

Introduction

The Operational Art of War is an integrated simulation and scenario editor covering military campaigns over the 1939-1955 period. 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 a World War II Corps. 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 ½ day 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.

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 can 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 can 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 turn certain game rules on or off, and to set the programmed opponent intelligence and handicap levels. See Rules and Programmed Opponent Options on page ## 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

All game rules effects options default to “on”. The rules in this manual describe the way the game behaves with all options on. If you turn any options off, they will simplify the game by removing the affected rules. You can select the strength of the programmed opponent by setting the programmed opponent options.

Once a scenario is started, the options for that scenario are saved and can not be changed. Use the Set Game Options dialog to change rules or programmed opponent options before starting a scenario.

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 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.

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.

General Usage

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.

The game window is limited to a minimum size of 640x480, and a maximum size of 1152x864.

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). A number to the right of the attack strength icon indicates the unit's attack strength. If the unit can fire long distances at enemy units, the range is shown next to the attack number. A number next to the defense strength icon indicates the unit's defense strength. Finally, a number next to the movement allowance icon indicates the unit's current movement allowance.

Several icons can appear along the right side of the Unit Panel to show that the unit can perform certain special actions: Building or blowing bridges, boarding or debarking 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.

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 (see below) 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 (10%) of this strength is also used against enemy armored equipment.
- 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 (see below), 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.

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 25% 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.

Unit Deployment Orders

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. 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 units only. The unit will perform theater interdiction missions.
- **Air Superiority Mission** – Air units only. The unit will perform air superiority missions.
- **Combat Support Mission** – Air units only. The unit will support friendly ground units during attacks.
- **Rest Mission** – Air 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 not have moved during the turn, and it 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 not have moved during the turn, and it 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

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 significant losses, the unit will break off or retreat.

Division into Sub Units

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 ($80\% \times 110\% = 88\%$)

Air, naval and headquarters units may not be divided.

Unit Special Capabilities

Many units have special capabilities, based either on the equipment assigned or the unit icon symbol. See the Unit Types appendix for information on unit icon symbols.

- 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.
- 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). See Engineering.
- Airborne Units: These units are eligible for air transport and airdrops.
- Special Forces: These units have large reconnaissance capabilities and a special capability to easily move near enemy 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.

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:

- All Weather Equipment-The equipment has a night / all weather capability. This is primarily used by aircraft.
- Amphibious Equipment-The equipment has an intrinsic amphibious movement capability.
- Anti-Shipping Equipment-The equipment has a strong anti-shipping capability.
- Armor Equipment-The equipment is armored.
- Atomic Armed Equipment-The equipment can make atomic attacks if atomic bombs are available.
- Carrier Naval Equipment-The equipment can base naval aircraft units.
- Active Defender Equipment-The equipment actively contributes to a location's defense, and is directly exposed to enemy action during combat.
- Engineer Equipment-The equipment has an engineering capability.
- Fast Motor Equipment-The equipment uses the fast motorized movement rate.
- Heavy Naval Equipment-The equipment is a heavy naval vessel.
- High AA Equipment-The equipment has an anti aircraft capability against high altitude aircraft.
- High Air Equipment-The equipment is a high altitude aircraft.
- Horse Equipment-The equipment uses the horse movement rate.
- Light Naval Equipment-The equipment is a light naval vessel.
- Long Range Equipment-The equipment has a ranged fire capability.
- Low Air Equipment-The equipment is a low altitude aircraft.
- Major Fording Equipment – The equipment can enter super river or Suez Canal locations and can assist other units in entering this terrain.
- Medium Naval Equipment-The equipment is a medium naval vessel.
- Motor Equipment-The equipment uses the motorized movement rate.
- Naval Air Equipment-The equipment is a naval aircraft.
- Rail Move Equipment – The equipment always moves by rail movement. It does this without using rail transport capacity, but can only move by rail.
- Rail Repair Equipment-The equipment can repair damaged rails.
- Recon Equipment-The equipment has a reconnaissance capability.
- Slow Equipment-The equipment uses the foot movement rate.
- Slow Motor Equipment-The equipment uses the slow motorized movement rate.
- Static Equipment-The equipment requires transport in order to move.
- Transport Equipment-The equipment can transport other equipment.

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.

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 highlight.

Formation Support Scope

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 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

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 Editor.

Climate and Weather

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.

Theater 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 relative air superiority strengths of each force. Depending on circumstances, there are two types of air superiority strength:

- A force's Theater Air Superiority strength is the sum of anti-air high strengths of all friendly air units performing air superiority missions. Range and location are not considered.
- A force's Local Air Superiority strength is the sum of anti-air high strengths of all friendly air units performing air superiority missions within range of a location.

Theater Air Superiority affects units flying Interdiction and Air Superiority missions. Local Air Superiority affects units flying combat support and local air superiority missions.

Even if no other missions are flown, opposing units with air superiority missions will fight at the beginning of each turn.

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 enemy Theater Air Superiority efforts, but are protected by friendly Theater Air Superiority.

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

Intelligence Gathering

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”.

Local Patrols and Guerillas

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

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 supplies 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.)

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.

Theater Interdiction Effects

Enemy air units flying interdiction missions impair supply distribution.

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.

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.

Local Terrain Effects

Some terrain types influence re-supply levels. Units in locations without roads, improved roads, railroads, urban locations, and airfields will receive only 50% of their normal supplies.

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 receive replacements from your force equipment stockpiles if they are understrength and in supply. In most scenarios, your force replacement stockpiles will be replenished on a regular basis.

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 will appear “untried”, in an urban location distant from enemy units.

Rest

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.

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

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.

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

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. 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 only subject to reorganization on turns following heavy combat.

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.

Giving Orders to Your Units

You order normal movement or combat by right clicking on a map location. 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.

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 unit enters an enemy controlled location, that location becomes friendly controlled.

Railroad Damage

Any railroads in an enemy controlled location are damaged when a friendly unit enters the location. 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 Theater Interdiction Level, modified by local weather conditions. Hazy weather reduces the interdiction strike chance by 50%, and overcast weather reduces it by 66%. Units on roads or using rail movement are particularly vulnerable to interdiction strikes. Any enemy air units striking your units will be attacked by your Local Air Superiority effort and are protected 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

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 either the origin or 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 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.

Should your unit fail to disengage cleanly 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. Only the moving unit will take losses, which may force it to retreat, divide into sub units, or (in a worst case) disband.

Attack Popup Menus and Attack Planning

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, below). 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 (see below).

Attack Deployment

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

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.
- Atomic Attack – The unit will launch an atomic attack.
- 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

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.

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. An air transport icon in the Unit Panel shows eligibility for airborne movement. Click on the icon to bring up the unit report and 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. 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 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.

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.

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

The presence of units in a location can increase the standard cost for entering the 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. If there are already 9 units in the location, or if there are any enemy units there, the movement is not allowed. If there are fewer than 9 friendly units in the location, the maximum standard cost for entry is based on the unit's movement category:

- Maximum Standard Cost (foot or mixed movement):3
- 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 +1, all others +2.
- Non Playable: Not allowed.
- Railroad: No effect, unless using rail movement.
- Rocky: Foot movement +1, all others +2.
- Sand: +1
- Snow: Motorized Movement+2, ski no effect, all others +1.
- Unfrozen River or Canal: Amphibious units no effect. All others +2 (usually – see River Movement Costs below).
- Unfrozen Shallow Water: Not allowed.
- Unfrozen Super River or Suez Canal-Amphibious units cost is 2, all others not allowed.
- 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
- 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.

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 playable location at a cost of 1.

Railroad Movement Costs

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

Bridge building / demolition

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

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. 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

Only 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.

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 below for definition of 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, anti-armor combat then 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. Finally, 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.

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.

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.

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.

Atomic Attacks

Atomic attacks are assumed to be using 20kt weapons (roughly the size of the Hiroshima and Nagasaki bombs), and their lethality is based on the physical scale of the scenario. Effects are limited to the target location. Armored equipment is much more resistant to atomic attacks than non-armored equipment. After an atomic attack, the location will be contaminated for the remainder of the scenario. Units remaining in contaminated locations will suffer reductions in readiness every turn.

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%, it's effective anti-personnel strength on the first round of combat would be 19.

Target Density

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 will add their bombardment strengths to each attack within range. 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

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

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
- 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 fortified x1.5.

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
- 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.

- 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.

Escarpmnts

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

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

In 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.

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.

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.

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.
- 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.
- Weather Briefing – Show a current weather report, with a forecast for next turn.
- 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.
- 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.
 - 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
 - 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 traces in the map panel.
 - Supply: Visible – Show the all supplied locations in the map panel.
 - 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.
- 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.
- 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 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.
- Modify Current Formation – Modify the entire 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.
- 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.

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 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.

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 or its parent formation are reorganizing, the numbers will appear in a red band.

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.

The Unit Report

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 and 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

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

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 gas or atomic bombs. 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. 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, which affect supply distribution and land unit movement. Use the control bar exit button to exit the dialog.

The Weather Briefing

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, beginning turn, end turn, 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 (see below). 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.

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 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, Short Range Artillery, Long Range Artillery, SP Artillery, SP Long Range Artillery, Transport and Light Reconnaissance, Tanks and SP Guns, Ships, 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.)

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 Tanks, Recon, SP Guns 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 to scroll by an entire page. You should be looking at a list of French and German armored equipment. If not, scroll around using the next / previous buttons until you see a button labeled PzKpfw 35t. Click on this button. A "how many" dialog will pop up. Enter the number 39. Now use the same procedure to add 30 PzKpfw IIB, 13 PzKpfw I, and 6 PzKpfw Ivb. You have just authorized the equipment for a typical 1940 mixed German Panzer battalion. Now click on the name button at the top of the Unit Control Panel to change the name of the unit to "1st Panzer". Click on the unit size symbol button just below and to the left and select the battalion symbol. Click on the unit icon colors button just to the left to select a medium gray icon with light gray 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, and supply buttons to set those values for the unit. That's it, 1st Panzer Bn is now fully defined. If you click on the copy unit button at the bottom of the display twice, that will create two copies of the unit.

Click on the display current force button at the bottom of the Available Systems panel. You should see three units. You can select each in turn and rename it using the unit control panel name button. Click on the unassigned button at the top right of the Force Control Panel. This will assign all three units to a formation. If you wish, you can click on the flag button at bottom left to select 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. Click on the formation name button to change the name to 1st Panzer Rgt, then click on the formation support level button just to the left until it shows "army support". Units of the formation will now be free to act in concert with other units using the same icon colors, regardless of their parent formations. This might be typical of an independent corps level Panzer Regiment. 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 French, 1940) 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.

This example was set up to show how to create a simple force. If you are creating a larger force 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 editor) 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 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 “half 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.

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.

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.

Dump the Korea 1950 scenario and examine it for an example of a functional event list.

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 and an exit event editor button.

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 occurrence
- **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. For example, in the Korea '50 scenario the U.N. player initially receives Shermans, then Pershings, and finally Pattons. 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.

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 there is already a current formation objective in the location it will be removed.
- **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.

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.
- **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.

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.

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.

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.

Finally, set all formation orders and objectives. Set formation orders and orders emphasis using the buttons at the bottom of the formation report. 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. Objectives with a zero victory point value will be invisible when you play the game.

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- Highlight possible strong event features, such as Chinese or Soviet intervention in Korea. 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. TOA is designed to handle classic mechanized campaigns. It won't do well with things like island hopping, although it can handle something like D-Day, Sealion or Operation Chromite. Do not attempt explicit naval campaigns. Naval combat is weakly modeled. If you really need to handle naval campaigns (as in the Mediterranean, WWII), 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 1 moves 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.

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.

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.

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.

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. For example, some of the armored units in the Korea scenario start with a number of M-24's or Shermans. If you examine them closely in the editor you will see that they have authorizations for Pershings and Pattons, but no assigned equipment in these slots. Check the U.N. replacements for that scenario and you will see that Shermans are replaced early, tailing off to be followed by Pershings and finally by Pattons. Each equipment replacement schedule overlaps, but the result is that U.N. units will slowly transition from Shermans to Pershings to Pattons over the course of the scenario.

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 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. The Soviets, for example, had very large supply stockpiles from 1943 on. But their offensives usually stalled after a short advance because they lacked the ability to rapidly distribute supplies to the troops needing them. This is in fact the primary driving force behind the Soviet practice of attack by echelon. West: Good force supply stockpiles. Good formation supply distribution efficiencies. Good unit supply levels. Communist: Good force supply stockpile levels. Poor formation supply distribution efficiencies. Situation dependent unit supply levels.

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 (just about everyone but the U.S. and British) should be chronically understrength in transport assets.

Event Supply Modifier Effects

Even in simple scenarios you may wish to modify force supply stockpile levels. Consider the case of Allied forces in France, 1944. Loss of any of the ports bringing in supplies would have had a severe impact on the overall supply availability. In Korea, 1950, loss of Pusan would have been devastating to the U.N. supply stockpile. You can model this partly by assigning different supply points for different ports of entry, then using the event engine to set the overall supply level depending upon who occupies different locations.

Scenario Briefing Bitmap

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 "Korea 1950" scenario is named "Korea 1950.bmp". You should use a 256x256 low contrast "green 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. Note: Scenario Briefing bitmaps only appear in 16 bit or higher color depths. The game does not display these bitmaps in 256 color mode.

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.

Suggested Force, Formation, and Unit Characteristics Settings

Nationality	Force Proficiency Formation Supply Distribution	Force Supply Stockpile Efficiency	Formation Proficiency Unit Proficiency	
France 1940	60	25	60	60
Germany 1939	70	25	70	60
Germany 1940-1941	80	25	80	65
Germany 1942-1944	75	25	80	70
Germany 1945	70	20	70	60
Italy 1939-1944	60	25	60	60
Japan 1939-1945	60	15	60	50
Poland 1939	60	20	60	60
Soviet Union 1939-1941	60	25	60	20
Soviet Union 1942-1945	70	30	70	30
Soviet Union 1946-1955	70	30	70	50
United Kingdom 1940-1942	70	20	80	65
United Kingdom 1943+	75	25	80	70
United States 1940-1941	60	20	70	70
United States 1942-1943	65	25	70	70
United States 1944	70	30	80	80
United States 1945	70	40	80	90
United States 1946-1950	50	25	80	100
United States 1951-1955	70	30	90	100

Notes:

- 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+ supply levels at the start of a scenario. This is particularly true of the Soviets after 1942.
- 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. Forces should generally 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.
- These suggestions are for typical front line units. Elite units should have generally higher values, and second line units should have lower values.

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. $(50 + 2 \times \text{scenario physical scale}^2)$.

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 = $(2 \times \text{proficiency} + \text{readiness}) / 3$.

Unit Combat Strength Calculation

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

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.

Atomic Bombs

If you find that you have the option to use Atom bombs, 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 theater interdiction capability (lots of air units capable of performing interdiction missions), keep some of your air units on air superiority duty.

