Introduction

The Operational Art of War (TOAW), Volume II is a combined simulation and scenario editor covering military campaigns over the 1956-2000 period (1). Our goal is to model these campaigns as games, with a serious effort to represent some of the real problems faced by commanders in the field. Many things that are represented abstractly in other games are treated here in a relatively concrete way. Your forces are not just a collection of icons on a map, differing primarily in graphic representation or a shallow set of numerical strengths. While you can play this game at that level, your armies are actually very complex organizations of individual vehicles, weapons, or squads.

The troops who man your weapons may range from elite veterans to green conscript recruits who can improve their performance with experience. They need food and fuel and ammunition, and they get tired if you push them too hard. They will not usually fight to the last drop of binary blood, and they generally do not perform to their best potential if they have to coordinate with unfamiliar forces. If you ask them to do something complicated, they might not do it in quite the way you expect. In short, they act just a little bit like real troops.

The title "Operational Art of War" is based on a Soviet era military term meaning, essentially, "the theory and practice of army level combat". There isn't really a hard definition of "operational level" scale. The term is generally used to describe anything in the gray area between strategy (overall conduct of a war, including non-combat factors such as industrial production) and tactics (the details of the actions of small units). If your primary focus is the battlefield, it isn't strategy. If you can't smell the smoke, you aren't really dealing with tactics. I think of the operational level as "a view of the battlefield on a scale just exceeding that at which differing ranges of various direct fire weapons are significant".

The Operational Art is flexible enough to represent units ranging in size and organizational complexity from single vehicle to an entire orps. Map and time scales are flexible, with maps ranging from 2.5km to 50km per map location (arranged in an invisible hexagonal grid) and game turns ranging from six hours to 2 weeks. Air, land and sea action are modeled, but the emphasis is on land campaigns so air and naval forces are not treated quite as concretely as land forces.

Different game situations are called scenarios, and they can be created using the scenario editor. In Windows terms a scenario is essentially just a complex document, and the scenario editor a document processor. Individual scenarios can cover anything from short operations to complete campaigns, including significant events occurring outside the scenario theater. The editor includes a large equipment database, full map drawing capability, and programmed opponent operational planning. It is the same tool used to create the scenarios included with the game. If you feel the urge to do a bit of historical research, the scenarios you create can be as rich and interesting as ours are. In fact, our experience suggests that amateur designers will eventually create many of the best scenarios for the game.

1: The 1939-1955 time period is covered by 1998's award winning The Operational Art of War (TOAW), Volume I.

Starting the Game

The first control screen you see after the introduction has five buttons: Play New Game, Resume Saved Game, Resume PBEM Game, Set Game Options, and Edit Scenario.

Play New Game

Clicking on the Play New Game button brings up the New Game Dialog. From here you can choose from among the scenarios available to play. Click on one of the scenario buttons to the left of the dialog to view the briefing for that scenario. The play mode button allows you to select two player (sometimes called hotseat) play, Play by Email, or which side the computer opponent should play. When you have set the play mode and selected your scenario, click on the Play button to begin the scenario.

Resume Saved Game

Clicking on the Resume Saved Game button brings up a standard Windows file load dialog. You man change which type of game you wish to load by using the ‘‘Files of Type’’ field at the bottom of the dialog. Select your saved game and click ‘‘Open’’ to play.

Resume PBEM Game

Clicking on the Resume PBEM Game button brings up a standard Windows file load dialog. You man change which type of game you wish to load by using the ‘‘Files of Type’’ field at the bottom of the dialog. Select your saved game and click ‘‘Open’’ to play.

Set Game Options

Clicking on the Set Game Options button brings up a dialog used to set the most common game options. You may select either "standard rules" or "advanced rules". See Rules and Programmed Opponent Options for a detailed description of the options and their effects.

Edit Scenario

Clicking on the Edit Scenario button will send you to the Scenario Map Editor.

Rules and Programmed Opponent Options

Standard Rules

Sections described in this guide as Advanced Rules will not apply to your game. Under standard rules

- All right mouse button popup game menus are eliminated. Movement is always by single units and combat assignment is always by group. Embarking and disembarking of units is done using the small brass buttons in the unit panel.
- The unit report dialog is unavailable under standard rules. Unit orders and loss tolerance settings are inaccessible. Graphics representing loss tolerance, orders, and unit health are not shown on 2d unit icons.
- All environmental effects (weather and time of day) are treated as daytime / temperate temperatures / fair weather under standard rules.
- Target density and traffic density rules are "off" under standard rules. Map graphics associated with these rules effects are not displayed.
- All units are considered fully supplied under standard rules.
- All locations are considered "seen" under standard rules.
- All friendly units are fully "cooperative" under standard rules.
- All air unit missions are assigned by the computer. You can override computer assigned missions by using your air units to bombard enemy targets if you wish. (Scenario designers - missions are assigned at the end of the turn, so the missions you assign in the editor will be the missions for the first turn.)
- Bridge blowing and repair and bridge attacks are not available under standard rules. Automatic rail damage when units enter enemy territory will not occur.
- Unit division occurs only as a result of combat.
- Theater options are not available. (Scenario designers should keep this in mind and assign secondary activations for theater option events if they are necessary for the scenario.)
- Certain menu options are meaningless, and are "grayed out".

Advanced Rules

All rules described in this guide are in effect unless you turn them off in the advance game option dialog. If you turn any options off, they will simplify the game by removing the affected rules. Among other things, you can set the programmed opponent intelligence level and handicap (a strength cheat), and whether or not to play with limited intelligence on enemy deployments. Some of these options can also be set using the View / Game Options menu within the game or editor.

Rules Effects Options

- Command and Control: If you turn the command and control rules off, your formations and units will never "reorganize". They will always be available for move and attack orders.
- Scenario Variability: If you turn scenario variability off, scenarios will always end exactly on the historical ending turn. Any events with a 50% or greater possibility will always occur, and any events with less than 50% probability will never occur.
- Fog of War: If you turn fog of war off, you will always have full information on the locations of all enemy units.
- Environment: If you turn environmental effects off, weather and time of day have no effect. Mud and snow will have no effects.
- Detailed Combat Reports: If you turn detailed combat reports off, the details of a battle normally displayed after each combat will not appear. "Disaster" notifications will not appear if detailed combat reporting is "off". This option can toggled off or on during play via the "Play" pop-up menu.
- Active Disengagement: If you turn active disengagement off, all units will be able to disengage from enemy units (see Disengagement) automatically. There will be no disengagement attacks.

Programmed Opponent Options

- Intelligence: This sets the level of optimization in the programmed opponent code. In most cases, the programmed opponent will search larger areas, make multiple passes at problem solutions, and optimize the order in which it does things more heavily at higher levels. This results in more intelligent play at some cost in execution time.
- Handicap/Cheat: This sets the level of advantage for the human or programmed opponent in human vs. computer games. There is no advantage if "none" is selected. Selecting Human +1 or Human +2 gives increasing advantages (supplies, rest, strength modifiers, etc.) to a human player. Selecting Computer +1 or Computer +2 gives the same increasing advantages to the programmed opponent.

Switching Between Standard and Advanced Rules

You can switch between standard and advanced rules during play, but due to differences in the way certain things are calculated, supply and command settings will take a turn to stabilize after you change settings. The game itself should be stable, but things like supply and fog of war will remain set as they were during the last pre-turn calculation.

General Usage

Using the mouse

For the most part, the interface conforms to Windows 95 guidelines for windowed applications. Menus, file dialogs, and window controls work as you would expect. Left mouse clicks are used to make selections. Right mouse clicks are used to issue orders or call context menus.

The primary departure from Windows 95 guidelines is in scrolling of lists or documents. In most cases a left click on a scroll control button will scroll the list by one item while a right mouse button click will scroll the list by an entire displayed page. This can be used to quickly scroll through large lists.

Using the keyboard

The game supports a number of hotkeys.

- Message box style dialogs (those without ‘‘checkmark’’ style exit buttons) accept input from the number keys (either on the keypad or the main row at the top of the keyboard) to select from available options. The options buttons in these dialogs are always arranged vertically. The ‘‘1’’ key selects the top button. ‘‘2’’ selects the next button, etc.
- The ‘‘Escape’’ and ‘‘Enter’’ keys can be used to exit any standard game dialog with a ‘‘checkmark’’ style exit button. The will also exit from the small ‘‘message box’’ style dialogs if there is only one possible choice.
- F1 brings up the help file.
- The numerical keypad number keys can be used to scroll the map or center on the current unit.

  1 – Southwest

  2 – South

  3 – Southeast

  4 – West

  5 – Center on current unit

  6 – East

  7 – Northwest

  8 – North

  9 – Northeast
- The ‘‘arrow’’ keys can be used to scroll the microview map.
- A – Bring up the air unit report.
- C or F2– Group Composition: The group in the map location currently under the mouse cursor is displayed in a small dialog similar to one of the location panes in the attack planning dialog. If the cursor is not over an occupied location, the group in the current unit’s location will be displayed. This can be used to examine friendly or enemy occupied locations. If you click on a friendly unit in the dialog, it becomes the new current unit. The group composition dialog is also available in the map panel right mouse button popup menu as "Show Group Composition".
- E – Resolve all combats or end turn.
- F – Bring up the formation report. (Advanced Rules)
- G – Get the next unit stacked with the current unit, bring it to the top of the group stack, and make it the current unit.
- I – Toggle unit icons visible or invisible.
- M – Toggle standard unit icon display mode between movement and strengths.
- O – Bring up the Order of Battle report. (game only)
- P – If the current unit has attack orders, bring up the attack planning dialog. (Advanced Rules)
- U – Bring up the unit report. (Advanced Rules)
- W – Toggle the map pane weather view on or off. (Advanced Rules)
- Z – Undo

- Force Editor Hotkeys
- Addition: You can copy a unit's equipment into a buffer ("g" [get] key in force editor) and use it to replace the equipment in another unit ("a" [assign] key in force editor).

- -Select previous unit.
- + Select next unit.

The game window is limited to a minimum size of 640x480. On systems with limited memory, game windows may be limited to a maximum size of 800x600 or 1024x768. On systems with more than 32MB of RAM, there is no limit to the size of the game window.

A Very Important Note About the Interface

The effects of right or left mouse clicks are usually different, and are always described in the information panel at the bottom of the screen or dialog. There are no double click commands in the game. When you first start the game you may find it helpful to slowly pass the mouse cursor over the entire game window while keeping an eye on the information panel. As you play, keep an eye on the information panel for prompts and information.

The Window Frame

The Window Frame is a standard Windows 95 style window frame and menu. It can be sized, moved, maximized, minimized, etc.

The Map Panel

This area displays a portion of the current scenario map. Clicking within this panel to issue orders or make selections from the map. Move your mouse cursor to the edge of the map panel to scroll the display to other areas of the map.

The Information Panel

This area is shown along the bottom of the display. Prompts, help and general text feedback appear here. Be sure to look here for prompts and information as you move your mouse cursor around and click on within the game display.

The Microview Panel

If visible, this area in the lower right corner of the game display shows most or all of the current map using very small scale graphics. In some scenarios the map is large enough that it won't fit entirely within the microview panel. To scroll the microview map to another area of a large scenario map, move your mouse cursor to the edge of the microview panel.

The Control Panel

This area is shown along the right hand side of the game display. The appearance and functions of the control panel vary depending on whether you are playing the game or using the editor.

The Unit Panel

This area is visible in both the game and the Deployment Editor. Left clicking on the Unit Panel centers the screen on the unit. Right clicking on the panel brings up the Unit Report Dialog for the unit shown in the panel.

The Unit Panel shows the unit's name, parent formation, deployment or mission, and owning force. A graphic of the most significant equipment type assigned to the unit is superimposed on a background showing the terrain in the unit's location.

Various icons and numbers along the left side of the Unit Panel indicate the general state of the unit and the presence of other units also present in its location. From top to bottom: The health icon shows a color from green (very good unit supply, readiness and equipment levels) to red (very poor supply, readiness and equipment levels). Numbers to the right of the attack strength icon indicate the unit's attack strength. If the unit can fire long distances at enemy units the range is shown next to the attack number, otherwise the units anti-personnel and anti-armor strengths are shown. A number next to the defense strength icon indicates the unit's defense strength. Finally, two numbers next to the movement allowance icon indicate the unit's current and original movement allowances.

Several icons can appear along the right side of the Unit Panel to show that the unit can board or debark from ships, planes or trains. These icons also act as buttons. Clicking on them will order the unit to attempt the indicated action.

A "stack" of unit icons appears in the middle of the Unit Panel. If you move your mouse cursor along the stack, you can examine each unit grouped in the same location. Click on any one of the stacked unit icons to make the indicated unit the new "current unit".

The Map Edge

The map edge includes all locations adjacent to either an ‘‘off map’’ or ‘‘non playable’’ location.

The Theater

This is everything contained in the entire playable map area. You have complete control in the theater. In some scenarios, events can occur outside of the theater. These events can have significant impacts in the theater, and their potential effects may strongly influence your in-theater decisions.

Non Playable Areas

Some maps are partially obscured by black areas. These areas are permanently non playable. Units using air and airmobile movement may move through non playable areas, but they may not stop there. No other unit may enter a non playable area. Air strikes may be launched across non playable areas. Supply cannot be traced across non playable areas.

Exclusion Zones

In some scenarios, part of the map may be partially obscured by an overlay of diagonal lines. These are exclusion zones, and their effect is similar to that of non playable areas. There may be as many as two exclusion zones in any given scenario. For example, in the Middle East 1973 scenario there is one exclusion zone covering Lebanon and another covering the Kingdom of Jordan.

Friendly units within an exclusion zone may be examined. You can issue most kinds of orders to them and they are considered normally supplied. No unit may enter any location in an exclusion zone, although air strikes may be launched into excluded locations. Supply may not be traced through exclusion zones. Units in exclusion zones will not interfere with the movement of enemy units outside the zone, and will not "patrol" outside of the exclusion zone. Units outside of exclusion zones will not patrol locations inside of exclusion zones. Guerrilla activity has no effect within an exclusion zone.

Unlike non playable areas, exclusion zones may be removed during the course of a scenario.

What is a Unit?

A unit is the smallest organization of military force that can appear on a map. It is defined by the equipment assigned and authorized, its proficiency, readiness, supply, icon colors, icon type, and size symbol.

Unit Strengths and Capabilities

A unit's strengths and capabilities are based on the equipment assigned, proficiency, readiness, and supply level. Various assigned equipment strengths are scaled and combined into generic attack and defense numbers for quick reference purposes. The quick reference numbers are a reasonably good indicator of a unit's expected performance, but they only tell part of the story.

If you examine a unit report you will see the strengths broken down by category:

- Anti-Armor – This is the unit's strength against enemy armored equipment. Anti-Armor strength is only used against enemy armored equipment.
- Anti-Personnel – This is the unit's strength against enemy non-armored equipment. A small portion (5%) of this strength is also used against enemy armored equipment.
- Airmobile Transport – This is the unit's ability to provide airmobile transport to airmobile units within 200km.
- Anti-Air (high) – This is the unit's strength against aircraft operating at high altitude. This generally applies to medium and heavy bombers or aircraft performing interdiction missions in the area.
- Anti-Air (low) – This is the unit's strength against aircraft operating at low altitude. This generally applies to smaller aircraft performing bombardment or combat support missions, or launching interdiction attacks against moving units.
- Defense – This is the unit's general ability to defend itself.
- Reconnaissance – This is the unit's chance to perform exceptional feats of reconnaissance. It also influences a unit's strength at the beginning of an attack and its ability to move near enemy forces.
- Engineering – This is the unit's chance to rebuild bridges and aid other units in certain combat engineering tasks.
- Fording – This is the unit's ability to reduce movement penalties for itself or others entering river or canal terrain in the unit's location.
- Major Fording – This is the unit's ability to allow other units to enter "super river" or "Suez Canal" terrain.
- Rail Repair – This is the unit's chance to rebuild damaged rail lines.
- Artillery – This is the unit's bombardment strength. It includes that portion of the anti-personnel strength that the unit can use in bombardment missions or in combat support. Typically only headquarters, naval, air, and artillery units will have a non-zero artillery strength regardless of equipment assigned.

These strengths are simply the sums of the total strengths in each category for all equipment assigned to the unit, multiplied by the unit's Morale, scaled to fit the game displays. The unit's actual internal strengths, used for all game calculations but not displayed, are much larger numbers. At the low end (displayed unit strengths less than 3) there can be quite a bit of real difference between units that show similar displayed strengths.

Some units have anti aircraft fire ranges up to 50 km against air units participating in combat support or bombardments in the area.

Unit Experience and Proficiency

The proficiency of a veteran unit (one that has previously participated in a combat) is a known quantity. This is not true of untried units (those with no combat experience). A unit's actual proficiency is determined when it first participates in combat, and can vary by as much as 33% (relative to original strength) from the originally projected proficiency.

If a veteran unit receives large quantities of replacement equipment, there is a chance that the unit will lose its veteran status.

Every time a unit engages in combat there is a chance that its proficiency will increase. Less proficient units will increase more rapidly than more proficient units.

Unit Readiness

This represents the effects of wear and tear on equipment and troop fatigue. A fully rested unit has a readiness of 100%, and a completely exhausted unit has a readiness of 30%.

Unit Morale

This is a weighted average of a unit's proficiency, supply level, and readiness. Regardless of actual proficiency, supply level or readiness, Morale can be no lower than 10% and no higher than 100%. This value is multiplied by the raw equipment strengths to calculate the actual effective strengths of the unit.

Unit Quality

This is a weighted average of a unit's proficiency and readiness, expressed as a percentage. Regardless of actual proficiency and readiness, quality can be no lower than 10% and no higher than 100%. This is the chance that the unit will pass a quality check. Quality checks are made at numerous points in the game to determine things like the unit's ability to sustain an attack or hold ground in the face of a strong enemy attack.

Air Unit Combat Support and Air Superiority Reactions (Advanced Rules)

In order to provide combat support or intercept enemy air units, air units must pass both a quality check and a range check. The chance of passing a range check decreases with range to target as a proportion of the unit's combat range.

Unit Weight

This is the sum of weights of all assigned equipment, expressed in tons. This figure is used when determining whether the unit is eligible for transport by aircraft, helicopters, ships, or trains.

Unit Deployment Orders (Advanced Rules)

Units may be deployed in various ways within their location. This deployment status reflects an internal optimization for specific roles or missions:

- Defending – The unit is deployed to defend the location. There are defensive and supply advantages for this deployment.
- Entrenched – This is an enhanced version of the "defending" deployment, with greater defensive advantages.
- Fortified – This is the strongest possible defensive deployment, with very great defensive advantages.
- Tactical Reserve – The unit will attempt to react to enemy attacks into adjacent locations.
- Local Reserve – The unit will attempt to react to enemy attacks into locations within a movement radius defined by the unit's remaining movement allowance.
- Mobile – The unit is ready for movement. There are no particular advantages to this deployment, although artillery units will not provide long range supporting fire. This is the deployment status of a unit that moved in the previous turn.
- Moving – This is the same as a mobile deployment, except that the unit has already moved this turn. Units automatically deploy to moving status if they move.
- Attack – The unit is scheduled to launch an attack later in the turn. A unit enters the attacking deployment as soon as it is ordered to attack an enemy location.
- Limited Attack – The unit is scheduled to launch a limited attack later in the turn. A unit enters the limited attack deployment as soon as it is ordered to conduct a limited attack on an enemy location.
- Retreated – This is similar to a mobile deployment, except that the unit has recently retreated.
- Routed – This is similar to a mobile deployment, except that the unit has recently routed. The unit may not move or attack.
- Reorganizing – The unit is attempting to recover from recent combat, and may not move or attack.
- Embarked – The unit is boarded on strategic transports: railroad, ships, or aircraft. When the unit disembarks, it will automatically redeploy to moving status.
- Interdiction Mission – Air and helicopter units only. The unit will perform interdiction missions.
- Air Superiority Mission – Air units only. The unit will perform air superiority missions.
- Combat Support Mission – Air and helicopter units only. The unit will support friendly ground units during attacks.
- Rest Mission – Air and helicopter units only. The unit will perform no missions. This accelerates the units ability to recover readiness.

There are restrictions on your ability to change a unit's deployment status.

- A unit may only change to the defending deployment from tactical reserve, local reserve, or mobile deployments.
- A unit may only change to the entrenched deployment from the defending deployment. The unit must either pass a quality check or a local engineering check. Regardless of whether the entrenchment succeeds, the unit expends its entire movement allowance in the effort.
- A unit may only change to the fortified deployment from the defending deployment. The unit must either pass a quality check or a local engineering check. Regardless of whether the entrenchment succeeds, the unit expends its entire movement allowance in the effort.
- A unit may deploy to mobile, tactical reserve or local reserve deployments from defending, entrenched, tactical reserve, local reserve, or mobile deployments.

Unit Loss Tolerance Orders (Advanced Rules)

Unit combat actions depend on the unit's orders emphasis, a relative gauge of casualty tolerance.

- Ignore Losses: Units will attempt to either seize or defend locations in combat regardless of losses. This occasionally useful setting is very dangerous, and should generally be avoided.
- Limit Losses: Units will take losses into consideration in combat. They will either break off attacks or retreat from a defense if necessary for self-preservation. Most of your units should have this setting most of the time.
- Minimize Losses: Units will make only the most superficial efforts in combat. If the enemy is very weak, they will press their attack or defense. If the enemy is strong enough to inflict an significant losses, the unit will break off or retreat.

Division into Sub Units (Advanced Rules)

Units may divide and recombine. This is done using the divide / recombine button in the unit report dialog, or from the popup menu you get by right clicking on the unit icon in the map panel. When you choose to divide a unit, it can be divided into two or three sub units at your discretion. In order to recombine into the original unit, all sub units must be present. If any sub unit is lost, the unit may not recombine until the sub unit reappears as a reinforcement.

Sub units will have only about 80% of the parent unit's proficiency. If you recombine your units, the newly recombined parent unit will have 110% of the average sub unit's proficiency. This means that the simple act of dividing a unit and recombining it will result in the permanent loss of about 12% of the unit's proficiency (80% x 110% = 88%)

Air, naval and headquarters units may not be divided.

Formations with a large number of divided units are more likely to be forced into reorganization as a result of combat losses.

Unit Special Capabilities

Many units have special capabilities, based either on the equipment assigned or the unit icon symbol.

- Artillery and headquarters units automatically support cooperative friendly units within their bombardment range. They are also better at disengaging from the enemy than most other units.
- Ski units have enhanced movement capability in snowy locations.
- Bicycle units have enhanced movement capability along roads.
- Headquarters units aid in distribution of supplies to nearby cooperative units. In some scenarios they also provide command functions
- Units with various types of engineering equipment assigned can have an engineering capability. Such units may be able to rebuild destroyed bridges, aid in fortification efforts or fording operations (land units crossing rivers).
- Airborne Units: These units are eligible for air transport and airdrops.
- Airmobile Units: These units are eligible for airmobile transport.
- Special Forces: These units have large reconnaissance capabilities and a special capability to easily move near enemy units. They also have all of the capabilities of airborne, airmobile, and mountain units.
- Amphibious Units: These units are capable of independent amphibious movement.
- Naval Units: These units are only capable of movement through anchorage or deep water locations.
- Air Units: These units may only be based on airfields. Movement is a transfer from one airfield to another, while combat is normally handled as bombardment or combat support and does not actually require movement.
- Naval Air Units: These are air units with the additional capability to be based on aircraft carriers.
- Guerrilla Units: These units have special movement and attack capabilities.
- Helicopter Transport Units: These units can provide airmobile transport capacity for airmobile units within 200 km.
- Attack Helicopter Units: These units act much like air units, except that they may be based in any friendly location.

Equipment

This is the generic term for all of the useful weapons, transports and other hardware that can be assigned to units. The equipment in the game is rated for weapon range and anti-armor, anti-personal, anti-air high, anti-air low, and defense strengths. Each piece can also have one or more of the following characteristics:

Equipment Characteristics and Their Effects

Movement Related Characteristics

A unit's movement allowance and cost to enter certain terrain types is based on the movement characteristics of the equipment assigned to the unit.

- Riverine Equipment: The equipment uses the riverine movement rate (2400 km per week), and can only move along rivers and through shallow water and flooded marsh terrain.
- Motor Equipment: The equipment uses the motorized movement rate (560 km per week).
- Slow Motor Equipment: The equipment uses the slow motorized movement rate (350 km per week).
- Fast Motor Equipment: The equipment uses the fast motorized movement rate (660 km per week).
- Horse Equipment: The equipment uses the horse (wagons and transport) movement rate (340 km per week).
- Fast Horse Equipment: The equipment uses the fast horse (cavalry) movement rate (400 km per week). .
- Rail Move Equipment: The equipment always moves by rail movement (4200 km per week). It does this without using rail transport capacity, and can only move by rail.
- Slow Equipment: The equipment uses the foot movement rate (280 km per week).
- Static Equipment: The equipment requires transport in order to move.
- Agile: The equipment has a horsepower to weight ratio greater than 20 horsepower per ton. This equipment is quite capable of moving off roads and is slightly more difficult to hit on the battlefield.
- Roadbound: The equipment moves poorly off roads.
- Amphibious Equipment: The equipment has an intrinsic amphibious movement capability.

Combat Related Characteristics

Targeting

- Targeting+: The equipment has enhanced targeting capabilities. See Appendix for details.
- Targeting++: The equipment has enhanced targeting capabilities. See Appendix for details.
- Targeting+++: The equipment has enhanced targeting capabilities. See Appendix for details.
- Targeting++++: The equipment has enhanced targeting capabilities. See Appendix for details.
- All Weather Equipment: The equipment has a night / all weather capability. This is primarily used by aircraft.
- High AA Equipment: The equipment has an anti aircraft capability designed primarily for use against high altitude aircraft.
- Long Range Equipment: The equipment has a ranged fire capability.
- Extended Bombardment Range: The equipment can fire to 1.5 x its normal bombardment range, at half strength.

Exotic Armor

These types of armor provide improved resistance to HEAT anti-armor weapons.

- Composite Armor: The equipment has composite armor.
- Laminate Armor: The equipment has laminate armor. Chobham armor is an example.
- Reactive Armor: The equipment has reactive armor.

Defensive Capabilities

- Armor Equipment: The equipment is armored.
- Active Defender Equipment: The equipment actively contributes to a location's defense, and is directly exposed to enemy action during any combat.
- NBC (Nuclear, Biological, and Chemical) Equipment: The equipment is resistant to nuclear and chemical attacks.

Anti-Armor

- Kinetic Weapons: The equipment is considered to be using kinetic weapons in anti-armor combat.
- HEAT Weapons: The equipment is considered to be using some variation of High Explosive Anti Tank (HEAT) weapons in anti-armor combat. HEAT weapons have relatively poor performance against some kinds of armor.

Special Weapons

- Anti-Shipping Equipment: The equipment has a strong anti-shipping capability.
- Precision Guided Weapons: The equipment's attack strengths increase if the owning force has precision guided weapons. Systems that always use precision guided weapons do not have this characteristic.
- Smoke: The equipment fires only smoke.
- Nuclear Armed Equipment: The equipment can make nuclear attacks if nuclear weapons are available.

Transport Related Characteristics

- Transport Equipment: The equipment can transport other equipment.
- Light Transport Helicopter: The equipment can provide 1 ton of airmobile lift.
- Medium Transport Helicopter: The equipment can provide 3 tons of airmobile lift.
- Heavy Transport Helicopter: The equipment can provide 8 tons of airmobile lift.

- Lightweight: The equipment does not add to the weight of a unit.
- Airborne: The equipment can be transported by air.

Aircraft

- Naval Air Equipment: The equipment is a naval aircraft.
- High Air Equipment: The equipment is a high altitude aircraft.
- Low Air Equipment: The equipment is an aircraft that attacks at low altitude.

Ships

- Heavy Naval Equipment: The equipment is a heavy naval vessel.
- Medium Naval Equipment: The equipment is a medium naval vessel.
- Light Naval Equipment: The equipment is a light naval vessel.
- Carrier Naval Equipment: The equipment can base naval aircraft units.

Engineering

- Engineer Equipment: The equipment has an engineering capability.
- Major Fording Equipment: The equipment can enter super river or Suez Canal locations and can assist other units in entering this terrain.
- Rail Repair Equipment: The equipment can repair damaged rails.

Special Capabilities

- Recon Equipment: The equipment has a reconnaissance capability.
- Support: The equipment provides supply functions for a formation.
- Command: The equipment provided command functions for a formation.
- Police: The equipment reduces traffic congestion penalties in its location.
- Most unit strengths and capabilities are based on the total strengths and capabilities of all equipment assigned to the unit.

Authorized Equipment

A military unit is essentially an organization of troops and equipment. Real world military units usually have an ‘‘official’’ table of organization and equipment (TO&E). This is the equipment that the unit is authorized to control. In most cases, real units do not exactly match their authorized strength. If the assigned strength is less than the authorized strength, the unit is considered ‘‘understrength’’, and will be eligible for replacements.

Assigned Equipment

The equipment actually under the control of a unit at any given time is considered ‘‘assigned’’. Generally, but not always, the amount of equipment assigned to a unit is less than the amount authorized. The strengths and capabilities of a unit are largely determined by the equipment actually assigned.

Force

A force is a complete list of all units and formations assigned to one player side in a scenario. It also includes a number of characteristics that affect just about everything you do with units of that force. These characteristics are transparent. They show up in your unit strengths, etc., but you don't need to know about them. Scenario designers set them to achieve specific historical effects.

Force Characteristics and Their Effects

These values reflect various force wide capabilities. Some are only directly visible in the editor but all have strong effects on your force's ability fight.

Force Supply Stockpile

(0-100%) – This represents supply stockpiles available to the entire force.

Force Proficiency

(0-100%) – This represents the overall proficiency of the force. This characteristic is used to determine the length of your turn. Reconstituted unit proficiencies are averaged with this value.

Force air refueling range multiplier

This value can range from one to ten. Aircraft with in-flight refueling capability will have their ranges multiplied by this amount. Any extended ranges are shown in the game, but the characteristic itself is only visible in the editor.

Force NBC proficiency

Losses to chemical and nuclear attacks are reduced if this value is greater than zero. At the maximum level of 100%, losses for all equipment are reduced as though they had an inherent NBC defense capability (see equipment). This characteristic is only directly visible in the editor.

Force Night combat proficiency

Unit proficiencies are averaged with this value when determining anti-armor, anti-personnel, and defense strengths at night. This characteristic is only visible in the editor.

Force Electronic support level

This represents the general electronic capability of the force: radar, electronic counter measures, signal intelligence, etc. This characteristic is only visible in the editor.

Communication checks

The chance for a unit to pass a communication check increases if the friendly electronic support level is higher than the enemy electronic support level, and decreases if the friendly electronic support level is lower than the enemy electronic support level. Unless the enemy force has a much higher electronic support level, a unit usually passes a communication check. Units that have not moved this turn have a higher chance of passing a communication check.

Electronic support checks

An electronic support check passes if a random number from zero to the friendly force electronic support level is higher than a random number from zero to the enemy force electronic support level.

Electronic Support Effects

- Locations with HQ units, air units, and units that move or fire, are "noticed" at the beginning of the following turn if the enemy player makes an electronic support check for the location.
- Combats involving large numbers of units are affected by relative electronic support levels. Artillery, HQ and air units can only support combats if they pass a communication check. Attacks with a large fraction of units failing communication checks will take longer to resolve.
- Individual units and entire formations may be unavailable for orders (reorganizing) at the beginning of a turn due to enemy electronic warfare. Individual units may be unavailable if they fail communication checks, and formations are more likely to be unavailable if a significant proportion of attached units fail communication checks.
- Long range anti aircraft units must pass an electronic support check to fire on aircraft at ranges of 1 hex or more.

Force guided weapons level

(0-100%) - Systems with precision guided weapons capabilities (set in the equipment list - mostly aircraft) have their anti-air, anti-armor, and bombardment strengths multiplied by (100% + force guided weapons level%). If you set this value to the maximum value of 100%, these systems will have their strengths multiplied by 2.0. This characteristic is visible only in the editor.

Formation

A formation is an organization of units with a common headquarters. Units belonging to the same formation are shown on the map by a silver hilight.

Formation Support Scope

Formation Support Scope Effects (Advanced Rules)

There are limits on the cooperation possible between units in your force. In most cases your units will only work well with others belonging to the same formation, but there are special cases where some cooperation with units of other formations is possible:

Formation Support Scope Levels

- Internal Support: Units assigned to the formation may only freely cooperate with others in the same formation. Limited cooperation is possible with units using the same icon color scheme. No cooperation is possible with units using a different icon color scheme.
- Army Support: Units assigned to the formation may only freely cooperate with others in the same formation, or those using the same icon color scheme (icon and symbol color). Limited cooperation is possible with units using the same icon background color. No cooperation is possible with units using a different basic icon color.
- Force Support: Units assigned to the formation may only freely cooperate with others in the same formation, or others using the same basic icon color. Limited cooperation is capable with all other units.
- Free Support: Units assigned to the formation may freely cooperate with any other units.

Unit Cooperation

- Free cooperation: Units will coordinate attacks and defenses. Reserve and combat support units will attempt to respond to all attacks in range. Nearby headquarters units will increase the likelihood of re-supply. This is shown with a gold flag icon in the combat planning dialog.
- Limited cooperation: Units will coordinate attacks and defenses, but with penalties. Reserve units will respond to all attacks in range. Combat support units will not respond to attacks. This is shown with a silver flag icon in the combat planning dialog.
- No cooperation: Units will not coordinate attacks. Defense is coordinated, but with penalties. Reserve and combat support units will not respond to attacks. This is shown with a black flag icon in the combat planning dialog.

Cooperative Units

Any units capable of free cooperation are considered cooperative. All other units are considered non-cooperative. Non cooperative support units will not automatically support attacks or defenses. Movement penalties may apply when moving units through locations occupied by non-cooperative units. Supply may be more difficult in locations containing non-cooperative units. Proximity of cooperative headquarters units can make it easier for units to receive supplies.

The Current Unit

At any given time, the information for one unit is displayed in the Unit Panel. This is the current unit. Any unit related changes (new icon, equipment assignments, etc.) apply only to this unit.

The Current Force

At any given time, only one force (of the two possible) is displayed. Any selections you make will affect only this force.

The Current Formation

At any given time, only one formation can be displayed. Any changes you make will affect only this formation.

Order of Battle

This is a complete list of all units and formations comprising both forces in a scenario.

Local Force Limits ("Grouping")

Up to nine units of all types may occupy any particular location. In most cases, it is best to limit the number of units in a location to a smaller number. The precise limit depends upon the equipment assigned to the units involved, but a good rule of thumb limit for efficient use of your forces is three land or naval units, and three air units.

Orders Scope (Advanced Rules)

When you give orders to your forces, the effects can apply to either a single unit, a group of units in a single location, or all units that can possibly participate in a given action.

- Single Unit Orders Scope: Your orders apply only the current unit.
- Single Group Orders Scope: Your orders apply to all units occupying the current unit's location.
- All Units Orders Scope: Your orders apply to all units that can participate in a particular action – typically an attack on an enemy position.

Play by Email

The Operational Art of War has a built in Play by Email (PBEM) capability. If you choose to play by email, the game will automatically prompt you to create PBEM game files for your opponent at the appropriate times. These files are similar to saved game files, but they include some additional information and have a "PBM" file extension. Send the PBEM file to your opponent when your turn is finished. You may continue your turn using the PBEM file he sends back in response.

When you begin the game you will be asked for a password. You will need this password to continue the game from the PBEM file returned by your opponent. Keep your password secret from your opponent to prevent him from viewing information that should not be available to him. You will be given an opportunity to view a playback of your opponent's turn when you load a PBEM game.

There are certain restrictions on PBEM games. Variable Initiative is locked out, so the order of play will never change during a scenario. You will need your opponent's password if you decide to end the scenario early, so it is only possible to end a scenario if both players agree. Finally, while the undo function is functional during PBEM games it does leave a record in the playback. If you undo an action in a PBEM game you should be prepared to explain your reasons to your opponent.

Victory

Victory in the game is based on control of objectives and penalties for combat losses. If you control more objective points while taking fewer losses than your opponent, you win. Otherwise, you lose. To some extent, losses offset objective values. It is entirely possible that your losses can completely negate any advantage for holding a particular chunk of real estate. Values for objectives controlled and penalties for losses taken are tracked in the victory pane of the Situation Briefing. This briefing pops up at the beginning of every turn. Keep an eye on it.

What Happens During a Game Turn

Each game is divided into a number of turns, and things happen in a specific order during each turn. First the game performs a bit of automatic bookkeeping, then you and your opponent issue your orders and the program determines results. When both players' orders have been resolved the turn ends.

Automatic Bookkeeping

- An End of Scenario check is made and the calendar is adjusted.
- Out of Theater events occur.
- Weather is determined.
- Theater Air Superiority and Interdiction strengths are determined.
- Intelligence is gathered.
- Units and security forces conduct local patrols.
- Your forces are re-supplied, receive replacements, and prepared for the new turn.
- Reinforcements appear and units are withdrawn.
- Unit Command and Control levels are set.

End of Scenario Check

There are two ways for a scenario to end automatically (at the discretion of the program):

- A scenario will end when it reaches its nominal final turn. This nominal final turn can change during a scenario, so keep an eye on it to avoid surprises.
- A scenario will end if there are no units of one force on the map.

Out of Theater Events

Some scenarios are heavily influenced by out of theater events. These events may be triggered by your actions in the theater. The most significant potential events should be detailed in the scenario description. Military decisions can have political consequences. If an opportunity in the game looks too good to be true, check the scenario description to make sure you won't bring the sky crashing down by taking advantage of it.

The variety of potential events is too great to be fully described here. If you are curious about the kinds of things scenario designers might throw at you, check out The Event Engine.

Climate and Weather (Advanced Rules)

Weather is determined on a location by location basis, from turn to turn. Mountains are cooler. Locations adjacent to shallow or deep water are moderated. Cold and warm weather fronts may move across the theater. Rain or snow may result in some locations becoming ‘‘snowy’’ or ‘‘muddy’’, with significant effects on movement.

While any location with sub freezing temperatures is labeled as ‘‘very cold’’, there are actually three different levels of sub freezing temperatures. The average temperature of any weather zone is listed in the Weather Briefing. Water features (rivers, canals, shallow water, etc.) in very cold locations may or may not be frozen. Rivers and canals freeze at the ‘‘frozen 2’’ level. ‘‘Super’’ rivers and shallow water freeze at the ‘‘frozen 3’’ level.

Weather Effects on Bicycle and Ski Units

Bicycle and ski unit icons are displayed only if local conditions are appropriate. Ski units are displayed as infantry when in non-snowy locations. Bicycle units are displayed using infantry icons when in any "very cold" location.

Weather Effects on Chemical Weapons

Chemicals are most lethal in cool or moderate temperatures, no precipitation, and overcast conditions. They are least effective in hot temperatures and heavy rain or bright sunlight. High temperatures, wind, and sunlight degrade chemical agents. Rain washes it away and impedes efficient distribution. Chemicals can increase readiness losses in combat for both sides. They are most tiring (3x) at higher temperatures, and have little readiness effect at low temperatures. (Actually, it's not the chemicals. It's the damned protective suits that do the damage. You have to wear one of these things to believe how uncomfortable they are.)

Weather Effects on Nuclear Weapons

Nukes are most lethal in hot temperatures, no precipitation, and fair conditions. They are least effective in cold temperatures, heavy rain, and overcast conditions. This is due to a combination of exposure and atmospheric transparency.

Air Superiority and Interdiction

All of your air units perform missions based on their deployment status. See Unit Deployment .

Air Superiority

Units assigned air superiority missions attempt to destroy enemy aircraft flying missions and to protect friendly aircraft and locations. They will engage your opponent's air units only if they attempt to fly missions. All missions performed by air units are affected by the local air superiority strengths of each force.

Local Air Superiority

Air units with air superiority missions may or may not participate in any particular local air superiority combat. The chance that a unit will participate is based on the range to the unit's base, its force electronic support level, and the unit's quality. High quality units and those nearby are more likely to participate than lower quality units further from the location. A force's Local Air Superiority strength is the sum of anti-air strengths of all participating friendly air units with air superiority missions.

Spontaneous Furballs

Even if no other missions are flown, opposing units with air superiority missions may fight at the beginning of each turn when the program sparks a number of air superiority battles at random locations on the map.

Theater Air Superiority

The program keeps track of air superiority units and calculates a theater air superiority level for each force. Theater air superiority is a general indicator of air superiority in the theater. It is presented solely for your information, and isn't used by the program.

Interdiction

Units assigned interdiction missions will attempt to intercept enemy ground units during movement and impair your opponent's ability to supply his force. Units performing interdiction missions are subject to interception by enemy air units with air superiority missions, and are protected by friendly units with air superiority missions.

Interdiction is less effective in poor weather and on PM turns.

Intelligence Gathering (Advanced Rules)

You will never have complete information on the location of enemy forces during a game. The amount of information you do have is based on the type and location of your reconnaissance assets, and local environmental conditions.

Levels of Information

Your knowledge of any particular map location may be:

- Unknown – You have no information regarding the presence of enemy units.
- Observed – You know whether or not enemy units are present, but their identity and strengths are not evaluated.
- Spotted – You know of any enemy units that are present, as well as their identity and strengths.

Reconnaissance Assets

- Units – All of your units have the ability to detect, and in some cases evaluate the strengths of enemy units in nearby locations.
- Internal Security – All of the terrain you own is considered either observed or spotted. Areas near dense urban locations are more likely to be spotted.
- Theater Reconnaissance – This represents everything from spies on the ground to reconnaissance aircraft. The quality of theater reconnaissance depends heavily on environmental conditions. Theater reconnaissance is capable of observing locations, but can not spot them.

Intelligence Updates

Intelligence information is updated at the beginning of every turn. Each of your units gathers information on nearby locations. Then your internal security forces gather information your rear areas and your theater reconnaissance assets gather information on enemy held areas.

Generally, units and internal security assets can only observe adjacent locations. If, however, the unit or internal security asset is observing from a location with a mountain peak, observation visibility can be as far as 40 kilometers. This mountain view advantage deteriorates with decreasing visibility and during PM turns. Likewise, if an adjacent location is viewed through an escarpment, the location is more likely to be spotted by units ‘‘looking down’’ and less likely to be spotted by units ‘‘looking up’’.

Theater reconnaissance is more likely to observe locations with roads, ports, airfields, or large concentrations of motorized equipment. Airfields with air units will almost certainly be observed. Theater reconnaissance is less likely to observe locations with hills, badlands, mountains, dense urban, light woods, jungle, or forest terrain, as well as locations with hazy or (especially) overcast visibility conditions. Theater reconnaissance is also less effective during PM turns.

Previously ‘‘spotted’’ locations will remain spotted as long as they remain under observation by any of your reconnaissance assets. Previously ‘‘observed’’ locations may become ‘‘spotted’’ if they remain under observation. Locations no longer under observation become ‘‘unknown’’.

The level of intelligence information available for any particular location is displayed with the location description in the Information panel.

Local Patrols and Guerrilla Effects

When a unit occupies a location, that location becomes "owned" by the unit's force. Unoccupied locations tend to remain owned by the last force to occupy them. There are, however, times when a location can change ownership without being occupied by a unit.

- Guerillas can cause a location's ownership to change. Guerillas operate more effectively in hills, badlands, mountains, light woods, jungle, and forest locations. Guerillas operate less effectively in anchorage or road locations, and will not operate in airfield or urban locations. Guerillas are only present if the scenario calls for them.
- Locations adjacent to a dense urban location or a unit of only one force become owned by the force owning the urban location or unit.

Scenario designers should keep these effects in mind when setting objective victory values.

Supply (Advanced Rules)

Supply is a critical factor in The Operational Art. Individual units need supplies to operate effectively. As units move and fight they expend their internal supply stockpiles. In order to maintain your units' effectiveness, the expended supplied must be replaced. Replacement supplies flow through lines of communication from the force stockpile, through formations, to individual units.

Lines of Communication

A line of communication is a path from one location to another. Lines of communication are blocked by enemy units, locations adjacent to enemies and not occupied by friendly units, non-road badlands terrain, non-road dunes terrain or terrain that can not be entered by a normal land unit.

Unit Supply

Each unit has its own supply level, a percentage value reflecting the unit's own internal supply stockpile (beans, bullets, gasoline, etc.). These supplies are actually in the hands of the troops, available for immediate use. A unit's supply level strongly affects its capabilities.

Each unit expends supplies as it acts to follow your orders. When necessary, units draw new supplies from their force supply stockpile, through their formation supply system. Units may begin a scenario with a level greater than 150%, but supply levels may not be increased above 150% during the course of a scenario. Any oversupplied unit (supply level greater than 100%) will lose its excess supplies if it moves. (For this purpose, participation in combat is not considered movement.)

Unit readiness for unsupplied units is limited to no more than the unit's supply level or the minimum readiness (33%), whichever is higher.

Unsupplied units with very low supply and readiness levels are subject to desertion effects. Deserting troops and equipment are lost permanently. They are not placed in the replacement pool. The number of deserters increases as supply and readiness levels decrease, and decreases with higher unit proficiencies. Desertions tend to start slowly (particularly in high proficiency units) and accelerate over time.

Formation Supply Distribution Efficiency

Each formation has a supply distribution efficiency, a percentage value reflecting the formation's ability to distribute supplies from the force stockpile to units in the formation. This value is set for each formation in a scenario, and actually means different things for different types of formations. It takes into account everything from dedicated organic transport capability to the mindset of the troops responsible for getting the goodies to the troops.

Force Supply Stockpile

Each force has a supply stockpile level. This level generally remains constant, but can be vary in some scenarios. It represents supplies available for distribution to units, through formation supply systems.

Transport Asset Sharing

Units that do not move and are not assigned a local or tactical reserve mobility status will temporarily lend a portion of their transport assets (equipment with a transport capability, such as trucks, horse teams, etc.) to their parent formation, (and possibly to others depending upon the formation support level) to aid in distributing supply to other units. Any unused rail, air, or sea transport capacity also contributes to re-supply efforts. This results in a boost to the formation's capacity to distribute supplies. Transport asset sharing has no negative effects.

Interdiction Effects

Enemy air units flying interdiction missions impair supply distribution. This is determined on a location by location basis (local interdiction), but the average value over the entire theater (theater interdiction) is calculated for your planning use. The theater interdiction level is not used by the program.

HQ Bias Effects

The level of re-supply possible for a unit increases by 50% if a cooperative headquarters unit is located with or adjacent to a unit.

If a headquarters unit assigned to a formation is destroyed, or if any assigned support squads have been eliminated, the formation's supply distribution efficiency is reduced. You should protect your headquarters units to avoid disruptions to unit re-supply.

Supply Lines

In order to receive normal re-supply, units must be able to trace a line of communication back to a friendly supply source. If the unit can not trace this supply line, its supply level will drop by an amount equal to the number of half days in a turn.

Supply is first traced through friendly controlled road, improved road, undamaged railroad, urban, airfield, and anchorage locations. Any location with an unbroken line of communication through these types of terrain to a friendly supply point is fully supplied - providing the maximum possible amount of resupply for units. This is called the fully supplied net.

Supply is then traced from the fully supplied net through friendly cropland, open, or arid locations. Any location with an unbroken line of communication through these types of terrain to a friendly supply point is normally supplied - providing 75% of the maximum possible amount of resupply for units.

Locations not fully or normally supplied, but able to trace a line of communication no more than a scenario dependent number of hexes long to any normally or fully supplied location are considered to have limited supply. Units in these locations receive 50% of the maximum possible resupply.

Locations not otherwise supplied, but able to trace a line of communication of any length to any friendly supply point are considered to have minimal supply. Units in these locations receive 25% of the maximum possible resupply.

Unit readiness for unsupplied units is limited to no more than the unit's supply level or the minimum readiness (33%), whichever is higher.

Unsupplied units with very low supply and readiness levels are subject to desertion effects. Deserting troops and equipment are lost permanently. They are not placed in the replacement pool. The number of deserters increases as supply and readiness levels decrease, and decreases with higher unit proficiencies. Desertions tend to start slowly (particularly in high proficiency units) and accelerate over time.

Local Terrain Effects

Some terrain types influence re-supply levels. Units occupying marsh, flooded marsh, and mountain terrain receive 2/3 of the supply they would otherwise receive.

Airborne Re-supply

If a unit can not trace a line of communication back to a friendly supply source, it may still be able to receive re-supply. The level of re-supply available to any particular is based on the amount of air transport capacity left unused at the end of the previous turn and the total size of the units requiring airborne re-supply. Local airborne re-supply levels are reduced by 33% if visibility in the location is hazy, or 50% if the visibility in the location is overcast.

Night Re-Supply

Re-supply levels are reduced by 33% during P.M. turns.

Other Considerations

If a unit moved (from one location to another) in the previous turn re-supply level is reduced by 33%.

Supply on the First Turn of a Scenario

Units do not draw re-supply on the first turn of a scenario.

Replacements

Equipment losses are a fact of life on the battlefield. If these losses are not replaced, your units will become less useful over time. Your units are eligible to automatically receive replacements from your force equipment stockpiles if they are understrength, in supply, and not embarked on ships or trains. In most scenarios, your force replacement stockpiles will be replenished on a regular basis. In some scenarios, units may have different priorities for receiving replacements. This will usually be mentioned in the scenario briefing.

If your force is at full strength, replacements will appear in the form of reconstituted previously destroyed units built up from replacement equipment. Reconstituted units are always ‘‘untried’’. When units are reconstituted there is a 1 to 4 week delay in their appearance. Reconstituted air units appear at airfields. Other reconstituted units will appear at a scenario specific point (which should be mentioned in the scenario briefing) or near friendly supply sources in urban or road locations. If no friendly supply sources are located in urban or road locations, or if the scenario specific reentry point is not friendly controlled, land units will not be reconstituted. Special forces, Coastal artillery, and fixed artillery units are never reconstituted. Reconstituted airborne and glider units will keep their special icons, but are no longer eligible for airborne movement. Reconstituted units are listed as such in the Expected Reinforcements briefing.

The code that decides where to bring reconstituted units back onto the map is quite intelligent. It will attempt to avoid bottlenecks in unit placements while placing units in "good" locations. Unless the scenario designer has placed a reconstitution point there, the chance of a unit appearing at a location isolated by water from the parent formation's first objective is now very low. Land units will reconstitute in "distant" locations only if the distant location is specified as the scenario reconstitution point.

Readiness Recovery (Advanced Rules)

Your units' readiness declines during movement and combat. Readiness can only be replenished by rest. Unit readiness recovers at the beginning every turn but the first. The amount recovered is based on the scenario time and distance scales, but will generally be approximately the amount needed to fully recover from a maximum movement. Units recover readiness more slowly if they have moved in the previous turn, occupy a contaminated location, or if they are unsupplied.

Due to the highly technical nature of air and helicopter units, these units readiness recovery is also strongly affected by unit proficiency. Low proficiency air and helicopter units will recover readiness very slowly.

Reinforcements and Withdrawals

From time to time, new units may appear on the map as reinforcements. They generally appear at a specific time and place, but there are differences in the restrictions between different types of units and different locations. Reinforcements may appear either on a specific turn, or, if the scenario calls for it, as the result of some occurrence. You can check your Expected Reinforcements report for predictions of when a given unit will arrive, but units may arrive either sooner or later than the predicted turn. Reinforcements always enter at or near the location listed in the report, if that location is available. Generally, a location is available if the unit could move into it normally. In some cases there are additional restrictions. You can check the Recent Reinforcements dialog for information on reinforcements received this turn.

Land Units

Most land units will always appear at the location given in the formation report, if that location is available. A location is only considered to be available if it is either friendly controlled or located on a map edge. If for some reason the location is not available, units scheduled to appear on a map edge will instead appear at some other available location along the same map edge, within 2 hexes. Units scheduled to appear away from a map edge will only enter when the location becomes friendly controlled.

Guerrilla Unit Reinforcements

Guerrilla units scheduled to appear as reinforcements may appear at any playable location within three hexes of their scheduled reinforcement location if that location is enemy occupied. Unlike other units, guerrilla units may appear in enemy owned locations, converting them to friendly ownership upon entry.

Naval Units

Naval units will appear in the nearest available deep water, map edge location.

Air Units

Air units will appear at the nearest available base appropriate to the units' equipment. Naval air units appear on available aircraft carriers or air bases. Other air units appear on air bases.

Withdrawals

In some scenarios, some units may be scheduled to withdraw. The game will automatically withdraw the unit in the most appropriate manner. Be sure to check your reinforcement report for withdrawals when playing a scenario, since it can be a rude surprise if your entire plan depends upon a unit scheduled to become unavailable to you. If a unit is withdrawn it will be listed in the Recent Reinforcements dialog on the turn of withdrawal.

Command and Control (Advanced Rules)

You can usually, but not always, issue movement or attack orders to any unit on the map. The exceptions are:

Unit Reorganization

Units failing multiple quality checks during combat, usually as the result of significant combat losses, can become so disorganized that they will no longer respond to your orders. When this happens, the unit is said to be "reorganizing". At the beginning of each turn, all reorganizing units are checked to see if they have finished their reorganization. Units must pass a modified quality check in order to complete reorganization. This is more likely if they are supplied, have not moved in the previous turn, and are located with or adjacent to a cooperative headquarters unit.

Formation Attack Restrictions

Units of formations failing a formation quality check at the beginning of a turn are considered to be reorganizing and will only be available for non-combat orders. They will accept all other orders, and they will defend normally, but are not available for launching attacks or bombardments.

Formation quality is the average of the formation's proficiency and average assigned unit quality. Formation quality is reduced if many units are divided. The formation passes the quality check if this value is greater than a random number from 1 to 100, or if the number of units that experienced severe combat results in the previous turn is smaller than a random number from 1 to the number of units in the formation. This means that formations are subject to reorganization on turns following heavy combat.

Formation proficiency is reduced by 50% if any assigned HQ unit is eliminated, or if all assigned command groups in the HQ have been eliminated. You should attempt to protect your headquarters units to avoid this drop in proficiency.

You Issue Orders to Your Forces

A new turn will start if the scenario doesn't end during the turn start bookkeeping checks. You and your opponent will both be given an opportunity to issue orders to your forces.

Variable Initiative

The force defined in the scenario as "the first player" (usually the attacking force) will always move first on the first turn of a scenario. After that the first player is determined by an initiative check. This means the order of players can change from turn to turn.

The initiative level of a force is partly randomized, but is strongly influenced by the average movement allowance of all friendly units on the map but not assigned to formations with a reserve status.

In PBEM games the initiative remains fixed in the order established on the first turn of the game.

Control Panel Buttons

Depending upon the size of your game window there may be up to five rows of buttons in the control panel, immediately below the Unit Panel. The functions of these buttons are described by prompts in the information panel at the bottom of the window. The most critical control panel buttons are grouped in the top two rows:

- Previous Unit – Focuses the game's attention on the previous unit in the force by making it the current unit.
- Next Unit – Focuses the game's attention on the next unit in the force by making it the current unit.
- Unit Icon Display – Changes the unit icon display preferences. In 2d mode, this selects between showing unit strengths or movement allowances.
- Undo – Undoes the previous order.
- Previous Formation – Focuses the game's attention on the previous formation, making its first unit the current unit.
- Next Formation – Focuses the game's attention on the next formation, making its first unit the current unit.
- Current Formation – Brings up the Current Formation Dialog, from which you can examine the entire formation and issue non-movement or combat orders to units belonging to the formation.
- Resolve Combats / End Turn – If you have any combats planned, this will resolve them. Depending upon the state of your forces after the combat your turn may end or continue. If no combats are planned, this simply ends your turn.

Selecting Theater Options (Advanced Rules)

In some scenarios you may have options to request out of theater actions that can affect the situation on the map. Use the View / Theater Options menu item to check your theater options. Click on an option button in the dialog to select an available option. Your selection will become effective at the end of the turn.

Giving Orders to Your Units

You order normal movement or combat by right clicking on a map location. Select units by left clicking on them.

Advanced Unit Orders Rules (Advanced Rules)

In most cases you will be able to choose how many units you wish to affect by an order. Depending on your orders, one or more units will attempt to attack or move toward the selected location by the most effective route. If you right click on your current unit, you can issue general orders to it from the unit orders popup menu.

General Unit Orders Popup Menus (Advanced Rules)

You can use this menu to issue general orders to your units. Most of these orders can also be issued from other dialogs, displays, etc. But this is the most convenient place to see exactly what options you have for your units at any given time.

- Disband Unit – Disband the unit, returning all of its equipment to the replacement pool.
- Divide Unit – Divide the unit into 2 to 4 smaller units.
- Recombine Unit – Recombine a number of smaller units into a single larger unit.
- Board Train – Board train to use rail movement.
- Board Aircraft – Board aircraft to use air movement or airborne movement.
- Board Helicopters – Board helicopters to use airmobile movement.
- Board Ship – Board ship to use seaborne movement/
- Disembark – Disembark for train, aircraft, helicopters, or ships.
- Repair Railroad – Attempt to repair damaged railroads.
- Destroy Bridges – Destroy bridges.
- Repair Bridges – Attempt to repair bridges.
- Deploy: Dig In – Assume or increase defensive deployment, either defending, entrenched, or fortified.
- Deploy: Tactical Reserve – Assume a tactical reserve order.
- Deploy: Local Reserve – Assume a local reserve order
- Deploy: Mobile – Assume a mobile deployment.
- Mission: Air Superiority – Air units only, assume an air superiority mission.
- Mission: Interdiction – Air and helicopter units only, assume an interdiction mission.
- Mission: Combat Support – Air and helicopter units only, assume a combat support mission.
- Mission: Rest – Air and helicopter units only, assume a rest mission.
- Orders: Minimize Losses – Set loss tolerance to minimize losses.
- Orders: Limit Losses – Set loss tolerance to limit losses.
- Orders: Ignore Losses – Set loss tolerance to ignore losses.
- Show Unit Report – Show the unit report dialog.
- Show Formation Report – Show the formation report dialog.
- Show Group Composition – Show the group composition dialog.

Movement to Distant Locations

In some scenarios, some locations may be ‘‘distant’’. These locations are usually used to represent off-map anchorages and airfields and are generally surrounded by non-playable or deep water locations. Any movement to or from a distant location adds a number of locations equal to the distance to the move. (This actually occurs very rarely, and then usually only for sea or airborne movement.) The distance of a distant location is included when determining attack ranges.

Land Movement

This is the normal movement of land units through certain allowed types of terrain.

Change of Ownership

When a non-guerrilla land unit enters an enemy controlled location, that location becomes friendly controlled.

Railroad Damage

Any railroads in an enemy-controlled location may be damaged when a friendly unit enters the location. The chance that this will happen is scenario dependent. Damaged (broken) railroads may not be used for railroad movement.

Transit Attrition

Even in the best of cases your units will suffer minor equipment losses during movement. Most of these losses represent simple straggling or small details left behind for route security duties and are not permanent. The ‘‘lost’’ equipment is assigned to your replacement pool for later redistribution.

Interdiction Strikes

If your opponent has any air units flying interdiction missions, it is possible that your unit may come under air attack during movement. The chance for this is proportional to your opponent's Local Interdiction Level. Units on roads or using rail movement are particularly vulnerable to interdiction strikes. Enemy air units striking your units might be intercepted by your Local Air Superiority effort which in turn are subject to attack by your opponent's Local Air Superiority.

Supply Consumption

Your units will consume part of their internal supplies and will suffer a reduced readiness with every movement point expended.

Disengagement (Advanced Rules)

In the real world it can be quite difficult to break contact with enemy units. When you order your units to move from a location adjacent to an enemy unit, your units will attempt to disengage. Successful disengagement results in normal ordered movement.

Disengagement is automatic if:

- Your unit is a commando unit.
- Your unit is either a headquarters or artillery unit, and the destination location is occupied by a friendly unit.
- Your unit is moving from a location adjacent to the enemy, to a destination not adjacent to enemies, and there is a friendly unit in the original location.

Your disengagement chance is improved if:

- Your unit has a large reconnaissance capability.
- Your unit began the turn with a very high movement allowance relative to the enemy units.
- Your unit is heavily equipped with armored equipment.
- Your unit is withdrawing from good defensive terrain.
- It is a PM turn.
- It is raining or there is heavy snow on the ground.
- Friendly long range artillery is nearby to support your unit.

Your disengagement chance is reduced if:

- The enemy units have a large reconnaissance capability.
- Your unit began the turn with a low movement allowance relative to the enemy units.
- Enemy long range artillery is nearby.

Terrain modifies the disengaging unit's reconnaissance capability:

- Badlands, forests, super rivers and Suez canal locations offer the best cover for disengagement (3xrecon).
- Bocage, dense urban, river, canal and fortified line locations (2.5xrecon).
- Mountains, urban (2xrecon).
- Cropland, hills (1.5xrecon).

Terrain modifications for disengagement reconnaissance strength are not cumulative. Only the "best" (highest value) terrain type is considered. For disengagement purposes, unit reconnaissance capabilities are multiplied by an additional 0.5 on PM turns or if there is heavy rain or snow in the location (cumulative).

Should your unit fail to disengage from the enemy it will be subject to a disengagement attack. This is a short, one sided shot at your unit as it attempts to move. The attack is based on the attack strengths of all enemy units involved, and the defense strength of your moving unit plus any supporting fire from eligible air and artillery units. Only the moving unit will take losses, which may force it to retreat, divide into sub units, or (in a worst case) disband.

If the units attempting to disengage are much weaker than adjacent enemy units there is an additional movement cost - up to 3x the normal cost to move out of the location. Relatively strong units will see no additional movement costs.

If you wish to avoid the effects of disengagement in your games, you can turn "active disengagement" off using the game options dialog

Attack Popup Menus and Attack Planning (Advanced Rules)

When you order your units to move into an enemy occupied location, you are actually creating a plan for an attack on that position at some later point in the turn. In rare cases the would-be defenders may decide to retreat rather than facing your attack (See Retreat Before Combat). If this happens, your units may advance into the vacant location. If the defender does not retreat before combat a popup menu will allow you to set up an attack. You can quickly select the number of units to attack and set their loss tolerance directly from the popup menu. If you wish to plan the battle in detail, you can choose the Attack Planning Dialog .

Attack Deployment (Advanced Rules)

You may set up as many attacks as you wish. The orders emphasis you select determines how hard your units will fight for their objectives. If more than one unit is scheduled to attack any particular location, all involved units are combined into a single attack. Units may be ordered to attack, conduct a limited attack, or (if at a distance) bombard the defender.

Attacking units participate fully, and may advance into the location if the enemy retreats. Units conducting a limited attack add half their strengths to the attack, suffer only half losses, and will not advance into the location after combat. Bombardment attacks may be set up against enemy units within range of your air and long range artillery units by clicking on any non adjacent enemy target location within range. Bombarding units will not advance after combat. Attacks take precedence over bombardments. If any attacks are plotted against a location scheduled to be bombarded, any bombarding units are added to the attack. Bombardments are generally much less effective than attacks, but they can be useful for damaging enemy units out of reach of a normal attack.

Retreat Before Combat

The first time you order a unit to attack any particular enemy location in any given turn, there is a chance that the defenders will retreat before combat. If there is a large difference between the combined attack strengths of your current unit when the attack is ordered and the combined defense strengths of the enemy units in the defending location, the defender will make a quality check for his units. If they fail the quality check they will immediately attempt to disengage from your units and retreat. In many cases this will result in the destruction of the defending units during your movement, leaving their location open for occupation by your units. Headquarters and Artillery units, and units with minimize losses orders are more likely to retreat before combat. A unit with “ignore losses” orders is less likely to retreat.

Attack Options (Advanced Rules)

If the defending force does not retreat before combat, you will be asked for your general attack orders. Depending on circumstances, you may be given the following options:

- Single Unit Attack – The current unit at the time of the order will attack the enemy position.
- Single Unit Limited Attack – The current unit at the time of the order will conduct a limited attack on the enemy position.
- Single Unit Bombardment – The current unit at the time of the order will bombard the enemy position.
- Single Group Attack – All units grouped with the current unit will attack the enemy position.
- Single Group Limited Attack – All units grouped with the current unit will conduct a limited attack on the enemy position.
- Single Group Bombardment – All bombardment capable units grouped with the current unit will bombard the enemy position.
- Nuclear Attack – The unit will launch a nuclear attack. The strength of the attack is shown on the menu.
- Bridge Attack – The unit will attack bridges in the location. The chance of success is shown on the menu.
- All Units Attack – All units that can possibly participate will attack the enemy position.
- All Units Limited Attack – All units that can possibly participate will conduct a limited attack on the enemy position.
- Minimize Losses – Do not press the attack in the face of determined enemy opposition.
- Limit Losses – Press the attack even in the face of significant casualties. This is the usual attack order emphasis.
- Ignore Losses – Press the attack regardless of casualties. You don't want to do this very often.

Reconnaissance (Advanced Rules)

As your units approach or enter enemy territory they will discover previously unknown enemy units in or adjacent to their path. Normally only the number and type of enemy units will be uncovered during movement. If your moving unit has a large reconnaissance capability, you may also discover enemy strength information. Units using air, airborne, or airmobile movement have a greatly reduced chance of gaining information on enemy units. These units can actually fly over enemy units without spotting them.

Naval Movement

This is the movement of naval units through deep water or anchorage locations.

Air Movement

This is the movement of air units from one air base to another. While air units may attack any enemy with their range, their movement destinations are strictly limited to friendly air bases.

Railroad Movement

This is the movement of land units by train, along rail lines. In order to use railroad movement, your unit must begin your turn in a railroad location and you must have sufficient rail transport capacity to lift the unit. A train icon in the Unit Panel shows eligibility for rail movement. Click on the icon to bring up the unit report and load the unit on trains.

Units may move very large distances by rail with no movement attrition or loss of supplies and readiness, however; they are very vulnerable to enemy attacks.

Seaborne Movement

This is the movement of land units through deep water or anchorage locations. In most cases, land units must be embarked on ships to move by sea. In order to use seaborne movement, your unit must begin your turn in a anchorage location and you must have sufficient sealift capacity to lift the unit. A ship icon in the Unit Panel shows eligibility for seaborne movement. Click on the icon to bring up the unit report and load the unit on ships.

In some scenarios, some units may have an independent amphibious capability and can always move using seaborne movement.

Airborne Movement

This is the movement of airborne capable land units while embarked on air transports. In order to use airborne movement, your unit must begin its turn in an airbase location and you must have sufficient airlift capacity to lift the unit. Units may only board aircraft if there is another unit present in the location, or if there are no enemy units in adjacent locations.An air transport icon in the Unit Panel shows eligibility for airborne movement. Click on the icon to load the unit on aircraft.

An airborne unit may disembark without ill effects on any friendly controlled airbase, or it may conduct an airdrop on any other location that it could normally enter or attack. You may not deliberately drop your unit on an enemy occupied location, and Headquarters units may drop only into friendly controlled territory. Typically though, the contents of the location will be unknown. If enemy units are discovered to be present at the time of the drop, your airdropped unit will be destroyed unless the enemy units opt to retreat before combat.

Some equipment is too heavy to be moved by transport aircraft during the time period covered by this game. All non airborne capable armored vehicles and transport in excess of the bare minimum required by the unit for normal land movement will be stripped from the unit and added to your replacement pool for later redistribution.

Headquarters units may airdrop only into friendly controlled territory.

Airborne units are subject to equipment losses and possible arbitrary division into sub units during airdrops, and may be scattered outside their intended destination location in smaller (5km, 10km) scale scenarios. Poor terrain (forests, jungle, badlands, mountains, urban, etc.) and environmental factors (bad weather, night) can have a strong negative affect on your unit during an airdrop.

If the enemy has air units with air superiority missions, your units may also suffer attrition from enemy interception. It is best to avoid airdrops in the face of significant enemy air opposition.

Airmobile Movement

This is the movement of helicopter and airmobile-capable land units while embarked on helicopters. In order to use airmobile movement, your unit must either be a helicopter unit itself or it must begin its turn with 200 km of helicopter transport units with enough combined airmobile transport capacity to lift the entire unit. It is not necessary to be in the same location as a helicopter transport unit. An airmobile transport icon in the Unit Panel shows eligibility for airmobile movement. Click on the icon to load the unit on helicopters. Any helicopter units providing airmobile transport for a unit have their movement allowances reduced to zero for the turn. A unit may not provide airmobile transport if it has moved.

Helicopter units may only move to friendly controlled locations. This restriction does not apply to airmobile units using airmobile movement, which can even enter and pass through enemy occupied locations.

Units using airmobile movement are subject to interception by enemy aircraft flying air superiority missions, and to anti-aircraft fire from enemy units that they fly over.

An airmobile unit may disembark without any ill effects in any playable location not occupied by enemy units. If it disembarks onto an enemy unit an airmobile assault is immediately conducted. Unlike airborne units, airmobile units are not subject to scattering or drop attrition when disembarking in enemy territory. Units using airmobile movement automatically disembark when they reach the end of their movement allowance, if you end your turn, or if you select another unit. Disembarked airmobile units have ½ their original movement allowance.

If an airmobile assault goes badly, or if for some other reason the unit has to end its movement without disembarking, the unit will be returned to its original location. Depending upon the reason for the failure, the unit may suffer substantial losses – particularly to heavier weapons. In some cases it may be possible to pick the unit up and immediately launch another airmobile movement and assault, but this is usually not a good idea.

Embarked Status

An “embarked” unit (regardless of transport mode; e.g., train, boat or plane) displays a embarked “stairstep” button icon in the Unit Panel. In most cases you can disembark by clicking in the embarked button, or from the general unit orders popup menu. Additionally, a special “embarked” 2D icon replaces the unit’s normal 2D unit symbol icon in the Unit Panel.

Once a unit has expended movement points using an embarked type of transport mode it is usually restricted in its ability to move by normal land movement on the turn that it disembarks.

Movement Costs and Allowances

In order for a unit to enter a location, it must have sufficient remaining movement allowance. If a unit has not moved previously in the turn, it can always move at least once into any allowed location regardless of cost. Unit movement allowances are based on the supply levels and equipment assigned, and the scenario physical and time scales.

Land Unit Movement Costs

Roads

Movement costs along roads vary from 1 to 3, depending upon the number of vehicles and horse teams already in the location. Mud increases movement costs along roads (not improved roads) by 1.

Off Roads

The minimum standard cost for a land unit to enter most allowed locations is based on the unit's movement category:

- Minimum Standard Cost (foot or mixed movement):1
- Minimum Standard Cost (motorized movement):2
- (Advanced Rules) Even the presence of friendly units in a location can increase the standard cost for entering that location. The exact amount of the cost increase is dependent on the number of vehicles and horse teams already there, and affects motorized units more strongly than other types. Units with military police can reduce these movement cost increases. If there are already nine units in the location, or if there are any enemy units there, the movement is not allowed. If there are fewer than nine friendly units in the location, the maximum standard cost for entry is based on the unit's movement category:
- (Advanced Rules) Maximum Standard Cost (foot or mixed movement): 3
- (Advanced Rules) Maximum Standard Cost (motorized movement): 6

Additional Land Movement Costs

Some terrain types prohibit movement or impose additional costs for entry.

- Alpine: not allowed except along road or improved road.
- Any forest: +2.
- Arid: No effect
- Badlands: Mixed or motorized movement not allowed, mountain units +2, all others x3
- Bocage/hedgerow: +2
- Broken railroad: No effect. May not be used for rail movement.
- Cropland: +1
- Dunes: Mixed or motorized movement not allowed, mountain units +2, all others x3.
- Across escarpment: mountain units +1, all others +2.
- Across major escarpment: mountain units +2, all others not allowed.
- Deep water: Not allowed, except along road or improved road.
- Dense Urban +1 (ruined same)
- Flooded marsh: Amphibious units +2, all others not allowed.
- Hills: Mountain units no effect, Motorized and Mixed movement +2, all others +1.
- Impassible Mountains: Not allowed.
- Jungle +3
- Light Woods +1
- Marsh +2
- Mountain: mountain units +1, all others +2.
- Mud: Foot movement +2 all others +3
- Non Playable: Not allowed.
- Railroad: No effect, unless using rail movement.
- Rocky: Foot movement +1, all others +2.
- Sand: +1
- Snow: Motorized Movement+3 ski no effect, all others +2
- Unfrozen River or Canal: Amphibious units no effect. All others +2 (usually – see River Movement Costs).
- Unfrozen Shallow Water: Not allowed.
- Unfrozen Super River or Suez Canal-Amphibious units cost is 2, all others not allowed.
- (Advanced Rules) Frozen River, Super River, Canal, or Shallow water: no effect.
- Urban: No effect
- Wadi: Mountain units no effect, Motorized and Mixed movement +2, all others +1.
- Enemy Controlled Terrain-Up to 10% of original movement allowance.-Depends on unit reconnaissance capability. This cost also applies throughout the entire turn in which a location first becomes friendly controlled.
- Enemy adjacent-12.5% to 25% of original movement allowance.-Depends on unit reconnaissance capability. Doubled if moving from one such location to another. Presence of a friendly unit negates the penalty.

Land units may move into frozen shallow water locations. Supply may be traced through frozen shallow water locations as if they were open terrain. If a unit is on a frozen shallow water or "super" river location when it thaws it will automatically move

to an adjacent location if possible. If there is no adjacent location to which the unit could be moved, it will instead evaporate - and all equipment assigned to the unit is lost. Note - this means you need to keep an eye on your weather report as spring approaches to avoid losing units deployed on frozen shallow water or frozen "super" river locations.

Contaminated terrain costs 1.5 x the usual amount.

River Movement Costs

Rivers and Canals (as opposed to super rivers or Suez Canal) normally add 2 to the cost of entering a location. There are exceptions:

- Amphibious units are exempt from river movement costs
- If the total fording capability in the location, including that of the moving unit is greater than 20%, the moving unit is exempt from river movement costs.
- If the total fording capability in the location, including that of the moving unit is greater than 10%, the river adds only one point to the movement cost. Total fording strengths less than 10% have no effect on river movement.

Naval Unit Movement Costs

Naval units, and land units using sea transport may enter any anchorage or deep water location at a cost of 1. No other locations are allowed.

Airborne Movement Costs

Units using air transport may enter any location at a cost of 1.

Railroad Movement Costs

Units using rail transport may enter any connected rail location at a cost of 1.

Airmobile Movement Costs

Units using airmobile transport may enter any location not occupied by enemy units at a cost of 1. Locations occupied by enemy units cost 3.

Bridge building / demolition (Advanced Rules)

Any unit can blow bridges. This can be done at any time and at no cost.

Only units with an engineering capability can build bridges. The unit must not have moved previously in the turn, and the attempt will consume the unit's entire movement allowance. The chance of success is equal to the unit's engineering capability.

Fording Support

All land units can cross canals and rivers at an additional movement cost. The presence of units with an engineering capability can reduce this cost. See River Movement Costs .

Major Fording Support

Land units can not usually enter super river or Suez Canal locations. Some units do have the ability to enter these locations and create temporary crossing points for other units. The cost to cross through one of these points varies from +1 to +3 depending upon the total major fording capacity in the hex.

Fortification (Advanced Rules)

All land units may deploy into defensive positions. The presence of units with an engineering capability increases the chance of successfully entrenching or fortifying. Even if a unit fails to entrench or fortify it will increase the local entrenchment level, making it easier for that unit and others to entrench or fortify in the future.

Units with defensive or entrenched deployments automatically dig in if they have any remaining movement allowance at the end of a turn. Note that this may occur after the enemy has had a chance to attack, so in many cases it is best to continue digging ‘‘manually’’ using the popup menu.

Once created, field fortifications are permanent. As the entrenchment level of a location increases, units in the location will find it easier to enter entrenched or fortified deployments. When a location changes hands, the entrenchment level is reduced by 25%.

Fortified line terrain is a special case. The entrenchment level of a fortified line location is always set to 100% at the start of a scenario.

Railroad Repair (Advanced Rules)

Units with a rail repair capability can repair broken railroads. The unit must not have moved previously in the turn, and the attempt will consume the unit's entire movement allowance. The chance of success is equal to the unit's rail repair capability. Units with a railroad repair capability will automatically attempt to repair damaged railroads in their location at the end of their turn.

Automatic Railroad Repair: In most scenarios, both forces have an automatic railroad repair capability. The default value is 1 location per turn, which is repaired when the program performs automatic bookkeeping. This is in addition to the railroad repair capability of any units on the map. The auto rail repair code is reasonably intelligent. It attempts to recreate destroyed supply nets from supply sources out to the edges of the map.

All Battles Are Resolved

Whenever you wish during your turn, you may request that attacks and bombardments planned during your movement be resolved. Click on the switch sides / combat resolution button to make the request. The battles are resolved before control of the game is returned either to you or your opponent.

The battle for each location is fought separately. All units scheduled to attack any given location are combined into a single attack, and all available support units on both sides add their fire to the battle. Support units may participate in more than one battle. This is particularly true of air units.

Attacks are resolved in order of complexity, with simpler attacks occurring before more complex attacks. (See Attack Complexity)

Individual battles are resolved in a series of tactical rounds. Each player turn is divided into ten tactical rounds, and individual battles begin on the round that most closely corresponds to the proportion of the attacking units' movement allowance expended before the combat. Example: A unit with a remaining movement allowance of 12 and an initial movement allowance of 18 begins its attack on round 3. These rounds are used only for combat purposes and have no direct affect on your game play.

On each tactical round combat is resolved in order of local bombardment, then anti-armor combat and anti-personnel combat. During local bombardment all supporting units fire their bombardment strengths at the enemy. Air units are subject to interception and anti-aircraft fire. Then enemy armored equipment is fired on by the combined friendly anti-armor strength and all enemy equipment is fired on by the combined friendly anti-personnel strength. Generally, only actively defending equipment is subject to losses during anti-armor and anti-personnel fire.

Much of the equipment "lost" during combat is not actually destroyed. Instead, it is considered damaged or temporarily unserviceable. This damaged equipment goes to the replacement pool unless the owning unit is out of supply. In the case of air and naval equipment, the fraction of damaged equipment going to the replacement pool is proportional to the owning unit's proficiency.

After each round all involved units check for break-off. The chance that a unit will break off depends on losses, orders emphasis, coordination difficulty, and the duration of the individual attack. Attacking units that break off simply cease their participation in the attack. Defending units that break off attempt to disengage and retreat. Unit supply and readiness levels are reduced in each round of combat. Readiness losses are increased if chemical weapons are in use. Air units involved in combat are subject to more quality checks than other units. Air units failing these additional quality checks attack with lower strengths.

After the break-off check, any defending reserve units that can respond will move toward or into the location of the attack. It is possible for these units to arrive as other defenders are retreating.

Battles continue until all units of one side have broken off, but not beyond tactical round 10. Individual attacks will tend to last longer and cause greater losses if both sides are evenly matched or have aggressive (ignore losses) orders emphasis.

Airfield Defense

Air units with a high altitude anti air capability will automatically join in local air superiority combat regardless of mission if their base is attacked by enemy air units. They will also rise to intercept airmobile and airborne units launching assaults on their base.

Air and Naval Units in Land Combat

Air and naval units can only participate in land combat in their role as long range artillery supporting attacks or defenses. They do not contribute to the defense of their own location when attacked by land units. If an air or naval unit is the only occupant of a location under attack by enemy land units it will immediately attempt to retreat (air units will relocate to a friendly air base). If no retreat is possible, the unit is immediately destroyed.

Nuclear Attacks

Nuclear attack strengths range from 0.01kT (kilotons of TNT) to 4mT (megatons of TNT), and their lethality is based on the physical scale of the scenario. Effects may not be limited to the target location. The estimated effective strength of the attack is shown on the popup menu. This weather dependent strength may vary from the what you would expect by examination of the unit's equipment. If a radius is given, the attack effect will extend outside of the target location. The attack strength drops off rapidly outside of the target, but can in some cases still be quite deadly even several hexes away. Unless you are really desperate, it is best to avoid launching nuclear attacks if friendly units are within the attack radius.

Armored equipment is much more resistant to nuclear attacks than non-armored equipment. You generally won't take out many tanks with a nuclear attack unless the cumulative attack total is several hundred kT or more.

After a nuclear attack, the target and nearby locations may become contaminated. The path of contamination outside the target is somewhat randomized, but can extend up to three times the attack radius from the actual attack location – generally to the east. Once contaminated, locations remain contaminated for the remainder of the scenario. Units in contaminated locations will suffer reductions in readiness every turn.

Bridge Attacks

Unlike all other kinds of attacks, bridge attacks can be ordered on locations with no known enemy units. Only enemy owned bridges may be attacked. The chance of success for a single unit launching a bridge attack is shown on the popup. If more than one unit participates all unit attack strengths are added and the bridge attack is conducted as a single bombardment (so the chances are cumulative).

Battlefield Reconnaissance

All unit strengths are increased by the unit's reconnaissance capability on the first round of combat. Reconnaissance capability has no effect on subsequent rounds. Example: If a unit has a anti-personnel strength of 15 and a reconnaissance capability of 30%, its effective anti-personnel strength on the first round of combat would be 19.

Target Density (Advanced Rules)

Normal combat loss calculations assume target densities below a certain value based on the physical scale of the scenario. In many cases you can exceed this target density by piling units into a location. This may be the only way to effectively concentrate for an attack in some scenarios, but there is a cost. If you present the other force with a concentration of equipment so dense that he can't help but hit something with every shot you may take excessive losses. Locations with excessive target densities are indicated on the map by a small colored light in the west corner of the location. These indicator lights range from yellow-green to red.

As a rule of thumb, you should avoid piling units into a location if you start seeing yellow, orange or red target density lights on the map.

- No indicator. Target density is at or below the limit for the scenario.
- A Yellow-green indicator is a caution. Target density limits have been exceeded, and combat losses are multiplied by 1.0 to 1.4.
- A Yellow indicator is a warning. Excessive target densities will result in combat losses being multiplied by 1.4 to 1.7.
- An orange indicator is a strong warning. Excessive target densities will result in combat losses being multiplied by 1.7 to 2.0.
- A red indicator is a very strong warning. Excessive target densities will result in a combat losses being multiplied by at least 2.0.

Supporting Long Range Fire

All cooperative air units with combat support orders, artillery and naval units may automatically add one-half of their bombardment strengths to each attack within range. Artillery units will not support combats if they have mobile deployments. Units must pass a communication check in order to provide combat support. Air units may fail to react if the range is long compared to their combat radius. There is no supporting fire for bombardments. Air units may suffer losses to anti-aircraft fire and interception by enemy units with air superiority missions.

Environmental Effects on Combat (Advanced Rules)

Terrain and environmental conditions have a strong effect on combat. Terrain primarily benefits defending land units and sometimes penalizes attacking land units. Visibility and time of day affect air unit strengths.

Observation (Advanced Rules)

Mountain peaks within observation range of the combat location increase effectiveness of long range fire.

Defensive Anti-Armor Strengths

Defending units benefit from increased anti-armor strengths in some terrain or deployments. Effects are not cumulative.

- Fortified line, dense urban or dense urban ruin x3
- Bocage, marsh, urban, or urban ruin x2
- Defending, entrenched, or fortified x1.5

Defensive Anti Personnel Strengths

Defending units benefit from increased anti-personnel strengths in some deployments.
Defending, entrenched or bocage x1.5.

Fortified units benefit from increased anti-personnel strengths x3.0.

Defensive Strengths of Vehicles

Vehicles in defending units benefit from increased defensive strengths in some terrain and deployments. Effects are not cumulative.

- Dense urban, dense urban ruin, or entrenched x1.5
- Fortified line or fortified deployment x2.0

Defensive Strengths of Infantry (Infantry, Infantry weapons)

Infantry and non static weapons in defending units benefit from increased defensive strengths in some terrain or deployments. Effects are not cumulative.

- Light woods, forest, hills, wadi, or defending x2.0
- Bocage, urban, urban ruin, jungle, dunes or entrenched x3.0
- Dense urban, dense urban ruin, badlands, fortified line or fortified deployment x4.0

Defensive Strengths of Static Equipment

Static equipment (equipment that requires transport in order to move) benefits from increased defensive strengths in some terrain or deployments. Effects are not cumulative.

- Bocage, light woods, forest, hills, urban, urban ruin, wadi or defending x1.5
- Dense urban, dense urban ruin, jungle, dunes or entrenched x2.0
- Badlands fortified line or fortified deployment x3.0

Attacking Unit Strengths

Land units attacking from river, super river, canal, Suez Canal, or deep water (amphibious assaults) have all strengths multiplied by x0.7.

Escarpments

Since only mountain units can move across major escarpments, they are the only units that can attack across them. Their losses will be 3x normal for the attack. Combat across minor escarpments results in 2x losses for the attacker. Artillery and headquarters are not so affected. Artillery attacks at 150% strength if it is "looking down" on the target across an escarpment.

Visibility (Advanced Rules)

Visibility affects air unit attack and defense strengths.

- Fair 100%
- Hazy 100% for all weather equipment, 66% otherwise
- Overcast 66% for all weather equipment, 33% otherwise

Night and Day (Advanced Rules)

In six hour and half day turn scenarios, time of day affects air unit attack and defense strengths.

- AM turn 100%
- PM turn 66% for all weather equipment, 33% otherwise.

Night attenuation

If turns are full days or longer, air unit attack and defense strengths are multiplied by 83% for ‘‘all weather’’ equipment, 66% otherwise.

Flanks and Rear Areas

Most units are assigned a mix of actively defending equipment (such as infantry or tanks) and passively defending equipment (such as artillery). Usually, passively defending equipment is significantly shielded from losses in combat. The theory is that things like artillery are deployed in rear areas and out of harm's way. Unfortunately, this isn't always the case.

In units attacked from opposite directions in the same turn, passively defending equipment (such as artillery) is forced to participate directly in combat. The attacks need not be combined. One unit can "pin" from one direction while another later executes the "flanking" attack. If a unit that attacked earlier in the turn is itself later attacked, the original attack is considered a "defense" for this purpose. This means that if a unit attacks to the south, but is itself later attacked from the north, it will suffer the flank attack penalty. Units are not subject to the flank attack penalty immediately after any move.

The facing of the 3d unit icon graphics on the map is not significant for this purpose.

Retreats

If a defending unit attempts to break off, it will look for a safe location in the direction of the nearest friendly cooperative headquarters or supply source. The unit will attempt to disengage and retreat into that safe location. If such a location is not available, the unit will instead have its readiness reduced to 30% and it will refuse further orders until it reorganizes. In practical terms, this reduces the unit to a milling mob of uncoordinated troops, which will offer little resistance if attacked again.

When a unit retreats after combat, nearby friendly units not directly involved in the combat may (depending on orders emphasis, proficiency, and circumstances) be subject to retreats.

Attack Complexity (Defined)

Attack complexity increases with the number of attacking units, the distance those units move before launching their attack, the cooperation level necessary for coordination between units of differing formations, and inclement weather or difficult terrain in and around the location of the attack.

Amphibious Attacks

Any attack launched from a deep-water location is considered an amphibious attack. These battles are resolved normally, except that if the attacker is unsuccessful his units will re-embark on their transports.

Airborne Attacks

Airborne attacks are resolved during movement. See Airborne Movement.

Airmobile Attacks

Airmobile attacks are resolved during movement. See Airmobile Movement.

Effects of Entraining Units

Units on board trains have their attack and defense strengths reduced to 25% of normal. They may defend, but may not launch attacks.

Your entire force movement allowances are adjusted

After combat, all of your units will have their remaining movement allowances adjusted to reflect the highest tactical round needed to resolve all attacks. Example: If the last used tactical round was round 7, all of your units will have their movement allowances limited to no more than 30% [(10-7)*10%] of their movement allowance at the beginning of the turn.

Turnover

Your turn will end if either of the following conditions apply:

- You have launched no attacks.
- The mean remaining movement allowance of your entire force is too small to allow for successful exploitation of your attacks.
- Your force fails a proficiency check. This is the primary use of the force proficiency value.

The Turn Ends

When both players have had an opportunity to issue orders to their forces and all combats are resolved, the turn ends. A new turn begins with Automatic Bookkeeping. This continues until the end of the scenario.

The Menu

Menu functions work according to Windows 95 conventions. Many game and editor functions are only available through the menu. Not all of these menu items are available at any given time.

The File Menu

- Begin New Game – Load a new scenario and start a new game.
- Resume Saved Game – Load an existing saved game file and resume that game.
- Save Game As… - Save the current game.
- Go to Editor – Exit the game and go to the scenario editor.
- New Scenario - Initialize a new scenario and go to the map editor.
- Open Scenario - Open an existing scenario file.
- Open Map – Open an existing map file.
- Open OOB – Open an existing OOB (Order of Battle) file in the Force Editor.
- Open Unit – Open an existing unit file in the Force Editor. The unit described in the file will be copied into your order of battle.
- Close - Close the application
- Save Scenario As - Save the current scenario.
- Save Map As – Save the current map.
- Create Map Metafile – Save the map as a single (usually very large – several MB) Windows Enhanced Metafile. You will need a good ‘‘painting’’ program to display or manipulate the EMF file.
- Save OOB As – Save an OOB file.
- Save Unit As – Save the current unit as a unit file.
- Dump Scenario As - Create a text file that completely describes the current scenario. This text file is commonly referred to as a ‘‘scenario dump’’.
- Go to Game - Exit the editor and play the game.

The Play Menu

- End Scenario – Ends the current scenario. Victory is determined normally, but may not be historically valid.
- Resolve Battles / End Turn – Resolve any planned attacks, and possibly turn control over to the other player. This has exactly the same effect as the Resolve Battles / End Turn button in the control panel.
- Computer Player – Change the computer player selection.
- Game Options
  - Standard Game Rules
  - Advanced Game Rules
  - Advanced Game Options (Advanced Rules) - Use this dialog to change rules or programmed opponent options before starting a scenario. Once a scenario begins, some options for that scenario cannot be changed.
- Undo - Undo the previous action. This is the same as clicking on the undo button in the control bar.

The View Menu

- Situation Briefing – Show the a report detailing the current game situation.
- Scenario Briefing – Show the scenario historical and special information article.
- Recent News – Show a report listing significant events that have occurred both in and out of theater.
- Air Briefing – Show a report giving current turn aircraft losses, Theater Air Superiority and Theater Interdiction levels.
- Air Units – Show a list of all air units, their locations and current missions.
- Order of Battle – Show a list of all units currently in theater (on the map).
- Weather Briefing – Show a current weather report, with a forecast for next turn.
- Theater Options – Show the theater options dialog.
- Expected Reinforcements – Show a list of all expected reinforcements and withdrawals.
- Recent Reinforcements – Show a list of any units received as reinforcements or withdrawn from the theater this turn.
- Inventory and Replacements – Show a list of all equipment assigned or available as replacements.
- Order of Battle – Show a list of all friendly units currently in theater.
- Scenario Properties – Show the completion status of the current scenario in the editor.
- Options Dialog – This calls up the Game Options Dialog. You can set all game options from here. You may also set these options individually using the Options menu item.
- Options: Most of these items are grouped as "radio buttons", and only one option is active within a group at any given time. Some of these options are not available unless you are playing under advanced rules.
    - Units: Icons – Strength: Traditional "NATO standard" unit icons are shown on the map, with unit strengths displayed at the bottom of the icon.
    - Units: Icons – Movement: Traditional "NATO standard" unit icons are shown on the map, with remaining unit movement capability displayed at the bottom of the icon.
    - Unit Visibility: Visible: Units are shown on the map.
    - Unit Visibility: Invisible: No units are shown on the map.
    - Unit 3d Bases: 3d Figures Bases: 3d figures are shown with bases.
    - Unit 3d Bases: 3d Figures No Bases: 3d figures are shown without bases.
    - Possession: Flags: Territorial ownership is indicated on the map by national flags.
    - Possession: Borders: Territorial ownership is indicated on the map by colored borders along the boundaries between the two forces.
    - Possession: Invisible
    - Place Names: Visible: Place names are shown on the map, below any visible unit icons.
    - Place Names: Floating: Place names are shown on the map, above any visible unit icons.
    - Place Names: Invisible: Place names are not shown on the map.
    - Formation Hilight: Visible: A "silver" cursor is placed in all locations where a unit of the current formation is present.
    - Formation Hilight: Invisible
    - Intro Cinematic: Show at startup – Show the game intro cinematic when the game is started.
    - Intro Cinematic: Do not show – Skip the intro cinematic when the game starts.
    - Location Grid: Visible: Use this to display a hexagonal grid overlay on your map.
    - Location Grid: Invisible: Use this to remove the hexagonal grid overlay from the map.
    - Movement Paths: Visible – Show projected movement paths.
    - Movement Paths: Invisible – Do not show projected movement paths.
    - Movement Paths: Floating – Show projected movement paths above unit icons.
    - Supply: Sources – Show supply sources in the map panel.
    - Supply: Invisible – Do not show supply sources or levels in the map panel.
    - Supply: Visible – Show the supply levels for all locations in the map panel.
    - Text Contrast: Standard – Show standard textured backgrounds.
    - Text Contrast: Highlight – Display text against a "shadow".
    - Text Contrast: Maximum – Replace all textured backgrounds with a dark charcoal gray background.
    - Weather: Visible – Show weather in the map and microview panels
    - Weather: Invisible – Do not show weather in the map or microview panels.
    - Map View: 2d Large - Set the map view to the large 2d mode.
    - Map View: 2d Small - Set the map view to the small 2d mode.
    - Map View: 3d Large - Set the map view to the large 3d mode.
    - Map View: 3d Small - Set the map view to the small 3d mode.

The Help Menu

- About The Operational Art: This shows credit and version info for the game.
- Help Topics: This calls up a Standard Windows help file.

The Sound Menu

- Background
  - Music – Turn the background music on, background battle sounds off.
  - Battle Sounds – Turn background battle sounds on, music off.
  - Music & Battle Sounds – Turn background music and battle sounds on.
  - No Background Sounds – Turn off all background sounds.
- Sound Effects
  - Sound Effects On – Turn the foreground sound effects on.
  - Sound Effects Off – Turn the foreground sound effects off.

The Edit Menu

The edit menu is only available in the editor. You may ignore this section if you do not intend to design scenarios.

- Undo - Undo the previous action. This is the same as clicking on the undo button in the control bar.
- Map Boundaries:
  - Set Map Boundaries – Start the Set Boundary dialog to set the boundaries of the current scenario map. A map must be at least 20 x 20 and no larger than 100 x 100.
  - Increase Top Margin – Add cells to the top of the map.
  - Increase Right Margin – Add cells to the right side of the map.
  - Increase Left Margin – Add cells to the left side of the map.
  - Increase Bottom Margin – Add cells to the bottom of the map.
  - Clip Top Margin – Remove cells from the top of the map.
  - Clip Right Margin – Remove cells from the right side of the map.
  - Clip Left Margin – Remove cells from the left side of the map.
  - Clip Bottom Margin – Remove cells from the bottom of the map.
- Environment: Set the scenario environmental conditions.
- Calendar: Set the scenario calendar.
- Events: Set the scenario events.
- Map: Create a map for the scenario.
- Forces: Create an organized list of units for use in the scenario.
- Set Replacements: Set up the replacement rates for all equipment types available in the scenario.
  - Replacements Editor – Start the Replacement Editor dialog to fine tune replacements for a scenario.
  - Default 1% Replacements – Set the replacement rate for all equipment in the current scenario to 1% of the total assigned equipment base on each turn.
  - Default 2% Replacements – Set the replacement rate for all equipment in the current scenario to 2% of the total assigned equipment base on each turn.
  - Unit Replacements Priorities – Set replacement priorities and eligibility for reconstitution for specific units.
- Deployment: Deploy the units in the OOB and assign formation objectives
- Briefings: Enter a text description or scenario result reports for the current scenario.
  - Scenario Briefing – Edit the scenario briefing.
  - Force 1 Victory Briefing – Edit the briefing that appears after a victory by the first force in the order of battle.
  - Force 2 Victory Briefing – Edit the briefing that appears after a victory by the second force in the order of battle.
  - No Victory (draw) Briefing – Edit the briefing that appears when a scenario ends in a draw.
- First Force: Set the force that will move first on the first turn of the scenario.
- Set Microview Icons: Units are shown as either blue or red icons in the microview display. You use this option to set which forces the colors should be assigned to.
- Set 3d Icon Tint: Equipment graphics are shown in the 3d map display using one of four possible “tints”. You use this option to set which tint is to be used by each force.
- Clear Map: Remove all terrain from the current map and replace it with open terrain.
- Set Force Characteristics
  - Force Proficiency – Set the force proficiency.
  - Force Supply stockpile levels – Set the force stockpile level.
  - Force guided weapons level – Set the force guided weapons level.
  - Force air refueling range multiplier – Set the force air refueling range multiplier.
  - Force NBC proficiency – Set the force nuclear, biological, and chemical proficiency.
  - Force Night combat proficiency – Set the force night combat proficiency.
  - Electronic support level – Set the force electronic support level.
- Remove All Units: Remove all deployed units from the map.
- Automatic Ownership: Calculate, from the positions of deployed units, the ownership of each location on the scenario map.
- Copy Current Formation – Make a copy of the current formation and insert it into the order of battle.
- Cut Current Formation – Cut the current formation from the order of battle and place it in the clipboard.
- Paste Formation – Paste the most recently cut formation from the clipboard into the order of battle.
- Modify Current Force – Modify the entire current force.
  - Unit Recolor 2D Icons – Replace the color scheme of the 2D icons for all units of the current force.
  - Unit Assigned Equipment – Modify assigned equipment levels for all units of the current force.
    - Add Equipment – Add a relative percentage to the currently assigned equipment levels of all units of the current force.
    - Subtract Equipment - Subtract a relative percentage to the currently assigned equipment levels of all units of the

current force.
        - Set Equipment – Set assigned equipment levels to a fixed percentage of the authorized levels of all units of the current force.
        - Randomize Equipment – Randomize the currently assigned equipment levels of all units of the current force by a relative percentage.
    - Unit Proficiency – Modify proficiency levels for all units of the current force.
        - Add Proficiency – Add to the proficiency levels for all units of the current force.
        - Subtract Proficiency – Subtract from the proficiency levels for all units of the current force.
        - Set Proficiency – Set the proficiency level for all units of the current force.
        - Randomize Proficiency – Randomize the proficiency levels for all units of the current force.
    - Unit Readiness – Modify readiness levels for all units of the current force.
        - Add Readiness - Add to the readiness levels for all units of the current force.
        - Subtract Readiness – Subtract from the readiness levels for all units of the current force.
        - Set Readiness – Set the readiness levels for all units of the current force.
        - Randomize Readiness – Randomize the readiness levels for all units of the current force.
    - Unit Supply – Modify the supply levels for all units of the current force.
        - Add Supply - Add to the supply levels for all units of the current force.
        - Subtract Supply – Subtract from the supply levels for all units of the current force.
        - Set Supply – Set the supply levels for all units of the current force.
        - Randomize Supply – Randomize the supply levels for all units of the current force.
    - Unit Rename – Search and replace sub strings in names of all units of the current force.
    - Formation Proficiency – Modify the proficiency levels for all formations of the current force.
        - Add Proficiency - Add to the proficiency levels for all formations of the current force.
        - Subtract Proficiency – Subtract from the proficiency levels for all formations of the current force.
        - Set Proficiency – Set the proficiency levels for all formations of the current force.
        - Randomize Proficiency – Randomize the proficiency levels for all formations of the current force.
    - Formation Supply – Modify the supply levels for all formations of the current force.
        - Add Supply - Add to the supply levels for all formations of the current force.
        - Subtract Supply – Subtract from the supply levels for all formations of the current force.
        - Set Supply – Set the supply levels for all formations of the current force.
        - Randomize Supply – Randomize the supply levels for all formations of the current force.
    - Formation Rename – Search and replace sub strings in names of all formations of the current force.
    - Unit Recolor 2D Icons. After selecting the menu item, select the icon color scheme to be replaced, then the new color scheme.
- Modify Current Formation – Modify the entire current formation.
    - Unit Recolor 2D Icons – Replace the color scheme of the 2D icons for all units of the current formation.
    - Unit Assigned Equipment – Modify assigned equipment levels for all units of the current formation.
        - Add Equipment – Add a relative percentage to the currently assigned equipment levels of all units of the current formation.
        - Subtract Equipment – Subtract a relative percentage from the currently assigned equipment levels of all units of the current formation.
        - Set Equipment – Set assigned equipment levels to a fixed percentage of the authorized levels of all units of the current formation.
        - Randomize Equipment – Randomize the currently assigned equipment levels of all units of the current formation by a relative percentage.
    - Unit Proficiency – Modify proficiency levels for all units of the current formation.
        - Add Proficiency – Add to the proficiency levels for all units of the current formation.
        - Subtract Proficiency – Subtract from the proficiency levels for all units of the current formation.
        - Set Proficiency – Set the proficiency level for all units of the current formation.
        - Randomize Proficiency – Randomize the proficiency levels for all units of the current formation.
    - Unit Readiness – Modify readiness levels for all units of the current formation.
        - Add Readiness - Add to the readiness levels for all units of the current formation.
        - Subtract Readiness – Subtract from the readiness levels for all units of the current formation.
        - Set Readiness – Set the readiness levels for all units of the current formation.
        - Randomize Readiness – Randomize the readiness levels for all units of the current force.
    - Unit Supply – Modify supply levels for all units of the current formation.
        - Add Supply - Add to the supply levels for all units of the current formation.

        - Subtract Supply – Subtract from the supply levels for all units of the current formation.
        - Set Supply – Set the supply levels for all units of the current formation.
        - Randomize Supply – Randomize the supply levels for all units of the current formation.
    - Unit Rename – Search and replace sub strings in names of all units of the current formation.
    - Formation Proficiency – Modify the proficiency level of the current formation.
        - Set Proficiency – Set the proficiency level of the current formation.
        - Randomize Proficiency – Randomize the proficiency of the current formation.
    - Formation Supply – Modify the supply level of the current formation.
        - Set Supply – Set the supply level of the current formation.
        - Randomize Supply – Randomize the supply level of the current formation.
    - Formation Rename – Rename the current formation.
    - Unit Recolor 2D Icons. After selecting the menu item, select the icon color scheme to be replaced, then the new color scheme.
- Modify Current Unit – Modify the current unit only.
    - Unit Assigned Equipment
        - Add Equipment – Add a relative percentage to the currently assigned equipment levels of the current unit.
        - Subtract Equipment - Subtract a relative percentage to the currently assigned equipment levels of the current unit.
        - Set Equipment – Set assigned equipment levels of the current unit to a fixed percentage of the authorized levels.
        - Randomize Equipment – Randomize the currently assigned equipment levels of the current unit by a relative percentage.
    - Unit Proficiency – Modify the proficiency of the current unit.
        - Set Proficiency – Set the proficiency level of the current unit.
        - Randomize Proficiency – Randomize the proficiency level of the current unit.
    - Unit Readiness – Modify the readiness of the current unit.
        - Set Readiness – Set the readiness level of the current unit.
        - Randomize Readiness – Randomize the readiness level of the current unit.
    - Unit Supply – Modify the supply level of the current unit.
        - Set Supply – Set the supply level of the current unit.
        - Randomize Supply – Randomize the supply level of the current unit.
    - Unit Rename – Rename the current unit.
- Objective Tracks
    - Track 1: Select to edit track 1 formation objectives (default).
    - Track 2: Select to edit track 2 formation objectives.
    - Track 3: Select to edit track 3 formation objectives.
    - Copy Track 1 to Track 2: Copy all track 1 formation objectives to track 2.
    - Copy Track 1 to Track 3: Copy all track 1 formation objectives to track 3.

The Mouse Cursor

The mouse cursor shape is significant. In addition to the standard Windows cursor shapes used to manage the game Window, there are several game defined shapes:

- The pointing finger shape generally indicates a button or control that can be pushed to cause some action.
- The barred circle shape is used where mouse clicks will have no effect.
- The double concentric circle is used to indicate that a unit can move to a given map location.
- The crosshair is used to indicate a target for an attack or bombardment. In the map editor it is used to indicate a target for a map editing operation.
- The open box cursor is used to indicate the area to be centered if you click within the microview.
- Various arrow cursors indicate scrolling directions for the map and microview.

Unit Health Indicators

Unit Health Indicators (Standard Rules Only)

If for some reason you can't move a unit, a red band will be shown across the bottom of its 2d unit icon. This might occur as a result of a combat, or because the unit is prevented from moving by special scenario rules. If the unit is scheduled to participate in an attack a triangular brass-colored attack indicator will appear along the edge of the icon, pointing in the direction of the attack objective.

Unit Health Indicators (Advanced Rules)

Unit health is an average of the unit's supply, readiness, and fraction of assigned vs. authorized equipment. It is not actually used in any game calculations, but it can be useful in keeping track of how your units are doing. Health is shown as a colored light in the health indicator of the Unit Panel and on the standard unit icons. The colors stand for the following ranges:

- 100%...86% green
- 85%...71% yellow-green
- 70%...56% yellow
- 55%...41% orange
- 40%...00% red

Standard Unit Icons

Regardless of the map and unit display mode you are using the play the game, the standard 2d unit icons are used in the Unit Panel and Combat Planning Dialog. If you are playing in 2d mode, they are also used on the map. There is a lot of information packed into these icons.

Unit Icon Displays – Advanced Rules

The colors of the icons are a general guide to how well your units can cooperate. Units of different formations will tend to cooperate better in attacks if they have similar colors. They will cooperate best if the colors are identical.

A unit health indicator light appears in the upper right corner of the icon.

A symbol in the center of the icon shows the unit type.

A unit size symbol appears above the type symbol.

Unit attack and defense strengths or movement allowance appear below the type symbol. If the unit is not fully available for orders, the numbers are shown in a colored band:

- Yellow -The units are in reserve. This is the result of a special scenario rule.
- Orange - The unit or its parent formation are reorganizing.
- Red – The unit is routed.

Loss tolerance pips appear to the left of the type symbol. One pip if the unit is to minimize losses, two for limited losses, and three if the unit is to ignore losses.

Deployment / mission letters appear to the right of the type symbol. For most units this represents the unit's deployment. For air units, it represents the unit's mission.

If the unit is scheduled to participate in an attack a triangular gold attack indicator will appear along the edge of the icon, pointing in the direction of the attack objective.

Guerrilla units

Guerrilla units always disengage without cost, as special forces units do.

Guerrilla units are very difficult to spot, particularly from air or helicopter units.

Guerrilla units will not change the ownership of locations while moving. Only after movement will guerrilla units change the ownership of the location they occupy.

Guerrilla unit attack and defense strengths are doubled when attacking from locations that were enemy owned at the beginning of the turn.

Guerrilla units always draw at least "normal" supply, regardless of whether their location is friendly supplied. If a higher level of supply is available, the unit benefits normally.

Airmobile Units

These units are capable of airmobile movement if sufficient airmobile transport capacity (provided by helicopter transport units) is available within 200km of their location.

Airborne Units

These units are capable of airborne movement if sufficient air transport capacity is available. They are also capable of airmobile movement.

The Unit Report (Advanced Rules)

You can bring up a detailed Unit Report by right clicking in The Unit Panel or by right clicking on a unit and selecting the Unit Report option from the resulting popup menu. This dialog shows all available information for the unit.

The data pane at the top of the dialog shows the unit's current status, capabilities, transport weight in tons, and other characteristics.

The strength pane shows the unit's various strengths.

The special abilities pane lists any special abilities the unit has, such as engineering, fording support, or reconnaissance.

The equipment pane shows a complete list of all equipment assigned/authorized for the unit. You can click on the equipment buttons for additional information on any piece of equipment authorized for the unit.

The control bar buttons allow you to change the unit's deployment and loss tolerance, switch to view the next or previous unit in your force, cycle through the units grouped in the same location, scroll through the equipment list if necessary, exit the dialog, or view the unit's parent formation.

There is additional information available in the scenario editor. The unit's transport requirement is available in the unit data pane, and a veteran/untried toggle button is available in the control bar.

The Formation Report (Advanced Rules)

This dialog shows all available information for one formation.

The data pane at the top of the dialog shows the formation's current status, support scope (how well its units cooperate with units of other formations), proficiency, and supply distribution efficiency.

The unit list pane below shows all units assigned to the formation, their locations and essential information. Clicking on a unit name button will center the map display on that unit. You can change a unit's deployment or mission by clicking on its deployment button.

The next and previous formation buttons in the control bar are used to view your other formations, and the exit button exits the dialog. If scroll buttons appear, they can be used to scroll through additional units assigned to the formation.

The Air Units Report

This dialog shows all of your air units, their missions, locations, and essential information. It effectively gathers all of your air units into a virtual formation so you don't have to hunt for them all over the theater. If you click on a unit name button the map will center on that unit. You can use the mission button to change the unit's mission. The scroll buttons in the control bar are used to scroll through your air units if there are more than will fit in the display area, and the exit button exits the dialog.

The Attack Planning Dialog (Advanced Rules)

The Attack Planning Dialog gives all the information necessary to plan an attack in detail. In most cases, it is not necessary to use this feature to plan your attacks. But it can be helpful if you want to fine tune an attack, and while you are learning how to play the game.

The objective pane in the center of the dialog shows the objective of the attack, and all information available regarding enemy units in the objective. The six surrounding panes show all terrain and units in the locations surrounding the objective. Left clicking on your units in the surrounding panes commits or un-commits your units to the attack with their current loss tolerances. Right clicking on your units brings up a list of options for changing the attack plan, including settings for loss tolerances.

The support pane lists all long range units available to support the attack. These units will automatically support the combat if you make no selections. You may also commit them exclusively to this attack by clicking on them, but this will make them unavailable to support other attacks.

The time expended pane shows the how much of your turn will be used after the attack is executed, assuming all goes well. If the attack is not overwhelming and one or both sides in the attack have high loss tolerances, much more time may be expended.

The control bar buttons are used to switch the unit icon display between strengths and movement allowances, and the exit button is used to exit the dialog.

Total attack and defense strength information is available in the strength panes flanking the control bar.

The Situation Briefing

The Situation Briefing gives an overall evaluation of the current game situation. Information is arranged in five panes. The calendar pane shows the current player and date, the most likely end date for the scenario, and the approximate number of turns remaining. The force pane gives information on your overall force proficiency and supply stockpile level. The special weapons pane shows who is using chemical or nuclear weapons. The theater pane lists your force's reconnaissance and transport capacities. The victory pane shows who is currently winning the scenario. The control bar exit button exits the dialog.

The Scenario Briefing

The Scenario Briefing gives a lengthy description of a scenario, including scale, environmental information, special considerations and a brief history of the battle or campaign portrayed by the scenario.

The Air Briefing

The Air Briefing gives a brief rundown of the current situation in the air over the theater.

Current turn aircraft losses are listed in the aircraft losses pane. Only aircraft actually destroyed are listed. Damaged aircraft (those sent to the replacement pool) are not included in the loss report. The air superiority pane shows the theater air superiority levels, a general indicator of who controls the air over the theater. And the interdiction pane shows both forces' theater interdiction levels, a general gauge of each force's efforts to impair enemy supply distribution and land unit movement. Use the control bar exit button to exit the dialog.

The Weather Briefing (Advanced Rules)

The Weather Briefing shows a microview scale map of the entire theater with a visibility and precipitation overlay. Above the weather map is a description of current and forecast weather in each weather zone. If there is more than one weather zone, the break points are indicated at the edge of the weather map. Use the control bar exit button to exit the dialog.

The Expected Reinforcements Briefing

The Expected Reinforcements Briefing lists all expected reinforcements and withdrawals, their projected entry or exit turns and locations, and unit types. Use the scroll buttons in the control bar to scroll through the list if necessary. The exit button in the control bar exits the dialog.

The Recent Reinforcements Briefing

The Recent Reinforcements Briefing lists all reinforcements and withdrawals for this turn, their locations and unit types. Use the scroll buttons in the control bar to scroll through the list if necessary. The exit button in the control bar exits the dialog.

The Inventory and Replacements Briefing

The Inventory and Replacements Briefing lists all available replacements, the number of items on hand (available for immediate distribution), rate of appearance, the range of turns in which replacements will be received, cumulative losses, and the current total number of items assigned to units in the theater. Use the scroll buttons in the control bar to scroll through the list if necessary. The exit button in the control bar exits the dialog.

The editor version of this dialog differs from the game version. Rate of appearance, beginning turn, and end turn are all represented by buttons. You use these buttons to change the values. The assigned equipment totals in the editor include all assigned equipment regardless of whether the units are deployed on the map (in theater).

Recent News

The Recent News Briefing lists significant occurrences since the beginning of the scenario. Use the scroll buttons in the control bar to scroll through the list if necessary. The exit button in the control bar exits the dialog.

Creating Scenarios With the Scenario Editor

The standard game scenarios were all created using the scenario editor included with the program. Designing all but the simplest scenarios is actually quite a bit of work, but if you have the historical references and inclination there is no reason why your scenarios can't be as thorough as ours.

All editor functions are available through the Edit Menu. Only the "large 2d" map display is supported by the editor.

The Scenario

The scenario is a complete description of a historical battle or campaign, comprising the following elements:

- A Map: This is created using the Map Editor. Maps may be up to 100x100 locations in extent, with up to 200 named locations.
- An Order of Battle describing the two opposing forces: This is created using the Force Editor. Each force may have up to 500 units in 100 formations.
- Deployments of the opposing forces: These are defined using the Deployment Editor.
- A calendar: This is defined using the Calendar Editor
- An environment: This is defined using the Environment Editor.
- Replacements: Use the replacement editor to set equipment stockpiles and replacement rates.

Optionally, a scenario may also include:

- An event list: This is created using the Event Editor.
- A briefing. See The Edit Menu .

The Map Editor

The map editor display is divided into several regions: the window frame, scroll frame, map panel, information panel, and the control panel (current terrain display, control bar, terrain palette). If your window is large enough, there will also be microview panel.

The Map Editor Control Panel

This panel is shown along the right side of the display. It is divided into three areas: the current terrain display, the control bar, and the terrain palette.

The current terrain is shown in the current terrain pane.

The four buttons in the control bar are undo, scroll terrain palette back, scroll terrain palette forward, and editor draw mode select.

- The undo button is used to undo the previous action.
- The terrain palette scroll buttons are used to change the portion of the terrain palette available for selection as the current terrain.

The editor draw mode select is used to specify the action to be performed if you select a location in the map panel.

The Current Terrain

The current terrain is shown in the upper right corner of the display. It is used to modify selected map locations according to the editor draw mode. You select the current terrain by clicking within the terrain palette.

The Map Editor Draw Mode

You select most editor draw modes by clicking on the draw mode button in the control bar. The draw mode determines what actually happens when you left click in the map panel. You can also right click in the map panel to select a one time draw mode from a popup menu for just that location.

- Point Draw: Any single location selected in the map will be modified. If the location already contains the current terrain, your click will manually make or break a terrain connection to the nearest location side. If the location does not contain the current terrain, the current terrain will be added and all possible location side connections will automatically be established.
- Blob Draw: Any single location and it's surrounding six locations will be filled with the current terrain.
- Line Draw: A line of locations from the last selected location to the most recently selected location will be filled with the current terrain.
- Fill Draw: An area bounded by the current terrain will be filled with the current terrain.
- Erase Draw: If the location contains the current terrain, it will be removed.
- Place Name: You can enter a name for the selected location.
- Distance: (Available only from popup menu) You can set a distance value for the location. All movement across a hexside between locations with different distance values is assumed to occur across the difference in distance. The maximum distance is 199, and the minimum (and default) is 0.
- Blow/Build Bridges: (Available only from popup menu) You can build or blow bridges in the location.
- Set Entrenchment (available only from the popup menu) Sets the location entrenchment level to a value ranging from 0 to 100.
- Place a Border draws a permanent border graphic on the map.
- Set Exclusion Zone 1 or 2: (Available only from popup menu) You can set an exclusion zone. The area is effectively non playable in the game, but may be removed by an event.

How to Edit a Map

Creating a map is simply a matter of selecting terrain types and clicking within the map panel to paint the terrain onto the map. As you draw, the map features are automatically contoured or connected. You can override the automatically selected contour or connections in point draw mode by clicking within the location to make or break new connections.

A Sample Map Editing Session

Maximize the window. Move your mouse cursor over the map editor draw mode button and make sure it is set to the point draw mode. Click on the scroll terrain palette forward button in the control bar to see all available tiles in the terrain palette. Repeated clicks will continue to scroll through the available terrain types.

Select a terrain type from the terrain palette. Left click within the map panel. You will see the selected location fill with the current terrain. Now left click on an adjacent location. That location will also fill with the current terrain, and connections will automatically be established between the two locations. Now left click near a hexagonal boundary between two connected locations. The connection will be broken. Left click again and the connection will be re established.

Left click on an empty location. Now click the undo button. The location you filled will be restored to its original condition.

Now, click on the editor draw mode button in the control bar. It will change to the blob draw mode. Left click on an empty area of the map. A seven location area centered on the location you selected will fill with the current terrain.

Click on the editor draw mode button to select the line draw mode. Now left click on any location in the map panel. A line of locations from the last selected location will be filled with the current terrain. Draw a few more lines until they completely enclose an area of the map.

Click on the editor draw mode button to select the fill draw mode. Now left click on an empty location within the area you outlined previously. The region will fill with the current terrain.

Click on the editor draw mode button to change to the erase draw mode. Now left click on a location containing the current terrain. The terrain will be removed from the location.

You may also right click on map locations. The effect is similar to left clicks except that you may select a drawing action from a pop up menu. This is more flexible than left clicking, but depending on the kind of editing you are doing at the time it can require more mouse clicks to do the same job.

You should have a simple map on screen now. Move your mouse cursor to the scroll frame to scroll the map.

Generally you should "rough in" your map first, clicking to drop terrain on the map and allowing the automatic terrain linking function to connect the tiles for the best display. Draw coastlines first, followed by isolated major terrain features. Once you have the basic terrain drawn, you can return to the point draw mode to click within locations (near edges) to manually make and break terrain connections. This will generally be necessary for linear features such as roads, rivers, and railroads.

Once your map is fully defined, you can use Edit Map Boundaries to fix the size of the map. These map boundary functions can also clip margins or insert additional space along edges if you need it.

Be sure to save your work frequently.

The Force Editor

The force editor is used to create a complete order of battle (an organized list of all units and formations) for a scenario and can be reached by selecting the Edit Force menu item.

The force editor display is implemented as a fixed size dialog. It is divided into four regions: the window frame, the unit control panel, the general control panel, and the information panel. The information and displays within the general control panel change depending upon your general editing focus. Many special purpose global force modification functions are available in the Edit menu.

The Force Editor Editing Focus

This setting affects the general control panel display on the right side of the force editor.

- Available Systems: This shows a list of all available weapon systems in the game database.
- Current Force: This shows a complete list of all units in the current force.
- Current Formation: This shows all information for the current formation.

You change the editing focus by clicking on buttons at the bottom of the general control panel.

The Unit Control Panel

This is the square area to the left of the Force Editor display. It always shows a description of the current unit.

At the top of the Panel you will find the unit name button. Click here to change the unit's name.

Just below are the unit size symbol button, the unit icon colors button, and the unit icon type button. All of these buttons control the graphic appearance of the unit icon on the map, and can have an effect on play. The size symbol and icon type buttons are used to set NATO standard military symbols for the unit's map appearance. Some icon types confer specific abilities on the unit. See the Unit Icon Symbols appendix in your player's guide for additional information on unit icon effects. The selection of unit icon colors is also significant, as the command and control rules key on the color selections you make for your units. Click on any of these buttons to bring up a self explanatory selection dialog.

Within the row of buttons along the top of the panel is a short text description of the current unit. These numbers show the unit's current strengths and movement allowance. Unit displayed strengths are scaled on the fly as you make changes to units. This means that you may see fluctuations in the displayed strengths of your units as you create the first few units in a force. This is normal, and will not occur in the game since the scaling constant is fixed when a scenario is loaded.

In the center of the panel is a list of all equipment currently assigned or authorized for the unit. In some cases the assigned and authorized numbers may not match. Right click on the green equipment buttons for information about the particular type of equipment. Left click to change the amount of equipment assigned to the unit.

At the bottom of the unit control panel is a row of buttons. From left to right these are: previous unit, next unit, scroll equipment list up and down, current unit characteristics, copy current unit, and delete current unit. The previous and next unit buttons are used to flip through your units (making each, in turn, the current unit) one at a time. The characteristics button is used to set the unit proficiency, readiness, and supply levels. Copy current unit makes a copy of the current unit and makes the copy the new current unit. Delete unit removes the current unit from the force.

The General Control Panel

This is the square area to the right of the Force Editor display. Depending upon the editor scope, it always shows a list of available systems, current force, or current formation.

Available Systems Control Panel

This shows a list of all weapon systems available in the game database. To aid in rapid location of specific systems, the list is organized into the following categories: Infantry & Support Troops, Guns & Mortars, Self Propelled Guns & Mortars, Rockets & Missiles, Anti Aircraft Weapons, Reconnaissance Vehicles, Transport, APC's, & IFV's, Light Tanks & Anti Tank Vehicles, Medium & Heavy Tanks, Ships, Helicopters, and Aircraft. You can quickly jump to the start of any particular category by clicking anywhere to the right of the system buttons.

Left click on a system to authorize and assign it to the current unit. A dialog will pop up asking you how many of the systems you wish to authorize for the unit. Note: When you make this selection you are actually setting the authorized level of equipment for the unit. This represents a normal maximum number of the systems in the unit rather than the current assigned number. Since in most cases the assigned and authorized quantities will be closely matched during scenario design, the editor automatically assigns the authorized quantity of equipment to the unit. A similar button in the unit control panel sets the assigned quantity, which may be more or fewer than the authorized quantity. As in the unit control panel, a right click on a system button will bring up an information display for the selected equipment type.

At the bottom of the Available Systems panel is a row of buttons. From left to right these are scroll to previous weapon, scroll to next weapon, display current force, display current formation, switch forces, and exit force editor. Use the scrolling buttons to move through the list of available systems. Left clicking scrolls the list by one system. Right clicking scrolls by a complete page. Click on the display current force button to switch the editor scope to Current Force. Click the display current formation button to switch the editor scope to Current Formation. Click on the switch forces button to change the current force from one side to the other. And select the exit force editor button to return to the map editor.

Current Force Control Panel

This shows a list of all units defined for the current force.

At the top of the panel is the force name button. Click here to change the name of the current force.

Below the name button is a list of units in the current force. The current unit is indicated by silver text. To the left of each unit button is an assignment button showing either "unassigned" or the name of the formation the unit is assigned to.

Left click on any unit name button to make it the current unit.

Right click on a unit name button to cut it from the force for later pasting. To paste the cut unit, move the mouse to where you wish to insert it and right click again. If you accidentally cut a unit, you can drop it back in its proper place by right clicking again without moving the mouse.

Left click on an assignment button to change a unit's assignment. The effects will vary. If the unit is currently assigned, it and all following units of the same formation will become unassigned. If the unit is unassigned, it and all following unassigned units will be either attached to an existing formation or assigned to a new formation (your choice).

Right click on an assignment button to cut the indicated formation the current formation from the force. To paste the formation back into the force, move the cursor to where you want to insert it and right click again.

At the bottom of the Current Force Control Panel is a row of buttons. From left to right: force characteristics, scroll to previous unit, scroll to next unit, display weapons, display current formation, switch forces, and exit force editor. The force characteristics button looks like a flag. Use it to change the national flag of the force, as well as the overall force proficiency and supply stockpile levels. Use the scrolling buttons to move through the list of units in the force. Left click on a button to scroll by one unit. Right click to scroll by an entire page. Use the display weapons button to switch the editor scope to Available Systems. The display current formation button will switch the editor scope to Current Formation. Click on the switch forces button to change the current force from one side to the other. And select the exit force editor button to return to the map editor.

Current Formation Control Panel

This shows all available information for the current formation.

At the top of the panel you will find the formation name and support level buttons. Click on the formation name button to change the name of the current formation. Click on the formation support level button to change the formation's support level. (See Support Levels)

Below the name and support buttons is the list of units assigned to the current formation. Click on any unit name button to make that unit the current unit. To the right of each unit name is an abbreviated list of unit strengths and movement allowance. There may be more units than will fit within the display area. If so, you can scroll the unit list using the scroll buttons to the right of the unit list.

At the bottom of the Current Formation Control Panel is a row of buttons. From left to right: previous formation, next formation, display current force, display weapons, formation proficiency, formation supply distribution efficiency, and exit editor. The previous and next formation buttons are used to flip through your formations one at a time. Use the display weapons button to switch the editor scope to Available Systems. The display current force button will switch the editor scope to Current Force. Click on the switch forces button to change the current force from one side to the other. And select the exit force editor button to return to the map editor.

How to Edit a Force

Select the Edit Force menu item. The Force Editor dialog will pop up.

Let's create a unit. Move your mouse cursor over to the available systems control panel and click within the panel, to the right of the weapon system buttons. From the dialog select the "Medium & Heavy Tanks" button. This will quickly drop to that part of the weapon system database.

Now move your mouse pointer down to the scroll to next weapon system button and right click five times to scroll by five entire pages. You should be looking at a list of Soviet / Russian armored equipment. If not, scroll around using the next / previous buttons until you see a button labeled "T-62 (early)".

click on the "T-62 (early)" button.

A "how many" dialog will pop up. Using your keyboard, enter the number 96.

As you did before, move your mouse cursor over to the available systems control panel and click within the panel, to the right of the weapon system buttons. Select the "Anti Aircraft Weapons" button.

Scroll down using either the left (one line) or right (one page) mouse button until you find a button labeled "ZSU-23-4 SPAAG".

Click on the "ZSU-23-4 SPAAG" button.

A "how many" dialog will pop up. Using your keyboard, enter the number 6.

Now use the same procedure to add 3 BRM Reconnaissance vehicles, 12 Engineer Squads, 3 BRDM-2 Scouts, 4 BTR-50's, and 8 Trucks. You have just authorized the equipment for a 1973 Syrian Armored Brigade.

Now click on the name button at the top of the Unit Control Panel to change the name of the unit to "91st Armor". Click on the unit size symbol button and select the brigade symbol (X). Click on the unit icon colors button to select a green icon with black interior. If the icon type button to the right does not show a NATO standard armor symbol, click on it and select the symbol from the dialog that pops up.

Move your mouse to the rows of buttons at the bottom of the Unit Control Panel and click on the "Proficiency, readiness, or supply" button to set those values for the unit.

That's it! the 91st Armored Brigade is now fully defined.

If you click on the "copy unit" button at the bottom of the display once, a copy of the unit will be created.

Click on the display current force button at the bottom of the Available Systems panel. The Force Control Panel will be displayed and you should see two units, as shown below. These are your original "91st Armored Brigade, and the copy you made (copies are indicated by the "+" sign).

You can select each in turn (click on the name on the Force Panel; a selected unit's name is shown in white; non-selected units' are printed in yellow). You can then rename the selected unit using the unit control panel name button (at the top of the Control Panel on the left side of the Force editor).

Click on the unassigned button at the top right of the Force Control Panel. This will automatically assign all unassigned units directly below that unit to the same formation. Note that if you instead click on the unassigned unit button for the bottom unit in the list, only that unit will be assigned to a formation. To undo a formation assignment (to "unassign" a unit) you can left click on the button listing the formation name; to delete the unit, right click on the same button. If you clicked on the top "Unassigned" button, as instructed, all units should now be listed in the "1st Formation", as shown in the illustration below.

If you wish, you can click on the flag button at bottom left to assign the appropriate national flag for the force, as well as the overall force proficiency and supply stockpile level.

Click on the display current formation button at the bottom of the display to change to the Formation Control Panel, as shown below.

Click on the formation name button to change the name to 1st Syrian Div, then click on the formation support level button just to the left until it shows "internal support". Units of the formation will now be limited in its ability to cooperate with other units of different parent formations.

You can also use the formation proficiency and supply distribution efficiency buttons to enter appropriate values for the formation as a whole.

Click on the display weapons button to change the editor scope back to Available Systems.

Then click on the switch sides button. You can now define an opposing force (say Israeli 1973) in the same way.

Once all units for both sides have been fully defined and assigned to formations, you are ready to deploy your forces to the map using the deployment function.

The preceding example was set up to show how to create a simple force. If you are creating a larger force it is usually most efficient to create several prototype units and make multiple copies of those to create all the units for your force. For example, you might create one typical infantry unit, a typical armor unit, a typical artillery unit, etc. Then use the unit cut / paste feature to create enough copies of your prototype units to flesh out your force. It will ease your task if you arrange the units so that they are ready for organization into formations. Group the units so that all you want assigned to the first formation are at the top of the list, units of the second formation next, etc. Then make any modifications necessary to individual units to customize them as needed for your scenario – names, variations in equipment and strengths, etc. Finally, after all your units are created, assign them to formations. Do one force at a time.

Be sure to save your work frequently.

Advanced Force Editor Functions

A large number of advanced editor features are available from the Edit Modify Current Force, Modify Current Formation, and Modify Current Unit menu items. It is possible to modify all or part of a force, including global search and replace unit and formation renaming. Please see the description of The Edit Menu for a brief description of these functions.

The Environment Editor

The environment editor is used to set the scenario environment, which includes the following elements:

- Map Scale: Each map location can be 2.5, 5, 10, 15, 20, 25, or 50 kilometers across. This affects game movement and the map size calculation used to determine the number and location of weather zones.
- Climate Area: If the map is large enough, it will be divided into as many as three weather zones. Set this value to select the direction from which warm and cold fronts arrive. Unless you wish to include weather systems (cold or warm fronts) in your scenario, the equatorial setting should be used. Other than specifying weather front directions this setting is not directly visible within the game, and has no direct bearing on game play.
- Precipitation: Precipitation may be heavy, moderate, light, occasional, or none. This is a global likelihood value, and can be modified by terrain.
- Temperature: The temperature in any particular weather zone may be frozen (levels 1 through 3), cold, cool, moderate, warm, or hot. If your map is zonal, this selection will be for the most extreme zone (north for northern, south for southern, all for equatorial) with less extreme zones being progressively warmer.

Climate Area is an advanced feature, and need not be used in most cases. It is intended for use by advanced scenario designers who wish to model things like cold and warm fronts, seasonal weather changes, etc. Proper use of zone polarity requires use of the event editor.

Weather Zones

If the climate area is set to northern or southern and the map is at least 600 kilometers from north to south, the map will be divided into weather zones. The most extreme zone in a northern map is the northern zone, and the least extreme zone is the southern zone. The opposite is true for a southern map. To avoid zonal effects, select an equatorial climate area.

On zonal maps, weather effects (triggered by events – see The Event Engine) will progress from zone to zone. Cool fronts progress from the most extreme zone to the least extreme zone. Warm fronts progress from the least extreme zone to the most extreme zone. Depending upon the precipitation likelihood, storms may occur in one or more (possibly not all) zones as fronts pass through.

Weather Zones (Northern or Southern Climate Areas)

0…599 kilometers	1
600…1199 kilometers	2
1200+ kilometers	3

Weather Zone Panes

If your scenario has more than one weather zone, you can set separate starting values for precipitation (rain or snow), visibility (cloudiness), and temperatures for each zone.

The Calendar Editor

The calendar editor is used to set the scenario calendar, which includes the following elements:

- Turn Length: Turn length can be six hours, half day, full day, half week, or full week. This affects movement, weather progression, and the availability of day / night effects.
- Start Hour: This value is meaningful only if the turn length setting is less than "full day". AM turns are daylight turns. PM turns are night turns.
- Start Day: This is the date of the first turn of the scenario. You can set any valid day, but if the turn length is half week or full week subsequent dates will be rounded to appropriate values.
- Start Month: This is the first month of the scenario.
- Start Year: This is the first year of the scenario. You can only set the last two digits.
- Last Turn: This is the nominal last turn of the scenario. Normally, a scenario will not end before this turn. It is possible that the scenario can be longer. This value can be modified during play by the event editor.

Introduction to the Event Engine

WARNING: THE EVENT ENGINE IS VERY COMPLEX. It was designed for optional use by advanced scenario designers. An event list is essentially a computer program designed to be executed by an interpreter called the event engine. You need not use the event editor for your scenarios, and its use is not recommended for first time scenario designers.

The event editor is used to define the event list for a scenario. Any scenario may have a maximum of 500 events defined in the event list. The event engine is a very powerful feature, allowing the inclusion of scripted historical detail ranging from simple news strings to complex probability controlled branching.

The Structure of an Event

An event is defined by the following elements: a trigger, an effect, a location, a value or radius, a chance of occurrence, a turn range, a news string, and a status. Except for one exception, explained below, all events can only be activated one time.

Event Triggers

An event is set into motion by a trigger. Allowed triggers:

- Force 1 or 2 occupies a location: Occupation of any location within the given radius will serve as a trigger.
- Timer: The event activates on a specified turn.
- Player 1 or 2 winning (victory differential). The event is activated if the victory differential reaches the specified value.
- Other event activated: The event is activated after another specified event is activated.
- Other event cancelled: The event is activated after another specified event is cancelled.
- Player 1 or 2 uses chemical weapons anywhere on the map.
- Player 1 or 2 uses nuclear weapons anywhere on the map.
- Force 1 Attacks or Force 2 Attacks. These triggers are similar to the Force 1 Occupies and Force 2 Occupies triggers. The event is triggered if there is an attack by the indicated force within the event check radius, or if any terrain becomes controlled by the force within the radius. This means that the "Attack" trigger includes the "Occupied" trigger in addition to attack detection.
- Variable value: Event triggers when the event engine variable reaches a specific value.
- Unit destroyed: Event triggers when the specific unit has been destroyed or disbanded (not withdrawn).

Each event has a chance to have an effect. In most cases, this will be 100%. If an effect does not occur because it fails this check, it is considered ‘‘cancelled’’. If the event passes the check, it is considered ‘‘activated’’. This can in turn cause other events to be activated or cancelled.

Each event has a turn range. In most cases, this will be 1 turn. If a larger range is specified, the actual occurrence of the event can activate (with equal chance) in any turn from the turn of triggering to that turn plus the turn range. The check for activation of an event with less than 100% chance to occur only happens once regardless of the turn range. The activation check is made first, and the actual turn of occurrence is calculated after it is determined that the event is to occur. Example: An event scheduled to be triggered on turn 5, with a turn range of 4 and a chance of activation of 75%. There is a 75% chance (one time check) that the event will occur. If it does occur, it will actually be activated on turn 5, 6, 7, or 8.

Event Effects

When an event is set into motion, it has an effect. Allowed effects:

- Force 1 or 2 increase victory level: The specified value (see below) is added to the victory level for the indicated force.
- Force 1 or 2 experiences refugee effects: The indicated force suffers refugee effects within a radius (see below) of the specified location. The activation or cancellation of another event, typically an occupation event, should be the trigger this for type of event.
- Storms: Inclement weather occurs. This affects air units, ground unit movement, and some terrain types.
- Warm Front: The least extreme weather zone (see The Environment Editor) warms by one level. Storms may occur, depending upon the global precipitation likelihood. On subsequent turns, the warming trend will affect more extreme weather zones. If a map is too small to be zonal, or zone polarity is equatorial, the entire map will be affected as a one-time event.
- Cool Front: The most extreme weather zone (see The Environment Editor) cools by one level. Storms may occur, depending upon the global precipitation likelihood. On subsequent turns, the cooling trend will affect less extreme weather zones. If a map is too small to be zonal, or zone polarity is equatorial, the entire map will be affected as a one-time event.
- Force 1 or 2 wins instantly: Unless another event overrides this one, the indicated force wins at the end of the turn.
- End scenario with normal victory tally: Unless another event overrides this one, the scenario ends with a normal victory tally.
- News only: Other than placing a news string in the news display, this event has no direct effect. Other events may use this one as a trigger.
- Withdraw a unit: The indicated unit will be withdrawn beginning with the event activation.
- Force 1 or 2 is granted chemical weapons release. Subsequent attacks by the force's artillery and aircraft equipment are enhanced by chemical weapons.
- Force 1 or 2 is granted nuclear weapons release. The force may attempt a given number of nuclear attacks per turn with his long range air units.
- Force 1 or 2 replacement rates are multiplied by a given percentage (1% to 999%).
- Force 1 or 2 force supply stockpile level is increased by a given percentage.
- Force 1 or 2 force supply stockpile level is decreased by a given percentage.
- Activate Event: Use this to activate another event. This is most commonly used to use one complex event to trigger another.
- Cancel Event: Use this to cancel another event.
- Enable Event: All other events can only be activated once. You can use this effect to set a previously activated or triggered event to be eligible for another occurrence.
- Force 1 or 2 theater reconnaissance capability is set to a certain percentage.
- Force 1 or 2 guerrilla capability is set to a certain percentage.
- Force 1 or 2 air transport capacity is set to a certain level.
- Force 1 or 2 sealift capacity is set to a certain level.
- Force 1 or 2 rail transport capacity is set to a certain level.
- Withdraw an army: All units with exactly the same icon color scheme (foreground and background) as a selected unit will be withdrawn from the theater. This includes reinforcements not yet on the map.
- Force 1 or Force 2 shock level: This is typically used to model surprise. Shock levels can range from 1 to 200, but should in most cases be limited to the 50-150 range. Default is 100. Unit strengths are multiplied by the shock level (as a percentage). Movement costs for moving near enemy forces may be decreased if the moving force has a shock level greater than the non moving force, and costs may be increased if the moving force has a shock level less than the non moving force. Time expended in combat may be reduced if the attacker has a shock level above 100 and may be increased if the attacker has a shock level below 100. At levels below 100 formations may arbitrarily reorganize (becoming unavailable for your orders).
- Force 1 or Force 2 Rail Repair Capacity - This is the greatest number or rail locations that will automatically be repaired by the force in any given turn. This ability is in addition to any railroad repair engineering units.
- Force 1 or Force 2 Rail Destruction Chance - This is the chance that units of the force will destroy enemy rail lines when advancing into enemy controlled territory. Default is 100% (as hard coded in earlier versions of the game).
- Supply Radius 1 and Supply Radius 2 are used to set the road supply radius of force 1 or force 2. This is the distance to which roads extend the fully supplied net from supply sources or railroads leading to supply sources. The default is 4 hexes (as previously documented). Any value from 0 (full supply only available along rail lines and at supply sources) to 100 (full supply can run from supply points along rail lines and up to 100 hexes length along roads) can be set.
- Force 1 Air shock level and Force 2 Air shock level - As with the force shock level, this is used to model surprise or sudden drops of morale for air units. It is a direct percentage multiplier to air unit strengths. If the shock level is less than 70%, air units will not rise to defend their air bases (interception) when under attack. Default is 100%. The effect is permanent, so you need to remember to restore to 100% when you want the surprise effect to expire. This also affects unit quality checks, so be careful with it.
- Cease Fire and Open Fire. When a cease fire is in effect units may not enter enemy territory or attack enemy units, there is no interdiction or air superiority combat and air units will not intercept enemy units using air movement. Once called, a cease fire is permanent. To cancel a cease fire, issue an open fire event effect.
- Supply Point 1: Place or remove a force 1 supply point.
- Supply Point 2: Place or remove a force 2 supply point.
- Form'n orders: Set formation orders and emphasis. Only orders and emphasis can be modified. Objective tracks are

unaffected.

- Remove zone 1: Remove exclusion zone 1.
- Remove zone 2: Remove exclusion zone 2.
- Strategic bias 1: Set P.O. force 1 strategic bias.
- Strategic bias 2: Set P.O. force 2 strategic bias.
- Set ownership 1: Set ownership of a location to force 1. No effect if location is occupied.
- Set ownership 2: Set ownership of a location to force 2. No effect if location is occupied.
- Variable +: Adds a value to the event engine variable.
- Variable -: Subtracts a value from the event engine variable.
- Theater Option 1: Places a theater option in the force 1 strategic option dialog.
- Theater Option 2: Places a theater option in the force 2 strategic option dialog.
- Force 1 Track: Switch programmed opponent objective tracks for force 1.
- Force 2 Track: Switch programmed opponent objective tracks for force 2.
- Disband unit: Similar to withdraw unit, but disbands unit with equipment entering the replacement pool. The unit need not be on the map to be disbanded. This can be used to dump an equipment bolus into the replacement pool.
- PO 1 Activate: Activate an event if force 1 is controlled by the programmed opponent.
- PO 2 Activate: Activate an event if force 2 is controlled by the programmed opponent.

An event can have a value: Depending upon context, the value can be a trigger (the victory differential necessary to trigger a player winning triggered event) or an effect value (the victory award for an increase victory level effect event).

An event can have a radius: Depending upon context, the radius can control either the trigger (as in the case of an occupation-triggered event) or the effect (as in the case of a refugee effect event).

Withdraw unit events require a unit specification.

The Event Engine Variable

The event engine variable is used to track some scenario dependent value. You can add to it or subtract from it by event effects (see below). The value can't go lower than 0, so if you have any doubt about the level the variable may have and you want to be sure to set it to zero, just subtract some large value from the variable.

Theater Options

You can use theater option effects to give players control over specific events. The news string for the option will show up in the theater option dialog next to the option button, not in the recent news dialog. When a player selects an option, it is converted into a timed event (timer trigger) for activation in the current turn. The option is then removed from the player's option list. . If you wish to remove an option, place a second option with _exactly_ the same news string and an "event to activate" of 500.

Using the Event Editor to Create an Event List

The Event Editor shows three events at a time, in separate panes. Below the event panes is a control bar with event list scroll buttons, sorting buttons, and an exit event editor button.

Event Editor Control Buttons

- Scroll Buttons – Use this to scroll through the event list.
- Sort Buttons – Use this to sort events by turn, trigger, or effect.
- Exit Button – Use this to exit the Event Editor.

Event Panes

Each event pane has up to nine buttons, as well as a news string entry field immediately below the buttons. Click within the news string entry field to change the string to be displayed in the Recent News report if the event is activated. You do not have to specify a news string, and in some cases you will want to leave the news string blank. Many events do not use all nine buttons, and buttons will only appear as needed. Different buttons can have different meanings in different event types. Watch the context prompt in the event editor information panel for further explanation.

From left to right, top to bottom, the buttons are:

- Trigger: Use the trigger button to set the trigger type. Left clicking increments to the next trigger. Right clicking results in a popup menu from which you can select the trigger. It is usually more efficient to use the popup menu to select the trigger type.
- Effect: Use the effect button to select the effect type. Left clicking increments to the next effect. Right clicking results in a popup menu from which you can select the effect type. It is usually more efficient to use the popup menu to select the event type.
- Triggering Event: Use the triggering event button to choose the event to use for a trigger for the current event. This is only used if you are setting up an event triggered by another event.
- Turn or Delay: Use the turn or delay button to set the turn of occurence
- Turn Range: Use the turn range button to set the range of turns over which an event may occur.
- Chance of Occurrence: Use the chance of occurrence button to set the chance that the event will occur if the trigger condition is met.
- Location x: Use the location x button to set the x map coordinate of the affected or checked location.
- Location y: Use the location y button to set the y map coordinate of the affected or checked location.
- Value, Radius, Affected Event, or Unit Name: Use this button to select the item indicated by the context prompt in the information panel.

The New Scenario Event Template

When you first open the event editor for a new scenario you will find several standard ‘‘blank’’ events ready to be filled in. The first of these is a Turn 1 news event. You can fill in the news string to create the first news item you want to appear in the Recent News report when the scenario begins. Below this are blank turn 1 events for setting the air, sea and rail transport and global reconnaissance levels for each force. In most cases you will want to leave the sea and air transport levels at 0, but there should almost always be some rail transport or global reconnaissance level for each force. To calculate the amount of transport needed, determine how many units you wish to be able to move. In a truly historical scenario, this will be based on the actual maximum levels used by each force in the original campaign. Add up the transport requirements available in the Deployment Editor Unit Reports. For example, if your research indicates that a force apparently had the ability to ship three regiments per turn by rail, and the transport requirement of three typical regiments adds up to 150, set the force rail transport capacity to 150. Do the same for air and sea transport capacities if you want to be able to move units by air or sea in your scenario.

Default Events

When a named urban location is taken or successfully defended the program automatically places a news item in the Recent News report. You do not need to set up separate events solely to report these occurrences.

The Replacement Editor

You set the rate of replacement for each type of equipment in the inventory of each force using the replacement editor.

This dialog is very similar to the Inventory and Replacements Report available in the game. It lists the complete equipment inventory for a given force, indicated by the national flag near the control panel. The control bar at the bottom of the dialog has four buttons: Scroll up, scroll down, exit, and switch sides. The scroll buttons are used to scroll the inventory. Click on the exit button to leave the replacement editor. The switch sides button is used to toggle from one force inventory to the other.

Each item in the inventory has an information button, name, on hand quantity, replacement rate, begin and end buttons, and an assigned equipment tally.

- Information Button: Click here for equipment information.
- Name: This is the name of the equipment type.
- On Hand Button: This is the quantity of replacement equipment currently stockpiled and available for distribution to understrength units.
- Replacement Rate Button: This is the rate at which the equipment is added to the "on hand" stockpile of replacements. In most cases, this should be woefully short of requirements.
- Begin Button: This is the first turn in which the equipment will be added to the stockpile.
- End Button: This is the last turn in which the equipment will be added to the stockpile.
- Assigned equipment tally: This is the total quantity of equipment assigned to all units defined in the force order of battle. The total includes units that may, depending upon scenario design, never actually enter the map.

Default Replacements

If you choose, you can set 1% or 2% replacements from the Edit / Set Replacements Menu item. If you do this, 1% or 2% of your total starting force inventory of each item will be replaced each turn.

Equipment Transitions

You can model equipment transitions by using the begin and end buttons to set the arrival time frames for different types of equipment. If you authorize different types of equipment in your units while assigning different starting levels you will find that the unit slowly transitions from one type of equipment to another as the types of replacements available change over time. Since it is possible to authorize equipment without actually assigning it, a unit could conceivably go from being equipped solely with one type of equipment at the beginning of a scenario, to being equipped solely with another type of equipment by the end of the scenario. Sudden transitions can be achieved by withdrawing a unit and entering another unit of the same name but different equipment as a replacement at a later date.

Unit Replacement Priorities

You can use the Specific Unit Replacement Priorities Dialog to set unit replacement priorities and eligibility for reconstitution. The unit list can be scrolled up and down, and the switch sides button switches from one force to the other. All units are displayed, along with their formation assignments, replacement priority, and reconstitution eligibility. Select a replacement priority button to change the associated unit's replacement priority. Select a reconstitution button to toggle the unit's eligibility for reconstitution.

Replacement priorities affect the likelihood and amounts of replacements for units if there isn't enough replacement equipment to fill all requests.

Replacement Priority	Relative Priority
Very High	100%
High	80%
Normal	60%
Low	40%
Very Low	20%
None	0

Units with a replacement priority of none will never receive replacements during a scenario. Units ineligible for reconstitution will not be reconstituted if destroyed during a scenario. If you use this dialog to set unit replacement priorities or eligibility for reconstitution you should probably mention the fact in your scenario briefing, otherwise players may be confused when their units do not receive replacements or are not reconstituted.

The Deployment Editor

The deployment editor is used to deploy forces on the map; set supply points, reinforcement entry sites, and plot programmed opponent orders and objectives. The main displays in the deployment editor are very similar to those used in the game.

The Deployment Editor Control Panel

The nine buttons in the control panel are previous unit, next unit, previous formation, next formation, undo, current formation info, orders scope, switch sides, and deployment mode select.

- Previous Unit: Select the previous unit.
- Next Unit: Select the next unit.
- Unit Icon Display – Changes the unit icon display preferences. This selects between showing unit strengths or movement allowances.
- Undo: Undo the previous action.
- Previous Formation: Select the previous formation and its first unit.
- Next Formation: Select the next formation, and its first unit.
- Current Formation Info: Display a full report on the current formation.
- Switch Sides: Switch from one force to the other.
- Deployment Mode Select: The deployment mode select is used to specify the action to be performed if you select a location in the map panel.

The Deployment Mode

You place units, supply points, etc. by right clicking in the map panel. The effects of a right click depend on the deployment mode. The deployment mode is selected by clicking on the deployment mode button:

- Place Unit: The current unit, if off map, will be placed in the selected location. If you right click on the current unit, a popup context menu will give you a choice of actions.
- Remove Unit: The top unit (and possibly others) in the selected location will be removed from the map.
- Place Supply: If no supply point is in the location, one will be placed. If a supply point is already present it will be removed.
- Place Objective: If no current formation objective is in the location, one will be placed. If you click on an existing objective while placing objectives in the deployment editor you are offered three choices. Remove objective removes the objective from the map, Insert objective renumbers all objectives to allow placement of a new objective within an existing objective path, and Compress objectives removes any "holes" in the formation's objective path.
- Objective Value: You can set the value for any final objective in the location.
- Toggle Ownership: You can change the ownership of an unoccupied location.
- Reentry Point: You can use this to set a re-entry point for reconstituted land units. Each side may have one reentry point defined. It is not necessary for a reentry point to be set for each force, but if it is set all reconstituted land units belonging to the force will enter at the reentry point as long as it is friendly controlled.

The Formation Report

This dialog is almost identical to the one used in the game. The primary difference is the presence of formation orders and emphasis buttons, used to define the behavior of the formation when it is under computer control. You will have to use these buttons to set the orders and loss tolerance for your formations.

Formation Orders

Formation orders are primarily designed for use in fine tuning the programmed opponent. Except for the Static and Delay orders, they have no effect on a human player.

- Defend: The formation will defend its objectives, with higher priority given to higher numbered objectives. As long as all objectives are under friendly control, most units will remain in place. If all objectives are under friendly control, but some are threatened, some units will migrate in a high efficiency / safe / low speed mode toward the most threatened objective. Movement will generally be along the line of intermediate objectives, if any. If any objective becomes enemy controlled, the formation orders automatically switch to attack orders and follow attack order logic. If allowed, units belonging to the formation will attempt to dig in. Formations with defend orders will remain more concentrated than formations with screen orders.
- Attack: The formation will advance toward the highest numbered enemy controlled objective. Once all formation objectives are friendly controlled, the formation switches to defend orders and follows defend order logic. Formations with attack orders will remain more concentrated than formations with secure orders.
- Secure: This is similar to an attack order. The only difference is that a formation with a secure order switches over to a screen order (rather than defend) when all formation objectives are under friendly control.
- Screen: Units belonging to a formation with a screen order will divide, split up and attempt to bring all nearby territory under friendly control. They will fall back to the highest numbered objective if strongly approached by the enemy. If any formation objective becomes enemy controlled, the formation switches to a secure order.
- Static (was Reserve): Units belonging to the formation are not available for orders until the formation is activated. Activation occurs on a specific turn (set in the editor) or when the enemy attacks or moves adjacent to any unit of the formation. When activated, the formation assumes a defend order.
- Delay: Units belonging to the formation are not available for orders until the formation is activated. Activation occurs on a specific turn (set in the editor) or when the enemy attacks or moves adjacent to any unit of the formation. When activated, the formation assumes an attack order.
- Wait: Affects the programmed opponent as a delay order. There is no effect on a human player.
- Hold: Affects the programmed opponent as a static order. There is no effect on a human player.
- Fixed: The "fixed" formation order is identical to the "hold" formation order except for one thing - the formation can *only* be activated by either an event or turn. Enemy actions will not activate the formation. This order is intended for formations in static or fortified positions, where the scenario designer wished to force the formation to remain in place regardless of enemy action. This order has no effect on a human player.
- Independent: Units belonging to the formation will attempt to do what they do best, in support of other formations along the axis running from lowest numbered objective to highest numbered objective. This is a ‘‘catch all’’ order, intended primarily for very high level formations.
- Advance. This order has no effect on a human player. The PO effect is similar to the attack order, except that the formation will ignore threats to its rear areas. The formation will only react to rear area threats if all formation objectives become enemy controlled.
- Garrison:This order affects both human and computer players. Garrison orders are very similar to reserve orders, except that units are individually activated if pushed out of their original positions. The order is converted to a defend order when the game is first loaded, and all units of the formation assume a garrison status. Units in garrison are treated much like units in reserve formations. Individual units lose their garrison status when they are retreated or eliminated. Once a unit loses its garrison status, it may be used normally. Garrison units are shown with a yellow band across the bottom of their 2d unit icon.

Formation Loss Tolerance

Formation loss tolerances have much the same effect as unit loss tolerances have in the game. Formations ordered minimize losses will behave cautiously under programmed opponent control. Formations ordered to ignore losses will behave very aggressively under programmed opponent control.

Formation Objectives

Each formation may have up to nine objectives. Formations will attempt to advance up the line of objectives from the lowest numbered objective to the highest numbered objective when on the offensive. They will fall back in the opposite direction when defending. At least one objective must be set for the formation in order for units to be assigned as reinforcements.

Deployment for airborne ops

The programmed opponent is much more likely to use airborne units in airborne attacks if you deploy the units in locations with airbases. Remember to give the force enough air transport capacity to transport all the units you want involved.

Deployment for amphibious ops

The programmed opponent is much more likely to use units for amphibious operations if you deploy the units in a friendly anchorage, with the lowest numbered objective reachable only by sea transport. Remember to give the force enough sea transport capacity to transport all the units you want involved in any invasions.

How to Deploy Your Forces

Undeployed units may be deployed by placing them on the map, or by assigning them as reinforcements. You will only be able to deploy units in allowed locations.

It is probably best to set up territorial ownership before deploying your units. The quickest way to do this is to temporarily deploy a few units from each force within the territory to be controlled by the force at the beginning of the scenario. Select the "place unit" deployment mode. Move the mouse cursor into the map view and right click to deploy a unit. Place a few more units in the same way to outline the territory owned by that force. Now select switch sides to the opposing force by clicking on the switch sides button and deploy a few units from the second force. Once the rough outlines of the territories are outlined, select the Edit Automatic Ownership menu item to calculate terrain ownership over the entire map. It is best to place at least half a dozen units per side since the ownership calculation takes more time if units are sparsely placed. Select the Edit Remove All Units menu item to pick up the temporarily deployed units. Select View Flags: Visible or View Flags: Borders so you can see the boundaries between the forces. If you need to fine tune the territorial ownership select the "toggle ownership" deployment mode and click on the locations you wish to change from ownership by one force to the other.

Once you have your borders defined, it is time to start placing your forces on the map. Select the "place unit" deployment mode. Move the mouse cursor back into the map view and begin placing units by right clicking on map locations. As you place units, the editor will keep cycling to the next undeployed unit. Once you have placed all the units you wish on the map, the remainder can be set as reinforcements.

You can divide units in the deployment editor. Be cautious about this. Once units are divided they can't be modified in the force editor. Try to avoid dividing units in the deployment editor until after you are certain that there will be no more significant changes to your order of battle.

Setting Reinforcements

In order to set reinforcements you will have to assign at least one objective for the units' parent formation. Select the "place objective" deployment mode and right click within the map view. The selected location will become the default entry point for an reinforcements assigned to the formation. Click on the current formation button in the control panel to bring up the formation report. Notice that all undeployed units assigned to the formation are scheduled to appear on the first turn, at the location selected for the first formation objective. You can change the entry turn or entry (appearance) location by clicking on the corresponding buttons next to the unit name.

Placing Supply Sources

Once all reinforcements are set, you need to place supply sources. Select the "place supply" deployment mode. Click within the map view to place supply points for the current force. Switch sides to place the other force's supply points.

Set Formation Orders

Finally, set all formation orders and objectives. Set formation orders and orders emphasis using the buttons at the bottom of the formation report.

Place Formation Objectives

Select the "place objective" deployment mode. Set objectives for the current formation by right clicking within the map view. If you wish to remove an objective, click again. Objectives for the current formation are shown as numbers in the map and microview panels. If a location has an objective for any formation of either force it is shown as a national flag indicating the current owner of the location. Note that only objectives that are given a positive victory point value will be visible when you play the game.

If you click on an existing objective while placing objectives in the deployment editor you are offered three choices.

- Remove objective: removes the objective from the map.
- Insert objective: renumbers all objectives to allow placement of a new objective within an existing objective path.
- Compress objectives: removes any "holes" in the formation's objective path.

Set the Microview Icon Colors and 3d Icon Tints

One of the last things you need to do when designing a scenario is decide which sides should be represented by which colors in the microview and in the 3d map displays. Use the Edit Set Microview Icons menu item to set microview icon colors, and the Edit Set 3d Icon Tint menu item to set 3d icon colors.

The Scenario Briefing

This shows up when the scenario is selected in the scenario select dialog as well as within the game from the scenario briefing display. You have 8k of text space. You should try to include the following in your scenario briefings:

- Physical description- Scale, Climate, Map Size.
- History- Date, Location, General Context. Keep this fairly short, or make sure that there is a concise introductory paragraph.
- Basic mission guidelines for players- Let them know what they need to try to do to win the game.
- Formation support level effects- Be sure to let players know if you have used the formation support scope feature to impose restrictions on force cooperation.
- Special features / events- Hilight possible strong event features, such as Jordanian or Soviet intervention in Middle East 73. This really is a critical point. You will confuse the hell out of players with things like guerilla and theater reconnaissance effects if you don't mention them in the scenario description.

Victory Briefings

Consequences and Speculation- Players will see one of three results texts at the end of a scenario, depending upon the winning force. This text should give the player a sense of the consequences of the game result, including a reference to the historical result.

The Briefing Editor

The included briefing editor dialog is a simple Windows text editor. It can be used to create briefings, but if really want to do a professional job (spell checking, etc.) you might wish to create your briefings in a full functioned word processor. Once you are satisfied with the briefing, just cut it from your word processor and paste it into the briefing editor dialog.

Use the Scenario Dump Feature

Scenario dumps are an invaluable aid in scenario design. A tremendous amount of information is available in the scenario dump. Among other things, the dump includes the results of the scenario validation check as a list of warnings and suggestions. In order to load into the game without warnings, your scenario must pass this scenario validation check.

Talk to other scenario designers

This editor is only going to become more complex as the game develops If you don't understand something, or if you can't figure out how to model some event, check with other scenario designers. The TalonSoft web site will include links to resources (web sites and email addresses) for scenario designers, including collections of user created scenarios as they are developed.

Study dumps of the existing scenarios

Load some of the standard scenarios and use the scenario dump feature to create text dumps. Studying these dumps will give some idea of the level of situation detail possible in TOA. If you decide to print a scenario dump out, you might wish to reformat it in a word processing program. It is not uncommon for scenario dumps to run over 150 printed pages with the usual printer defaults. Scenario dumps are also a critical aid in developing your own scenarios, particularly if you make heavy use of reinforcements or the event engine.

The Event Engine

You can go nuts with this thing, but be cautious. We opted for power over bulletproofing. If you are working on a short, straightforward scenario you may not need to worry about the event list at all. Default news items will be generated when significant battles are fought or named cities are taken or ruined. On the other hand, if your scenario is longer than a couple of months – particularly if weather is important – expect to get your frontal lobes dirty.

Regardless of whether you wish to be creative with the event engine, there are a few standard events that should be set for most scenarios. Be sure to set theater recon, theater guerilla, rail transport, sea transport, and air transport levels for each force. Set this up as a simple timer trigger for turn 1. Remember to modify the values with later events if they should be changed. Theater recon abstractly represents your long range and ‘‘humint’’ resources. A value of 10% is probably sufficient for most cases, perhaps higher in smaller physical scales. Theater guerilla levels represent things like partisan activity. Set this level if you want locations behind friendly lines to have a chance to spontaneously revert to enemy control.

Make it Fit

Think about the games you have played. Do you remember any that didn't work because the unit scale or density were wrong? I do. This is a subjective judgment, and there are special cases. But try to avoid huge, sparsely populated maps. You should also try to avoid maps clogged with large groups of units unless you want to give players a case of virtual trench foot. Some situations are too large, and some are too small, to fit well with this game system. TOAW is designed to handle classic mechanized campaigns. Do not attempt explicit naval campaigns. Naval combat is weakly modeled. If you really need to handle naval campaigns, resolve them using the event engine and a series of dependent reinforcement or withdrawal events.

Maps

In some cases you will have to simplify things like road networks. When you do, try to keep the programmed opponent code in mind. The pathfinding algorithms are pretty good, but they will have an easier time of "looking smart" if you don't go out of your way to design crooked roads or railroads with lots of switchbacks. Blow bridges in the map editor if necessary.

Unit Deployments and Air Unit Missions

When you get around to final polish on your scenarios be sure to give reasonable starting missions for air units. Remember that if air units are "resting" they will not respond to enemy air action. (Actually, you can use this to model surprise to some extent, although the units will still rise to their own defense if their base is attacked.) No player wants to cycle through 20 air units putting all the fighters on air superiority and all the bombers on interdiction at the start of every scenario. Put land units in defensive positions or reserve deployments. Set appropriate loss tolerances for all units.

Forces

The force you set as the first force on turn 1moves first on turn 1 only (except in PBEM games). All bets are off after that, with initiative set according to the relative strengths and positions of the opposing forces. Few scenarios should have force supply stockpile levels above 25%. Play with it. If your units should be experiencing supply problems but are not, you should to experiment with lower force stockpile levels or formation supply distribution efficiencies.

General Organization

You have 32 unit slots in each formation. Please do not use them all. Open slots must exist for units to break down. If you fill up your formation unit list the units of the formation will not be able to break down. If possible, try to limit the number of line combat units (things like infantry regiments) in a formation to no more than 12; any more and the programmed opponent code will not use all of the units efficiently in some situations. You may actually want this effect in some situations. Overloaded formations may tend to use Soviet style echelon attacks.

Sample Force, Formation, and Unit Characteristics Settings

Formation and Unit Characteristics

Nationality	Formation Proficiency	Formation Supply Distribution Efficiency	Unit Proficiency
Argentina 1980's	60	70	60
China 1956-1978	60	60	60
China 1979-2000	70	70	70
France 1950's	70	80	75
France 1960-1970	80	90	85
France 1971-2000	90	100	90
Germany (East) 1956-1965	70	70	65
Germany (East) 1966-1990	80	80	75
Germany (West) 1956-1965	80	80	70
Germany (West) 1966-1975	85	90	80
Germany (West) 1976-1990	90	100	90
Germany 1990-2000	90	100	95
Iran 1970's	60	80	65
Iran 1980-2000	50	70	60
Iraq 1980-1991	50	70	50
Iraq 1992-2000	40	60	40
Japan 1956-1970	75	90	70
Japan 1970-2000	90	100	80
Russia 1991-1994	65	70	60
Russia 1995-2000	60	65	50
Soviet Union 1956-1970	65	70	70
Soviet Union 1971-1990	70	75	75
Taiwan 1956-1965	70	90	70
Taiwan 1966-2000	80	100	80
United Kingdom 1956-2000	90	100	90
United States 1956-1964	80	100	80
United States 1965-1968	80	100	70
United States 1969-1980	85	100	80
United States 1980-1995	90	100	90
United States 1996-2000	85	100	85
Vietnam (North) 1956-1960	60	50	60
Vietnam (North) 1961-1973	70	60	70
Vietnam 1973-2000	75	60	70

Force Characteristics

Nationality	Force Proficiency	Force Supply Stockpile	Guided Weapons Level	Refueling Multiplier	NBC Proficiency	Night Combat	Electronic Support
Argentina 1980's	55	15	0	1	25	33	15
China 1956-1978	55	20	0	1	25	40	15
China 1979-2000	65	30	0	1	50	40	30
France 1950's	70	25	0	1	25	33	33

France 1960-1970	80	30	0	1	35	40	40
France 1971-2000	85	35	15	1	70	40	50
Germany (East) 1956-1965	60	25	0	1	50	33	33
Germany (East) 1966-1990	70	30	0	1	70	40	40
Germany (West) 1956-1965	65	25	0	1	25	33	20
Germany (West) 1966-1975	75	35	0	1	40	40	33
Germany (West) 1976-1990	85	40	10	1	75	50	40
Germany 1990-2000	90	40	30	1	70	50	50
Iran 1970's	60	20	0	1	25	33	25
Iran 1980-2000	55	15	0	1	25	33	20
Iraq 1980-1991	45	15	0	1	50	33	25
Iraq 1992-2000	35	10	0	1	50	33	15
Japan 1956-1970	65	25	0	1	25	40	33
Japan 1970-2000	75	35	15	1	50	50	40
Russia 1991-1994	55	25	10	1	90	40	33
Russia 1995-2000	45	15	10	1	75	33	30
Soviet Union 1956-1970	65	30	0	1	75	33	33
Soviet Union 1971-1990	70	35	10	1	100	40	40
Taiwan 1956-1965	65	30	0	1	25	33	25
Taiwan 1966-2000	75	35	0	1	50	33	40
United Kingdom 1956-1979	85	35	0	1	50	40	33
United Kingdom 1980-2000	85	35	0	2	75	50	50
United States 1956-1964	65	30	0	1	25	33	25
United States 1965-1968	75	35	0	2	25	33	33
United States 1969-1980	75	30	10	3	40	40	50
United States 1980-1995	85	40	30	3	75	50	60
United States 1996-2000	85	30	50	3	75	50	70
Vietnam (North) 1956-1960	55	20	0	1	0	40	10
Vietnam (North) 1961-1973	55	25	0	1	0	50	20
Vietnam 1973-2000	65	20	0	1	25	40	20

Notes:

These suggestions are for typical front line units. Elite units should have generally higher values, and second line units should have lower values.Unit supply levels are situation dependent. As a general rule of thumb, you might wish to set the unit supply levels similar to the force supply stockpile levels. But in most cases campaigns occur after periods of relative quiet. Except for those recently involved in combat, most units should start at levels very near 100% in most scenarios. This is particularly true of the attacking force, which would usually have stockpiled supplies in units prior to launching an offensive. Even units belonging to a force with a low force supply stockpile level might have 100+ unit supply levels at the start of a scenario. Remember the effects of theater transport capacities on supply distribution. If you have heavily motorized forces, or if you have very large transport capacities, you may need to drop your force supply stockpile levels a bit. Check the effective supply levels using the Situation Briefing in the game after you have designed your scenario. In general, forces should not have effective supply levels above 50%; otherwise all units will tend to recover very rapidly from operations.Commonwealth unit characteristics should be similar to United Kingdom characteristics.

Support Levels

This is a *critical* game feature, so information available elsewhere in this manual bears repeating here. You can set a formation support level to Internal Support, Army Support, Force Support, or Free Support. The degree of cooperation is based on the best possible cooperation level between two units.

Internal Support

Units belonging to formations with internal support levels will only cooperate fully with other units of the same formation. Limited cooperation is possible with units belonging to other formations, as long as those units use exactly the same 2d icon color scheme. No cooperation is possible with other units.

Army Support

In this context the term ‘‘army’’ means units with identical 2d icon colors. Units belonging to formations with army support levels will cooperate fully with other units of the same formation, as well as those using an identical 2d icon color scheme and belonging to other formations. Limited cooperation is possible with units of other formations using the same 2d icon background color and a different foreground (symbol) color. No cooperation is possible with other units.

Force Support

In this context the term “force” means units with similar 2d icon background colors. Units belonging to formations with army support levels will cooperate fully with other units of the same formation, as well as those using the same 2d icon background color and belonging to other formations. Limited cooperation is possible all other units.

Free Support

Units belonging to formations with free support cooperate fully with all friendly units. This should generally be used only for very high level formations.

Intermediate objectives

The programmed opponent will do a pretty good job of finding a path from a formation's current location to its objectives. There may be times, however, when you wish to fine tune the likely path that a formation will take from one point to another. This is particularly true if the terrain in your scenario has a strong channelizing effect on movement. You may find that in this case many formations will jam up at low movement cost choke points. If this happens you might wish to set intermediate objectives to guide some or all formations through specific points. It can also be helpful to specify intermediate objectives at places like bridges if the terrain is difficult. This may simplify the programmed opponent's task in finding "good" paths.

Intermediate objectives can also be used to set up reserve reaction situations. By setting an objective to some otherwise unimportant location you can trigger an attack by the affected formation when the enemy force passes through the "tripwire" objective. In some cases this is a matter of timing. You can, for example, set up a likely meeting engagement by setting a zero value tripwire objective on a road just before the objective you actually wish to protect. Your formation will react, advancing through the actual objective on its way to the front as soon as the enemy hits the tripwire.

Values and victory

It is only possible to assign victory point values to objectives assigned to formations. This should keep you from forgetting to assign someone to guard or seize an important victory point objective. You should still be careful in assigning objectives and victory values though. The programmed opponent logic is strongly formation based. Within certain limits, the internal movement logic will ignore valued objectives not specifically assigned to a particular formation. Be sure to assign sufficient forces to secure valuable objectives.

Victory in the game is based on the values you assign to your objectives. Loss penalties are scaled to be equal to total objective values. Total loss of both forces will result in loss penalties exactly equal to the value of all objectives on the map.

Multiple Objective Tracks

You can set up as many as three different sets of objectives for each formation. Only the values assigned to objectives in track one have any victory effect. If you use this feature be sure to set up multiple objective tracks for all formations, otherwise the programmed opponent may become confused if you select alternate objective tracks. Use a Force Track event to switch tracks during a scenario.

This is a very advanced feature. It imposes significant additional testing requirements on your scenario. Do not feel that you must use it. Most of the official scenarios only use track 1 objectives.

Authorized and assigned equipment

In many cases you should consider assigning your units less than their authorized equipment strengths, particularly if your scenario is not set at the very beginning of a conflict. In some rare cases, units can begin with more than their authorized equipment level.

Untried vs. Veteran Status

You can set your units to veteran status, fixing their proficiency, by use of the veteran / untried toggle button in the unit report. This can have a strong effect on how your scenario will play. Most units should be veterans in mid-war scenarios. Many units should be untried in scenarios beginning major campaigns. Newly raised units arriving as reinforcements should generally be untried (the default).

Supply levels

It is common for one or both sides to have very large stockpiles of supplies available for their units in the opening hours or days of a war. You should consider this if your scenario is set at the beginning of a war. I do not recommend oversupplying forces in mid conflict scenarios. Be aware that an oversupplied unit's supply level will immediately drop to 100% or less if it moves.

Deployment status

If the situation modeled in your scenario calls for units in defensive positions be sure to remember to set the units to defending, entrenched, or fortified deployment status. Remember to set a local or tactical reserve order for any units that historically reacted to enemy movements. This could be critical for some scenarios where the attacker will move before the defender gets a chance to set his unit deployments.

Headquarters Units

Depending upon the effect you are trying to achieve headquarters units can either be simple formation focal points and holding units for assets typically attached to larger formations (as was typical in TOAW I), or they can be carefully modeled providers of command and supply for units in their formation. Some armies have very informal decentralized command and supply systems. Others are arranged in rigid formal hierarchies. You can see this difference in the Middle East 1973 scenario; where the Israelis do not even have HQ units and the Arabs have very formal HQ units. This is an advantage for the Israelis, as they are not subject to the negative effects of damage to HQ units.

Command Groups

Command Groups provide command functions for a formation. Headquarter units do not need to have command groups authorized, but if they do, their formations are likely to be forced to reorganize if all assigned command groups in the headquarters are eliminated. In game terms, use of command groups allows a scenario designer to build a vulnerability into a force's formations. We recommend taking advantage of this feature, so go ahead and assign 2 command groups (this will probably work better than one unless you really want your command structure to be fragile) to each HQ unit.

Support Squads

Support Squads provide supply distribution functions for a formation. Headquarters units do not need to have support squads authorized, but if they do, units of the associated formation will suffer reduced re-supply rates should some or all authorized support squads be eliminated. In game terms, use of support squads allows a scenario designer to build vulnerability into a force's formation supply distribution efficiency

Whenever the game checks formation supply distribution efficiency (usually when supplying units) it looks to see if the formation has an HQ unit assigned. If no HQ is assigned, or the assigned HQ has not been eliminated and either never had support squad equipment authorized or still has its full compliment of support squads assigned, the usual formation supply distribution efficiency is used. If an assigned HQ has been destroyed, or if fewer than half of the authorized support squads are assigned, the formation supply distribution efficiency is 50% of its "best" level (the one you set in the editor). At support squad levels between 50% and 100% of authorized, the formation supply distribution efficiency is tied to the fraction of assigned / authorized support squads. If you don't want these effects, don't assign support squads to your HQ units. We strongly recommend against using support squads in HQ units below regimental level.

How many support squads should you put in an HQ? The number is tied to the size of the formation:

HQ size symbol	Support Squads for 100% supply distribution efficiency
SECTION	1
PLATOON	1
COMPANY	3
BATTALION	5
REGIMENT	15
BRIGADE	20
DIVISION	40
CORPS	80
ARMY	120

Do you need to remember these numbers? No. Just assign any number of support squads to your HQ units. When you set the formation supply distribution efficiency for the formation (including use of the global change functions in the editor) the editor will automatically recalculate the proper number of support squads for all HQ units affected by the change. Note that since the supply level is tied to the number of support squads assigned, there may be slight rounding errors; particularly in brigade and lower level headquarters.

Protecting Headquarters Units

With the increased importance of HQ units using command groups or support squads you really need to be sure to include things like division anti-aircraft equipment in your orders of battle, otherwise your formations will be very vulnerable to enemy air attacks.

Unit type symbols

Some, but not all, unit icon type symbols carry with them special capabilities. In some cases, special equipment variants or modifications are implied. Use these symbols carefully. Symbols are listed by name in the Unit Types appendix below.

Guerrilla Units

You should use guerrilla units only in scenarios where guerrillas have a historical reputation for special capabilities beyond those of light infantry. Inmun-Gun and some Viet Cong units come to mind. In many cases it is more appropriate to use the "irregular" unit type to simulate simple armed mobs. It is recommended that the guerrilla event engine effect be used in conjunction with guerrilla units in order to maximize enemy player confusion.

Unit Standard Icon Colors

Icon colors are significant. Remember that each degree of separation you select in your icon color schemes will add a degree of separation in unit cooperation. Maximum cooperation is possible between units with identical icon color schemes. Less cooperation is available between icons with similar background colors and different foreground (symbol) colors. Very little cooperation is possible between units with icon different base colors.

Replacements

In many cases you can get away with one of the default replacement settings, either 1% or 2%. See the Edit / Replacements menu item. The default settings will provide reasonable, if uninspired replacements beginning on the first turn and running through the end of the scenario.

Equipment Transitions

In long scenarios you might wish to model equipment transitions. You have 24 slots for equipment in each unit – generally more than enough. Reserve two or three slots for equipment to be received by the unit at different times.

Event Replacement Multiplier Effects

If a major belligerent enters the fray during a scenario you should probably use the event engine to increase the gaining force's replacements at the point of entry.

Supply Points

A supply point should be placed for any location that has the ability to supply a large portion of a force. In long campaigns, this generally means the point through which supplies arrive in theater. In shorter scenarios, supply points can represent local stockpiles. If you want supplies to flow in through an anchorage, you need to put a supply point there. Supply points are placed for each player. One player's supply point will not supply the other player. If you want a single location to be able to supply either player, you should place one point for each player in the location.

Differing supply levels: forces vs. formations vs. units.

Remember, units have organic supply levels reflecting actual beans, bullets, etc. These levels should frequently be set high at the beginnings of wars to reflect oversupply conditions common in attacking forces at the beginnings of wars. For mid conflict campaigns, try not to set them above 100% since oversupply really is intended to reflect the kind of forward stockpiling that is difficult to achieve once the fighting begins. The formation supply distribution efficiency is actually a measure of the formation's ability as an organization to distribute any available supplies from the force stockpile to units in their command. It does not represent a stockpile. Finally, the force stockpile is intended to represent the global availability of supplies for one side. It represents actual stockpiles, production capability, outside aid, etc. It is possible to have a very large force stockpile while individual units starve because of a poor supply distribution system, reflected by poor formation supply distribution efficiencies.

- Consider the story of the quartermaster at Isandlwana (1879). As legend has it, the British troops had plenty of ammunition available, but the quartermaster refused to distribute it more rapidly than the official rate of replacement for British troops in the field. Good force supply stockpile. Poor formation supply distribution efficiency. Initially good unit supply levels.
- Imperial Japanese forces in the Pacific had to account for every round fired from the very beginning of the Pacific war. Pilots could receive a reprimand if commanders decided they had expended too much ammunition during a mission. Poor force supply stockpile. Moderate formation supply distribution efficiencies. Initially moderate unit supply levels.
- Over the last half century an intermittent controversy has flared from time to time over the issue of "tail to teeth" in combat units. Western units have traditionally had very large support services relative to communist units. In theory (and generally in practice) this has meant that western units could re-supply from force stockpiles much more rapidly than their opponents.

Transport asset sharing.

Don't ignore the "boring" equipment assigned to units. Excess trucks and horse teams may not have an effect on a unit's movement capability, but they can have a very strong effect on supply distribution. U.S. forces, in particular, are well known for their practice of temporarily stripping transport assets from units that don't need them and forming ad-hoc "Redball Express" units to aid in rapid re-supply. This is modeled in the game as "transport asset sharing". On the other hand, remember that some forces (particularly "third world" countries) should be chronically understrength in transport assets.

Event Supply Modifier Effects

Even in simple scenarios you may wish to modify force supply stockpile levels.

Scenario Briefing Illustration

If you place a bitmap (a standard windows BMP file) with the same name as your scenario file in the graphics directory, your bitmap image will show up in the scenario briefing screen during game loads and when players examine the scenario briefing within the game. For example, the bitmap for the "Middle East 73" scenario is named "Middle East 73.bmp". You should use a 256x256 low contrast "blue brushed" image similar to those already in use. Those of you with a paint program can create the appropriate look by taking a grayscale image and blending with the texture_sce.bmp bitmap located in your graphics sub directory.

Unit Types

Most unit capabilities are defined entirely by equipment assigned and other unit characteristics. Some unit types, identified by unique symbols, have special capabilities.

Opart300-2

Opart300-2 is a special version of the standard game / editor program. It uses data structures designed for larger scenarios and has higher memory requirements than the standard game executable (opart.exe). Opart300-2 can load and edit or play any scenario, although it may be slower than the standard (opart 2.exe) game program.

Special File Extensions For Opart300-2

Opart300-2 uses the following file name extensions: *.sal,*.pbl,*.mal,*.ool. These are large (Opart300-2) versions of *.sav,*.pbm,*.map,*.oob.

Opart300-2 Scenarios And The Standard Game

Scenarios designed for use with this special version of the game can not be played or edited using the standard version of the game.

Equipment Density

Up to nine units may be grouped in any particular location, but in many cases this is a bad idea. Each location has a specific allowed equipment density. (50 + 2 x scenario physical scale2).

Scale	Allowed Density
2.5km	68
5km	100
10km	250
15km	500
20km	850
25km	1300
50km	5050

Any location with more than the allowed number of vehicles or horse teams suffers from traffic jams (increased movement costs to enter). Any location with more than the allowed number of ‘‘active defender’’ equipment suffers from increased losses in the event of combat.

Unit Quality Calculation

Quality = (2*proficiency+readiness)/3.

Unit Combat Strength Calculation

Strength = equipment strength x (2 x proficiency+readiness+supply)/4.

Notes On Combat Resolution

Combat resolution in TOAW Volume I was based on cumulative mass fire. This is still true of artillery fire in Volume II, but anti-tank and anti-personnel fire are now handled at the level of individual weapons firing at individual targets. Each item has a maximum of from one to three shots on any given round:

MAXIMUM RATE OF FIRE, PER ROUND OF COMBAT

EQUIPMENT CHARACTERISTICS	ATTACKING	DEFENDING
MOTORIZED,LONG RANGE,HELICOPTER	3 shots	3 shots
STATIC OR FIXED	1 shots	2 shots
EVERYTHING ELSE	2 shots	3 shots

Individual weapons try to engage appropriate targets. There is some randomization, but the toughest targets will tend to draw fire from the most lethal enemy systems.

Note that this has numerous side effects. Among them: Large towed anti-tank weapons are now much less effective on the attack than before. AFV's are now relatively more lethal than before. Losses to very large forces attacking very small forces will be smaller than under the old system.

The actual number of shots fired by engaged units is dependent upon relative overall engaged strength in each individual combat, but will not exceed the theoretical maximum sum expected for all weapons based on the table above. All shots actually fired by anti-personnel weapons are assumed to be lethal. In most cases this will give results very similar to those expected in TOAW I (much of the code is the same - it is simply interpreted differently down stream). Anti-armor fire is quite different. In order to be lethal, any given anti-armor shot must first hit the target (see targeting below). Each hit must then be able to defeat the armor protection of the target equipment. Each armored target has one strength vs. HEAT weapons and another vs. kinetic weapons (also includes top-attack weapons). See the Equipment database for effective armor values.

ANTI-ARMOR CHANCE TO HIT, PER SHOT

EQUIPMENT CHARACTERISTICS	CHANCE TO HIT		
	Restricted Vision	Normal	Open Vision
TARGETING++++	85%	100%	100%
TARGETING+++	85%	85%	72%
TARGETING++	85%	75%	56%
TARGETING+	75%	50%	25%
EVERYTHING ELSE	50%	33%	11%

Note that restricted vision locations actually benefit simpler weapon systems while reducing the capability of more advanced systems. On the other hand, open vision rewards more advanced systems (nominal chances to hit are squared). Open vision locations have no precipitation and no terrain other than open, arid, roads, rivers, rocky, escarpments, canals, or sandy. Restricted vision locations have heavy precipitation, heavy cultivated, urban or urban ruin, or forest terrain.

ANTI-ARMOR CHANCE TO DEFEAT ARMOR, PER HIT

pq=100xANTI-ARMOR/DEFENSIVE ARMOR	CHANCE TO KILL
100+	100%
99...25	((pq^2)/100)%
24-	0%

This means there is no chance to kill armor unless the firing weapon has at least 25% of the nominal penetration necessary to defeat the target's armor. Because of the square involved, the chance to kill declines rapidly with decreasing pq (penetration quotient).

EXAMPLES: CHANCES TO KILL

pq	CHANCE
99	98%
90	81%
80	64%
70	49%
50	25%
40	16%
30	9%
25	6%

Example calculation:

T10M Anti-Armor 112 (HEAT), Targeting+ fires on M60A1 (Improved) armor 127, 165 vs HEAT

Chance to hit=50%
pq=100x112/165=68
Chance to kill if hit=((68^2)/100)%=46%
Overall chance to kill=50%x46%=23%.

Anti Aircraft fire is roughly similar to anti-personnel fire.

When an APC class item of equipment is destroyed in combat, there is a chance (based on the proportion of infantry and transports in the unit) that an infantry squad of some kind belonging to the same unit will also be destroyed.

Nuclear Weapon Yields

Nuclear capable systems are individually rated for nuclear attack strength. The following values are defined for various equipment:

Yield	Conventional Equivalent
0.1kT	25
0.2kT	50
0.5kT	125
1kT	250
2kT	500
5kT	1250
10kT	2500
20kT	5000
25kT	6250
40kT	10000
50kT	12500
60kT	15000
100kT	25000
200kT	50000
300kT	75000
500kT	125000
1mT	250000
4mT	1000000

These values are added to a unit's conventional attack strength. At sub-kiloton levels the addition may not be particularly significant.

Seeing the Elephant

When a unit's actual proficiency is determined upon conversion from untried to veteran status, its proficiency can vary by +- 33% the original value. Unlike the determination used in Volume I, the resulting proficiency is not completely random. Veteran values will tend to fall near the expected proficiency.

Using Air Units

The long term effectiveness of your air units is inversely proportional to their apparent visibility over the battlefield. Sad perhaps, but true. While it may be fun to launch an air strike on a particular location, this is the least effective way to use your air units. Sometimes you really need the immediate firepower. If so, go for it. Remember that there is a cost though. Combat support missions are moderately efficient, and again, sometimes you can't do without them. Unfortunately they also grind your units down more quickly than any other mission. They are also a dandy way to draw enemy fighters into the fray, which may or may not be a good thing depending on the local air superiority equation. If you have air supremacy (the enemy can't effectively contest your air superiority strength), your units will be most effective on interdiction missions. Few things wear the bad guys down as quickly as empty fuel tanks, magazines and mess kits, and the inability to move near roads and railroads can be a real nuisance. If the enemy air force is much stronger than yours, keep your air units on air superiority missions and hope for the best. Consider keeping your best ground attack units out of the action. They may be more effective as a threat, forcing your opponent to maintain a strong air superiority effort at the expense of his interdiction and combat support efforts.

Combat Planning Considerations

All units will have their movement allowances reduced to reflect the amount of time necessary to resolve all attacks. This means you should move most of your units before resolving any attacks. If you believe all attacks will be resolved quickly you should hold back a few high movement allowance units for use as an exploitation reserve. If you wish to exploit any breakthroughs before your opponent can react, consider holding off on the kinds of attacks that are likely to take a long time to resolve – those involving units that have expended most of their movement allowance and fixed attacks on defensive positions with probable "ignore losses" orders emphasis.

Nuclear Weapons

If you find that you have the option to use Nuclear weapons, be sure to check the scenario briefing. In almost all cases there are significant potential costs associated with these weapons.

Keeping Your Units Supplied

There are a few things you can do to maximize the amount of supplies flowing to your units:

- Make sure to keep your lines of communication open. Don't let the bad guys cut in behind you.
- Don't move your units unless necessary.
- Keep your units near a cooperative headquarters unit.
- Avoid using your theater transport assets (air transport, rail transport, and naval transport) for moving units.
- Avoid "boondocks" deployments. Try to keep your units in urban locations, on roads, ports or airfields.
- If your opponent has a strong interdiction capability (lots of air units capable of performing interdiction missions), keep some of your air units on air superiority duty.

Hotkeys

The game supports a number of hotkeys.

Message box style dialogs (those without ‘‘checkmark’’ style exit buttons) now accept input from the number keys (either on the keypad or the main row at the top of the keyboard) to select from available options. The options buttons in these dialogs are always arranged vertically. The ‘‘1’’ key selects the top button. ‘‘2’’ selects the next button, etc.

The ‘‘Escape’’ and ‘‘Enter’’ keys can be used to exit any standard game dialog with a ‘‘checkmark’’ style exit button. The will also exit from the small ‘‘message box’’ style dialogs if there is only one possible choice.

F1 brings up the help file.

The numerical keypad number keys can be used to scroll the map or center on the current unit.

1 – Southwest

2 – South

3 – Southeast

4 – West

5 – Center on current unit

6 – East

7 – Northwest

8 – North

9 – Northeast

The ‘‘arrow’’ keys can be used to scroll the microview map.

Several general utility keys are available. These keys are not case sensitive.

A – Bring up the air unit report.

C or F2– Group Composition: The group in the map location currently under the mouse cursor is displayed in a small dialog similar to one of the location panes in the attack planning dialog. If the cursor is not over an occupied location, the group in the current unit’s location will be displayed. This can be used to examine friendly or enemy occupied locations. If you click on a friendly unit in the dialog, it becomes the new current unit. The group composition dialog is also available in the map panel right mouse button popup menu as "Show Group Composition".

E – Resolve all combats or end turn.

F – Bring up the formation report.

G – Get the next unit stacked with the current unit, bring it to the top of the group stack, and make it the current unit.

I – Toggle unit icons visible or invisible.

M – Toggle standard unit icon display mode between movement and strengths.

O – Bring up the Order of Battle report. (game only)

P – If the current unit has attack orders, bring up the attack planning dialog.

U – Bring up the unit report..

W – Toggle the map pane weather view on or off.

Z – Undo

- Select previous unit.

+ Select next unit.

Why are the strengths shown in the quick reference displays scaled?

The strengths shown in some of the game displays are scaled to two digits. This is done to allow us to show useful information to players. Contrary to what some of our mathematically challenged brethren seem to think, the scaled reference numbers are directly related to unit performance. Scaling the numbers does not invalidate them. It merely allows us to show them in the space available. Because of the way the scaling works, very small units don't differentiate all that well. One unit with a displayed strength of 1 might actually be almost twice as strong as another unit with a displayed strength of 1. But in most scenarios, these small units are both rare and fragile. Load a scenario and check it out. A battle between two such "1 strength" units is relatively unpredictable, in part because both units are typically on the verge of evaporation. That's not such a bad thing. But a unit with a displayed strength of 3 really *is* about three times as strong as a unit with a displayed strength of 1. Given the uncertainties of combat, the knowledge that the actual internal strengths are 103,100 vs. 37,500 would be useless to players.

Why can air and artillery units participate in so many combats during a turn?

Given the time scale of a typical scenario, most air units and artillery batteries dedicated to battlefield support spend much of their time waiting for specific orders. They are capable of Herculean "surge" capabilities when the requests begin to flow in, although at the expense of significant readiness and supply costs. Air and fire missions are simply added to the queue and somehow manage to get done right up to the point that the unit runs out of aircraft or artillery tubes – typically well beyond the nominal capability of the unit. This is one subject I know from first hand experience (USAF 1976-1980). Few things are more depressing to an avionics weenie (me) in an interceptor squadron than the sight of 16 "broken" airplanes after a surge. To borrow a game analogy – it's orange stripe time.

What is evaporation?

Evaporation happens whenever a unit loses cohesion. While history is replete with tales of units that fought to the last man, these are unusual cases. There are many more examples of units that simply dissolved, even if only temporarily, under enemy fire. Units, even good units, can only take so much.

In most cases evaporation is different from what most wargamers are used to calling "elimination". Unless the evaporating unit is isolated, all surviving troops and equipment are still available for distribution to other units. Isolated units (those not able to trace a line of communication back to a friendly supply point), on the other hand, are truly eliminated when they evaporate. Their troops and equipment are permanently lost – assumed surrendered to enemy forces.

Time allowing, many evaporated units will eventually be reconstituted from available replacements.

Why doesn't enemy controlled territory block lines of communication?

What is "enemy controlled territory"? In TOAW it is a location that was last occupied by the other fellow. Unless you put something in or adjacent to a location nothing is assumed to be there to stop the trucks, mules, bearers, etc. Empty locations are not assumed to be chock full of steely eyed military police. Why should it be any other way? If you keep in mind the fact that units block supply passage in and adjacent to their location, it isn't difficult at all to isolate large pockets of enemy units once you break through his defenses.

Why so much detail?

Part of the reason is historical "chrome". Many players like to know what kinds of weapons their units are armed with. But there are important simulation (realism) reasons as well. Real world military units are organized collections of troops and equipment. Except in the simplest cases, they are not well modeled as black boxes with arbitrary "attack" and "defense" strengths. Different types of equipment have different tasks and are exposed to different hazards under enemy fire.

Take the simple case of an infantry regiment under attack. If the unit is in a prepared position, (defending, entrenched, or fortified) the different types of equipment assigned to the unit benefit to greater or lesser extent depending upon specific characteristics. Infantry gains tremendous benefits from prepared positions. Artillery gains smaller benefits, and vehicles get the smallest benefit of all. The overall effect of the prepared position depends upon the exact mix of equipment in the unit. When the enemy attacks, all of the different strength and capability modifiers are taken into account to determine the actual performance of the unit. Then there is the "structure" of a battle to consider. Artillery fires first, followed by anti-personnel and anti-armor fire. It is possible for units to retreat or break off after just the artillery fire. Unless the unit is very small, or under attack from the rear or flank, things like trucks and guns are much less subject to losses than infantry and tanks. So if a badly mauled infantry regiment retreats from combat, its line troops may be decimated while the support elements (artillery, transport) are hardly damaged. And this barely scratches the surface of what we can do using equipment based units. How could you simulate these effects with monolithic (not equipment based) units? You can't. Now the detail doesn't have to be rubbed in players' faces. In fact, you can play TOAW without ever looking at the details in a unit report. But since the details are necessary for simulation reasons, I decided there was no great harm in making them available for curious players as well.

Finally, believe it or not, building units up from a database of available equipment makes it easier for scenario designers to do a good job of creating units with historical capabilities. As long as they have access to order of battle and unit proficiency information they can simply build the units from their references. Assuming no significant problems with the equipment database, these units will have historical capabilities.

Version Release Notes

The Operational Art of War, Volume II
Version 1.00

This is the initial release version of the game.