infantry, armor, and artillery as the Germans had been so successful in doing. Yet, though under different command, the infantry and armor were so crowded into a narrow front that, when the infantry were hung up before penetrating the defenses, and lanes were not properly cleared for the supporting tanks, the German artillery had sitting duck armored targets all during the 24th. The objectives which were to have been reached in less than 12 hours took over ten days of hard fighting and heavy casualties to obtain.

After failing in his main direction (and losing 200 tanks in the attempt), Montgomery shifted his attack toward the coast. Rommel, who had been away sick, had flown back and led a counterattack which could make no headway against air power and the new six-pounder anti-tank gun. Finally Montgomery went back to his original point of attack with more troops, and after tremendous tank losses at last made it through the German central defense system on November 2nd. Rommel counterattacked so successfully that he was able to extricate his other troops in an orderly retreat. Then Hitler on November 3rd aided the Allied cause by ordering Rommel not to retreat. Rommel obeyed, the hard-won time gained for a proper retreat ticking away. Finally, on the evening of November 4th, after two days of a fight in a hopeless position, Hitler sent orders allowing Rommel to act as he felt necessary. Now, a day and a half too late, the retreat could begin. Montgomery, apart from his serious losses in men, had lost 600 tanks in the operation. Rommel had lost 180.

The battle was over; now was the time for a quick pursuit and a real, less costly victory. But so badly had Montgomery used up his men that the pursuit was very late in starting and moved very slowly. Montgomery's "trap" planned for just east of Mersa Matruh on November 6th caught nothing. Rommel's troops were making a model retreat.

And so it dragged on — Montgomery pursuing cautiously, despite the fact that Rommel, during much of the way, was down to ten tanks. Past the battlefields fought over so recently at Tobruk, Sidi Rezegh, Gazala, they went, with Montgomery never risking one of the old desert charges. He seemed to want not even the possibility of a war of maneuver. That kind of war, so recently fought, was now a war of the past. Subordinate commanders were kept under careful control. It was clear that Monty, for all his assumed dash, was always dominated by the fear that Rommel might do to him what he had done to others in the past. There was to be no chance for generalship to conquer here. This would be a war of "tidy" operations with limited objectives won by tremendous material superiority.

They came to the Jebel Achdar. Subordinates asked for a chance to take a solid

force by the old O'Connor route to Msus and create another Beda Fromm. Nothing but a very light force was allowed, while the main army plodded around the bulge and stopped at Benghazi. Rommel held them as long as he wished and then got out, destroying all the facilities which might be useful to the British. Then it was El Agheila again. Here Rommel bluffed for three weeks while Montgomery planned an elaborate set-piece battle. On December 13th he attacked — only to find Rommel had already gone.

Rommel could not have stayed if he had wanted. With the landings in French North Africa he was forced to join up with the German force being landed in Tunisia. Still Montgomery acted as if at any moment the

Desert Fox might turn on him with a new army to replay one of the old desert battles.

There was to be no miracle. No longer would brazen knights charge with pennants flying across the desert. The tidy war had displaced the old clash of titans riding their armored steeds across the blazing sands. On January 23rd Tripoli, its facilities wrecked, fell — appropriately with no final clash of armor, no glorious moment of truth when all had to be risked on a single decision. The Germans pulled out on their own schedule; the British moved in.

On February 12th, 1943, the "desert war" under Rommel had ended. Just two years before, he had landed in Tripoli. Now his troops were pulling across the border of

Tunisia. The troops and supplies which might have given the Desert Fox the victory had been denied him so long. Now they were being sent into Tunisia in senseless abundance — in time to be captured with the fall of Tunisia in the spring.

O'Connor was in a prison camp. Auchinleck was without a command. Rommel would be dead by a forced "suicide" in little more than a year. There would be left the victor, cockily strutting before the newsreel cameras, and many years later, his voice as brightly persistent as a scolding blue jay's, explaining his triumphs on the desert to an awed television audience.

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## REINFORCEMENTS CHART

DATE	INITIATIVE	GE AIR	BR AIR	GE SUPPLY	GE REPL	IT REPL	BR REPL
1941 MAR	GERMAN	3	0	7000	80	250	600
1 MAY	BRITISH	0	3	7000	80	250	600
1941 JULY	BRITISH	3	3	6000	80	175	350
1941 SEPT	BRITISH	3	3	6000	80	175	350
1941 NOV	BRITISH	3	3	6000	80	175	350
1942 JAN	GERMAN	0	3	10000	375	400	350
1942 MAR	GERMAN	3	3	10000	750	800	350
1942 MAY	GERMAN	9	3	10000	750	800	350
1942 JULY	GERMAN	3	9	10000	375	400	350
1942 SEPT	GERMAN	3	6	6000	80	175	350
1942 NOV	BRITISH	3	6	6000	80	175	1600
1943 JAN	BRITISH	3	3	6000	80	175	350

## TERRAIN EFFECTS CHART

TERRAIN	NMOBILE MP COST	MOBILE MP COST	DEFENSE	MAX FORT	NMOBILE/MOBILE SUPPLY COST
CLEAR	3	3	1.0	LEVEL 9	9/9
ROUGH	4	8	2.0	LEVEL 5	12/24
FORTRESS	1	1	2.5	LEVEL 3	3/3
TOWN	1	1	2.0	LEVEL 5	3/3
MOUNTAIN	6	12	2.5	LEVEL 3	18/36
COAST	1	1	1.5	LEVEL 8	3/3
LAND/IMPASSABLE	N/A	N/A	N/A	N/A	N/A

NOTE: For each fortification level a defending unit adds 20% to its combat strength. The terrain defense modifier and the fort modifier can not exceed 3. Therefore, a unit in rough terrain can utilize fort levels 1-5.

## COMBAT SUPPLY CHART

BATTLE INTENSITY	ATTACKER				DEFENDER			
	NONMOBILE		MOBILE		NONMOBILE		MOBILE	
	AXIS	ALLIED	AXIS	ALLIED	AXIS	ALLIED	AXIS	ALLIED
1	38	49	45	59	19	19	23	23
2	50	65	60	78	25	25	30	30
3	63	82	75	98	32	32	38	38
4	75	98	90	117	38	38	45	45
5	88	114	105	137	44	44	53	53
6	100	130	120	157	50	50	60	60
7	113	147	135	176	57	57	68	68
8	125	163	150	195	63	63	75	75
9	138	179	165	215	69	69	83	83

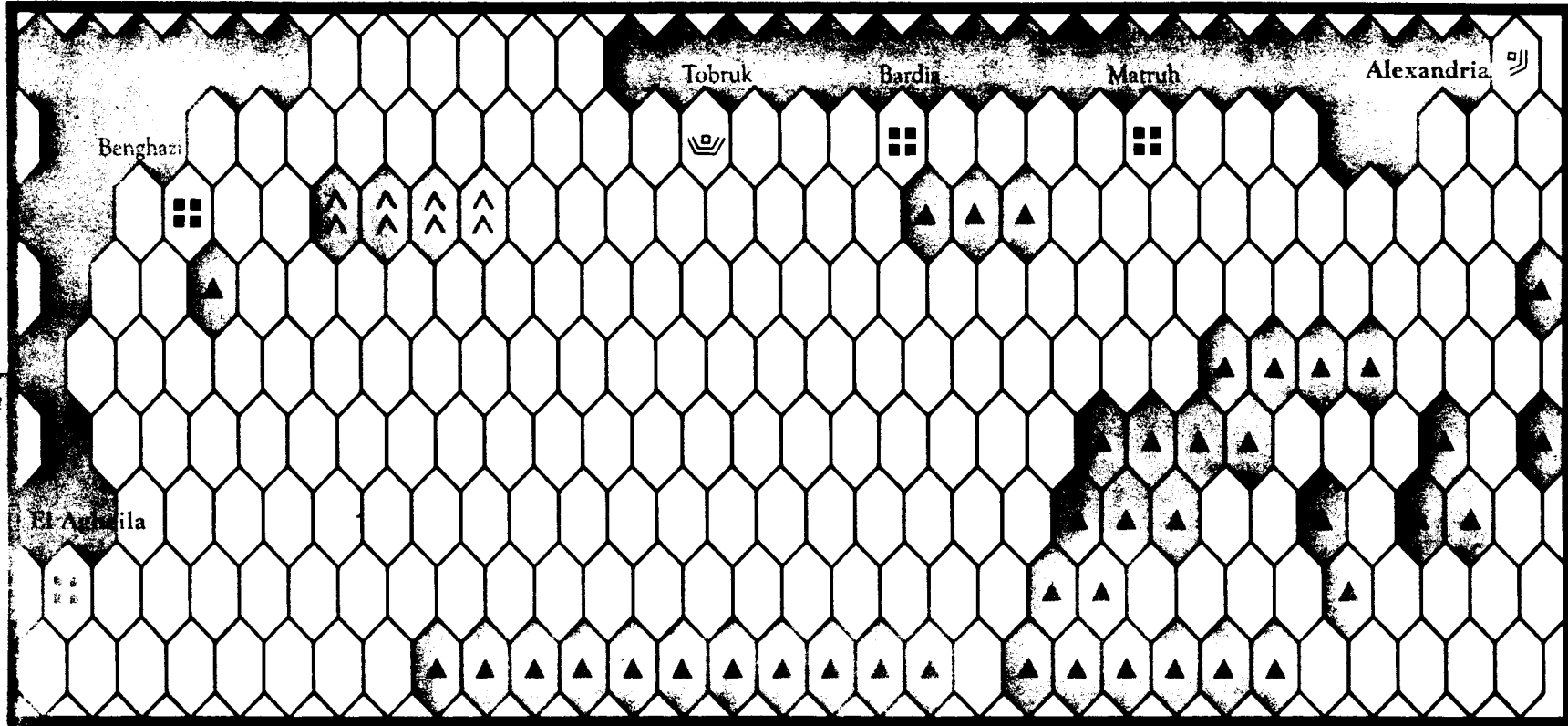
EXAMPLE: 21 PZ DIV attacks 4th IND INF DIV. Battle Intensity is 5.  
 21 PZ DIV is AXIS MOBILE unit- 105 Supply points expended.  
 IND INF DIV is ALLIED NONMOBILE unit- 44 Supply points expended.

NOTE: Supply costs for the computer-allied is the same as for the Axis.

If you have any questions or problems regarding the program or game, please send a self-addressed, stamped envelope with your question to Strategic Simulations, Inc., 883 Stierlin Road, Building A-200, Mountain Views, CA 94043-1983; or call (415) 964-1200 Mon., Tues., Thurs., or Fri.; 1-5 PM (P.S.T.)

# ATARI MAP DISPLAY

North



South

## UNIT SYMBOLS

## MAP LEGEND

Axis		Allied					
	Axis Stacking Symbol		German Infantry		Allied Stacking Symbol		Allied Infantry
	German Armor		Italian Infantry		Allied Armor		Allied Depot
	Italian Armor		Axis Depot		Clear		Fortress
					Coast		Fortress
					Ocean		Rough
					Town		Impassible Sand Dunes
							British Home Base
							German Home Base
							Mountain