TACOPS ™

Version 4

User Guide

(Macintosh & Windows)

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Contents

1. Introduction

It is strongly recommended that after installing TacOps you begin by playing the Basic Training scenario while following along in the TacOps Tutorial (Appendix A). This part of the manual assumes that the tutorial has been read and does not repeat some of its material and play hints.

Be sure to check the "readme.txt" file in your TacOps directory. The file may contain change information and useful game play hints.

TacOps is a simulation of contemporary and near-future tactical, ground, combat between United States (US), Canadian (CA), and New Zealand forces versus various opposing forces (OPFOR). Most vehicles, unit organizations, and weapons are those that are expected to be in place by the year 2000. Some weapons and capabilities that are likely to be available over the next ten years are included as options. Some older organizations and weapons are included as options. The primary focus of TacOps is ground operations from the perspective of the battalion or regimental commander. The movement and interaction of infantry and armor units is treated with great detail. Supporting air and artillery activities are treated more conceptually.

TacOps may be played solitaire against an OPFOR computer opponent, or between two or more players on one or more computers. Play between multiple computers may be accomplished by using a network, by exchanging small files via disk, by direct modem connection, by mail, or by electronic mail.

TacOps is played in turns. Each turn consists of two phases: an orders phase and a combat phase. Each phase occurs simultaneously for both players. In the orders phase you give orders to your units using buttons in windows and by tracing the intended movement of your units with mouse clicks on the screen. Once all orders have been given, the combat phase begins. During the combat phase the units of both forces, under computer control, simultaneously carry out their orders for movement and combat in four, fifteen second pulses. You only observe during the combat phase; you can not give or change orders until the next orders phase.

In TacOps you are a commander, not a gunner. Your control of weapons fire is limited to positioning your units with movement and disposition orders, setting minimum or maximum engagement ranges, and designating priority targets.

TacOps features hidden movement to replicate "fog of war". The simulation begins with enemy units showing on your screen only if they are in some friendly unit's line of sight and visual range. You may also choose to see all units at all times.

You can use the **Preferences Window** and the **Options Menu** to tailor TacOps to better support your personal gaming interests and opinions.

Note 1: Whenever selection of a menu item is mentioned, the menu item will be shown in the format "**Menu/Menu Item**" - for example the "**Save Game**" item in the "**File**" menu would be referred to as the "**File/Save Game**" menu item.

Note 2: Some illustrations in this guide differ slightly from their screen appearance. This was done for printing clarity.

2. Installation

[Microsoft Windows] Insert and open the TacOps CD. Double-click on the TacOps installation file on the CD named setup.exe. Follow the screen instructions.

[Apple Macintosh] Insert and open the TacOps CD. Drag (copy) its contents onto your hard drive.

2.1 Minimum System Requirements

[Windows] Microsoft Windows 95 or newer. Ten megabytes of memory remaining for TacOps after your Operating System has loaded - fifteen to twenty megabytes is recommended. A hard disk drive. Color monitor providing at least 256 colors or shades of gray. Setting your system to use more than 256 colors is OK but the game screens will not look significantly different and much more memory will be required to run the game.

[Macintosh] Apple Corporation System Software Version 8.0 through 9.x. OSX in Classic mode. A hard disk drive. Color or grayscale monitor set for at least 256 colors or shades of gray. Ten megabytes of memory available for allocation to the program - fifteen to twenty megabytes is recommended. Some very large scenarios or maps will require more memory in order to retain all game features. If you use 1000s or millions of colors (not recommended) then you will have to allocate even more memory to the program.

2.2 TacOps Files

TacOps works fastest and easiest if all scenario, map, and other support files are kept in their original factory named directories or alternately at the same directory level as TacOps.exe. Do not rename any of the factory provided files. The TacOps game package includes the following files or file types.

TacOps.exe (Windows): This is the game engine. It requires the Windows OS and a number of TacOps unique support files in order to function.

TacOps (Macintosh): This is the game engine. It requires a Macintosh OS and a number of TacOps unique support files in order to function.

Filename.sce (Windows) (Macintosh if no ".sce"): Example - Anderson.sce or Task Force Anderson.sce. This is the data file for each scenario. This file contains data defining the mission or victory conditions for each player, the starting order of battle, any optional forces, and opening moves and general battle plans for the computer opponent. Some scenarios have multiple variants. Most scenario titles begin with the words "Task Force", "Team", "Battle Group", or "Combat Team" followed by a play tester's name. "Task Force" scenarios usually feature US forces of battalion size or larger. "Team" scenarios usually have US forces of less than battalion size. "Battle Group" scenarios usually feature Canadian forces of battalion size or larger. "Combat Team" scenarios usually have Canadian forces of less than battalion size.

Mapxxxc.map (Windows) (Macintosh if no ".map"): Example - Map001c.map. This is a Type1 map data file which contains both map art and a terrain data base. Type1 map data files begin with "Map" , continue with a three digit number, a "c", and end with the ".map" extension (Windows).

Mapxxxc.dat: Example – Map213c.dat. This is a Type2 terrain data file which contains only a terrain data base. Type2 terrain data files begin with "Map" , continue with a three digit number, a "c", and end with the ".dat" extension. A Type2 map requires both a Mapxxxc.dat file and a Mapxxxc.map file.

Mapxxx.bmp: Example - Map213.bmp. This is a Type2 terrain file which contains only map art. Type2 terrain art files begin with "Map", continue with a three digit number, a "c", and end with the ".bmp" extension. A Type2 map requires both a Mapxxxc.dat file and a Mapxxxc.map file.

zFanfareA.wav, zFanfareB.wav , zFanfareC.wav (Windows) (if Macintosh no ".wav"): These files contain digitized music.

Auto Saves: This folder contains temporary saved game files that are automatically generated by the program at the beginning of each combat/movment phase. The contents of this folder may be deleted by the user at any time.

zHelp: This folders contains text files of hints occasionally displayed by TacOps.

zPhotos: This folders contains the unit and weapon photos displayed by TacOps. Some photos are drawn in shades of gray rather than true color.

TacOps may automatically or semi-automatically create the following types of files during use.

AutoSave.tac: If the user has check marked the File/Auto Save Last Turn menu item, this file is produced automatically every time TacOps begins a combat phase. Each time this file is created, it will replace the file of the same name that was created by any previous automatic save. This is the default autosave condition whenever TacOps is started. If your computer should lose power, hang, or crash during a TacOps gaming session, this file can usually be used to salvage and restart your game in progress.

AutoSavexxx.tac: Examples - AutoSave001.tac, AutoSave002.tac, etc. If the user has check marked the File/Auto Save All Turns menu item, one of these files is produced automatically every time TacOps begins a combat phase. Each file name will include the turn number in which the file was created. This feature is useful for archiving a sequence of turns for replay use in instructional situations and for CPX (Command Post Exercise) after action critiques and reviews.

SaveGame.tac: This file is created anytime you choose to save a game in progress. You may begin the file name of a saved game anyway you like but it should end with the ".tac" extension. NOTE: If the first character of the US/CA/Blue force password is an asterisk (*) then that marks the saved game file as an instructor prepared saved game. Such a saved game file can be loaded

and played by a student without the student having the password but all options relating to altering the game will still be password protected.

PBM Orders BTxxx.bmo and PBM Orders RTxxx.rmo: One of these files will be semi-automatically created during a play by mail game, each time you send (i.e. save) your orders. You will send one of these files to your opponent before each combat phase of a play by mail game. You will receive one of these files from your opponent before each combat phase of a play by mail game. These files should always end with either "bmo" or "rmo". For more information see the section on play by mail.

PBM Game BTxxx_YYMMDD_HHMM and PBM Game R Txxx_YYMMDD_HHMM: One of these files will be semiautomatically created during a play by mail game, each time you send (i.e. save) your orders. You never send these files to your opponent. For more information see the section on play by mail. [Y year, M month, D day, H hour, M minute].

z_tempsituation.net. This is a temporary file that was automatically created by TacOps during a networked game session. Normally you should never see this file but you might if one or both players quit a networked game improperly. In such a case this temporary file might not be automatically deleted. Generally, if you ever see this filename in a TacOps folder you should delete it immediately. For more information see the section on network play.

2.3 Copy Protection

TacOps is not copy-protected. There are no secret files, no keywords, and no silly questions to look up in the user guide before you can start playing. There is no serial number check for network usage. You don't have to do anything to start a TacOps game session except to double click on the TacOps icon. We hope that you will reward us for this convenience by not allowing others to copy your TacOps game materials.

2.4 User License

Institutional use, educational use, professional use, and or government use require the purchase of a copy of TacOps for every computer upon which TacOps is installed or the purchase of a TacOps general use site license for every computer upon which TacOps is installed.

We don't consider it necessary for an ordinary home user to purchase a second copy of TacOps in order to use the network mode on two computers - both of which he owns - and that are located in a single private residence, Such a person may install TacOps on a second computer with a clear conscience. However, if you play a network game with a friend and your friend provides his own computer, we would appreciate it greatly if you would encourage your friend to buy his own copy of TacOps.

3. Starting The Game

3.1 Startup Screen

Double click on the file titled TacOps. You will see a series of introductory screens and you should hear music and or other sound effects. You may skip past the introductory screen by pressing a key or clicking the mouse as the screen appears. When the Startup Window appears, pick the type of game to be played by selecting Solitaire, Two Players (on one computer), Two Players – Play by Mail, Two Players - Network, or Multiplayer Teams - Network.

If you select play-by-mail or play-by-network, you must also select whether you will command the Blue or the Red force. If you select play-by-network, you must also select whether you will host or join a game session. In order to play a game using networked computers, the computers must be already connected to a Local Area Network (LAN) and or to the Internet and must be capable of using the TCP/IP network protocol. For more information see the section on network play.

Select **Standard Scenario** or **Saved Game**. Click on the OK button. When the **File Selection Window** appears, select and open a scenario file.

You can browse through the situation and mission text for any scenario by selecting the button on the startup window labeled "Review Scenarios". After clicking on this button, you will be shown a file selection dialog. Select and open a scenario file. You will then be shown information on that scenario. Click on the Cancel button to return to the startup screen. If you have installed Adobe Acrobat Reader you can also browse the scenario descriptions in a consolidated form by selecting the "**Help/Guide – Scenarios**" menu item.

3.2 Initial Setup

After you have selected the scenario to load, the map window will appear. The map window contains the battle map and is the primary TacOps window. The battle map may be much larger than your screen. To view more of a large map, scroll the window.

If a saved game is selected, the game will load and start at the point saved.

If a new game scenario is selected, there are several ways that the program may begin depending on how each side's forces enter the game. A scenario may begin with all or some units already on the map and/or with units that won't appear until later in the game.

An **Entry Point Selection Window** will appear if there are units with arrival times occurring after the setup turn. The cursor will change to a cross hair. Each small square with a vehicle or personnel silhouette in it is a unit. The numbers underneath each unit indicate when that unit will appear at the edge of the map. Follow the instructions in the window for selecting the force's entry point. Move the cross hair cursor to the point on the map where you want the force to enter and click. It may be necessary to scroll the map in order to select the entry point. As the game progresses, these units will appear on the battle map at the indicated time at the selected point.

Units which start the game already on the map will appear in a window titled "Setup On map Units".

To transfer the units to the map, select/click on a unit symbol in the **Setup Window** then click on the map where you want the unit to start. The unit will move from the **Setup Window** to the map. You may select multiple units for placement by holding the mouse button down while dragging out a selection rectangle in the **Setup Window** or on the map, or by holding down the shift key while clicking on a series of units. A subsequent click on the map will move all the selected units to that point. If there are rectangles on the map with a heavy gray border, Blue units should normally setup within those areas [be sure to check the entire map, some scenarios have more than one possible startup area]. Heavy black borders define Red setup areas. If there are several setup areas you are free to use any one or all of them. You may choose to ignore startup area limits by selecting the **Options/Ignore Unit Setup Limits** menu item. Continue transferring units to the map until the **Setup Window** is empty, then close the window.

During the setup phase of the first orders turn some scenarios offer entrenchments (explained later) and artillery target reference points (explained later) to a player. These items are also often available as "optional units". They aren't really units, but at this point in the game it is convenient for the program to handle them as units. During the setup phase you place these items on the map just like units and you can reposition them just like units. At the beginning of the first combat phase the entrenchment markers and the artillery target reference point markers are converted to permanent objects and they become an immovable part of the battle map.

Shortcut. During the set up turn, you can split units in the **Setup Window** or on the map by first selecting the unit and then touching the "S" key. You can group or join like units together by selecting several units and touching the "J" key. Similarly, you can also load and unload vehicle units that are transporting infantry by selecting them and touching the "L" and "U" keys. Note: you must select one or more units before using these keyboard shortcuts. If no unit is selected, the key press may be interpreted as a normal menu shortcut key press. You can also access similar shortcuts from a popup menu by right clicking on a unit symbol or by holding down the Ctrl key while clicking on a unit symbol.

Important - As long as the **Setup Window** is open, Units already transferred to the map may be repositioned either by clicking on a unit symbol and then on the map or by selecting multiple units by dragging a selection rectangle or by using the shift key. However, once the **Setup Window** is closed, you must hold down the shift key as you click on a unit's symbol or drag a selection rectangle in order to reposition it.

4. Information Line

There is an information line at the bottom of the screen. You will often find textual hints there on what to do next when the program is waiting for input. At other times you will see notes about what is going on in the game or information about friendly or enemy units.

When a unit on the map is clicked on, the following information will be given in the Information Line in an abbreviated form: (1) Unit name/type (2) "Sx"- strength stated in vehicles or squads or teams, (3) "Px" - if the unit is infantry the strength will also be stated in number of personnel, (4) "Vx" - distance at which the unit may be spotted by normal eyesight and "VTx" - by thermal imaging devices (if currently different from normal eyesight), (5) terrain type at the center of the unit, (6) "Ex" - elevation level at the center of the unit, (7) if the unit is a helicopter, its flight attitude - landed, nap-of-the-earth, or medium, (8) any suppression or damage, and (9) if the unit is capable of transporting infantry, what type of infantry, if any, is being carried inside. Less information will be provided if the unit clicked on is an enemy unit. Three examples of the abbreviated unit information follow.

Example 1: "M1A2 Tank [S4/V400m/Woods/E0]" - This is an M1 tank unit consisting of 4 vehicles. It can be spotted at 400 meters or less. It is located in woods at ground elevation zero.

Example 2: "AAV7 APC [S3/V4000m/Road/Clear/E0] [Inf Squad + MG Team + SMAW Team + Javelin ATGM onboard]" - This is an AAV7 armored personnel carrier unit consisting of 3 vehicles. It can be spotted at 4000 meters or less. It is on a road in clear terrain at ground elevation zero. The AAV7 unit is transporting an infantry squad, an infantry machine gun team, a SMAW team (a light infantry anti armor weapon), and a Javelin anti tank guided missile team.

Example 3: "Inf Squad [S3/P39/V50m/VT500m/Clear/E1]" - This is an infantry unit. The units consists of 3 squads with a total personnel count of 39 troops. It can be spotted using normal eyesight at 50 meters or less, but it can be spotted by a thermal imaging device at 500 meters or less (this suggests that the infantry unit is inside a cloud of smoke). It is located in clear terrain at ground elevation one.

5. Map And Unit Symbols

The battle area is represented by a map-like display on the computer screen. The battle map is often much larger than the screen. To view more of the map, scroll the window by using the scroll bars, by using the hand-cursor, or with the arrow keys. If you prefer more map on the screen, you can remove the scroll bars by deselecting the **Map/Show Scroll Bars** menu item.

[Windows] The TacOps map window can be moved and resized. To move or drag the map window, click in the title bar of the map window - hold the mouse button down and drag the window to the desired position. To resize a map, click in the minimize/maximize buttons in the upper right corner of the map window or click and drag on the edges of the map window or in the lower right corner of the map window - all in the normal Windows fashion.

[Macintosh] The TacOps map window can be moved and resized. To move or drag the map window, click in the title bar of the map window - hold the mouse button down and drag the window to the desired position. To resize a map, click and drag in the tab area in the lower right corner of the map window.

To view a miniature version of the entire battle map, select the **Map/Show Situation Map** menu item. Use the usual window closing procedures or click within the situation map to close the window and return to the regular map. Some maps may not have a miniature situation map display.
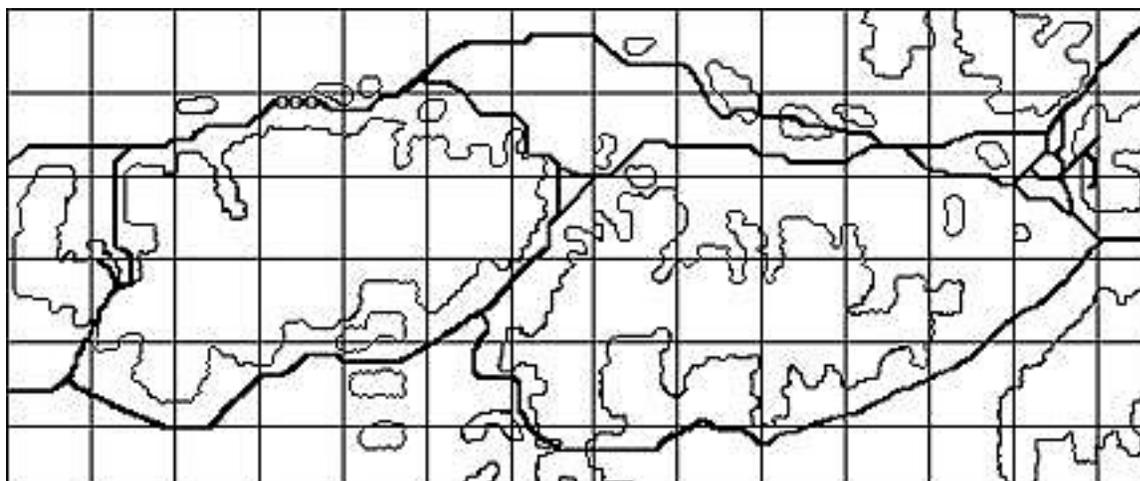
5.1 Terrain Symbols

There are different types of terrain in TacOps - for example road, clear, several types of rough, wooded, water, and town. Each terrain type has its own movement, sighting, and defensive characteristics. There are also two elevations - lower and higher.
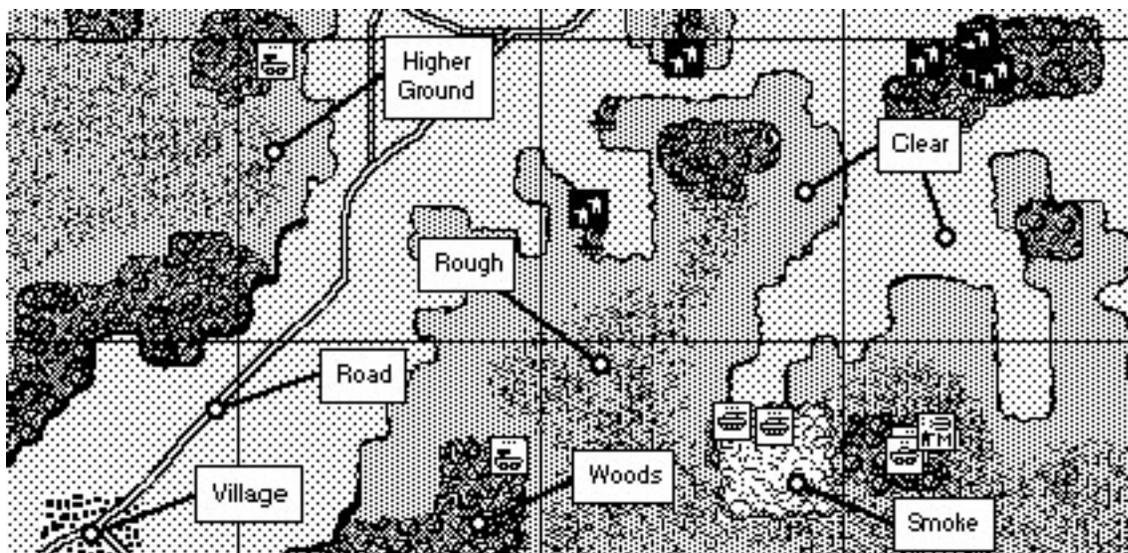
Movement along roads will be faster than other terrain. Rough and wooded terrain hinder movement speed. Some units can cross water and some can not. Higher ground, woods, and villages/towns obstruct line of sight and line of fire. Woods and rough terrain offer defensive advantages and make it harder to spot a unit (i.e. the enemy must get closer in order to spot your unit). A unit's exact position is defined by the center point of its marker.

Important note: if a unit's center point is in town or woods terrain and it is more than 100 meters from the edge of the town or woods, the unit will not be able to see out of the town or woods nor can it be seen by non adjacent units.   However, a unit whose center point is positioned in the first 100 meters (ten pixels) along the edge of woods or town gets the benefit of being in the woods or town for defensive purposes and can both see out and be seen.

High ground in TacOps has a similar 100 meter zone along the contour lines. A unit whose center point is located in the first 100 meters of high ground (i.e. upslope from the contour line) can see into low ground and into high ground and can be seen from both low ground and high ground. Beyond 100 meters it can only see high ground and can only be seen from high ground.

You will need to experiment a bit to get a good feel for how wide these special areas appear on your monitor. Use the **Map/Line of Sight Check** menu item for help in this.

5.2 Checking Line of Sight

The **Map/Line Of Sight Check** and **Map/Thermal LOS Check** menu items allow you to quickly check the range and the normal eyesight and thermal lines-of-sight between two points. When checking the line of sight of a unit, make your start point the approximate center of the unit symbol.

Select the **Map/Line of Sight Check** menu item. The cursor will change to a cross hair. While holding down the mouse button, click on the map at the "look from" point and drag the cross hair around the screen. If the cross hair remains clear then the line of sight to that point is clear. If the

cross hair turns black then the line of sight is blocked. If the cross hair turns gray then there is a clear line of sight to a target point but the point is beyond the scenario's maximum visibility limit. Release the mouse button to quit. To view the special line of sight of a unit equipped with a thermal imaging device, use the **Map/Thermal LOS Check** menu item. Both line of sight routines can also be pinned to a selected unit. To use this feature, select a unit, then select the Line of Sight menu item. Move the mouse to check the line of sight but do not press the mouse button until ready to turn off the pinned line of sight check. If the selected unit has thermal sights the routine will automatically show the unit's thermal line of sight.

When the line of sight tool is in use, the range between the two points will be displayed in the information window at the bottom of the screen as well as the terrain type and the UTM grid coordinates of the end point.

5.3 Unit Symbols

Units are represented on the screen by symbols that indicate their type, facing and tactical disposition. The center point of the symbol indicates the approximate center of mass of the unit. The symbol does not necessarily represent the exact ground covered by the unit. It is assumed that the unit is deployed as appropriate to the unit's basic tactical disposition and size. During the orders phase the symbols can also show if a unit has any pending orders and if the unit has had its orders window opened during that phase. To change the size of symbols select the **Map/Change Unit Symbol Size** menu item or press the **F2** key. To change the information shown on the symbols select the **Map/Change Unit Symbol Info** menu item or press the **F3** key. To change the plotting style of the symbols select the **Map/Change Unit Symbol Style** menu item or press the **F4** key.
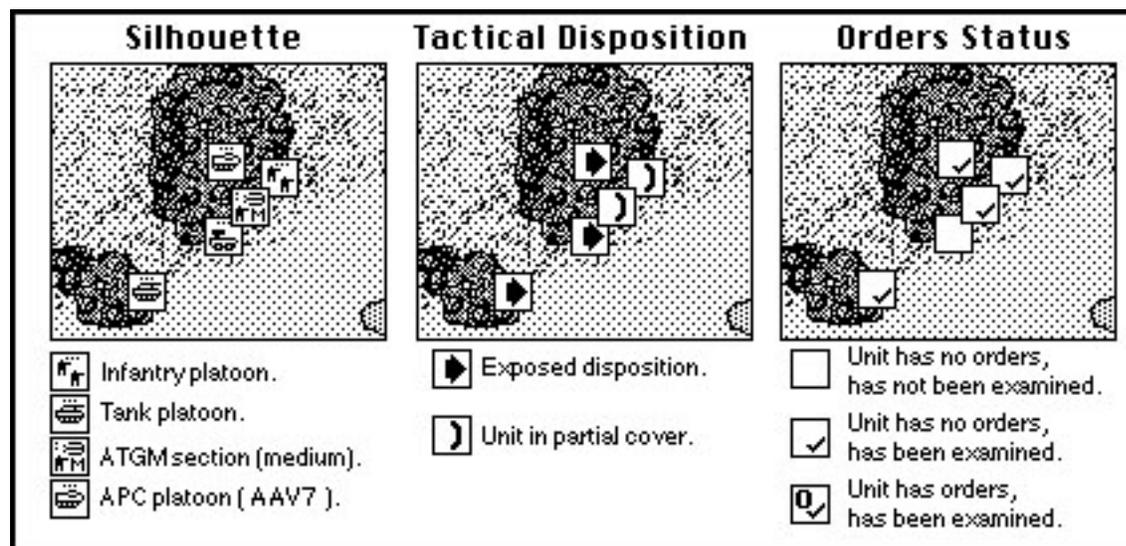
5.4 Unit Silhouette or Wire Frame Symbols

 These symbols show an approximation of a unit's silhouette. They do not necessarily display the unit's true facing or direction of movement. The dots

at the top of the symbol indicate the approximate size of the unit. If there are no dots, the unit contains only one element or vehicle [team/squad]. Two dots indicates two elements or vehicles [section/squad], while three dots represent three or more elements or vehicles [a platoon]. A solid bar at the top of the unit symbol usually indicates ten to fourteen elements or vehicles [a company/ battery].

Unit symbols can also be displayed in "wire frame" or "NATO" style instead of as silhouettes. To change the plotting style of the symbols select the **Map/Change Unit Symbol Style** menu item or press the **F4** key.

5.5 Unit Tactical Disposition Symbols

(Exposed)

(Partial Cover or Defilade)

(Entrenched)

These symbols show a unit's tactical disposition as well as its facing or direction of movement. There are three tactical dispositions in TacOps - exposed, defilade/partial cover, and entrenched. An exposed unit is more vulnerable to fire and is visible at a greater distance than a unit in defilade. A unit is exposed when it is moving or when it is stationary and has not taken the time to locate a defilade or covered position. In TacOps defilade merely means that a unit has conceptually expended some portion of its turn (roughly fifteen to thirty seconds) in selecting the best position in its immediate vicinity. The assumption is made that a unit can always find some nearby spot that will improve its situation. For an infantry unit, defilade is synonymous with assuming a prone position or finding low cover. For a vehicle, defilade could represent taking advantage of slight differences in elevation, a nearby depression, rubble, vegetation, etc. to reduce its exposure. An entrenched unit is inside a system of field fortifications consisting of foxholes, trenches, and or perhaps a few bunkers.

5.6 Orders Symbols
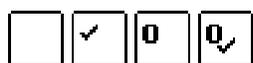
Orders symbols may optionally be shown during the orders phase. These symbols help you remember which units have been recently examined (i.e. had their orders window opened) and which units have pending orders. A blank symbol means that the unit has no orders and has not been examined during the current orders phase. A check mark in the symbol indicates that the unit has been examined. An "O" in the symbol shows that the unit has unexecuted orders.

5.7 Unit Photos

The unit data base in TacOps can be directly accessed for information on all units and photographs for most units. The photograph data base can be accessed from the menu lists or from the keyboard. Select the **Reports/Photo Data Base** menu item. Photographs are contained in the support folder named "zPhotos". If the photograph feature does not seem to be working, make sure that these files are located at the same directory level as TacOps. **Shortcut** – Right click on a unit symbol or hold down the Ctrl key while clicking on a unit symbol. Select "Info" from the popup menu. A unit information window with a photo will be displayed.

6. Giving Orders To Units

Units must be given instructions during the orders phase in order to move or change their tactical disposition during the combat phase. Orders are given to units by clicking on buttons and icons in the **Unit Orders Window** and by clicking on the map. A unit may be given multiple orders during the orders phase. Some orders take effect immediately, others are delayed until an appropriate time in the combat phase. Delayed orders are automatically stored in the unit's computer record in the same sequence as given by the commander. During the combat phase, the unit will attempt to execute each order in its proper sequence. The **Unit Order**s **Window** also provides unit information and access to other unit options.

Shortcut. Some of the features most commonly used while giving orders to units are also available from a handy unit popup menu. To summon the unit popup menu, right click on a unit symbol or hold down the Ctrl key while clicking on a unit symbol.

6.1 Unit Orders Window

To give orders to a unit, click on its symbol to open the **Unit Orders Window**.

Movement orders are also given while the **Unit Orders Window** is on screen, however the player gives movement orders by clicking on the map and not by clicking inside the **Unit Orders Window**. To order a unit to proceed to a certain point on the map, click one time on the map at that point. (one order will be stored but the actual movement will not take place until the combat phase). If the **Unit Orders Window** obscures the point that you wish to click on, drag the window out of the way. Clicks inside the **Unit Orders Window** will not register as movement orders.

As movement orders are given, way points will be drawn on the map for each order. Intermediate way points are drawn as arrows pointing to the next way point. The last way point is a small circle.

There is a cyclic control in the upper left corner of the **Unit Orders Window** which determines if a unit will move to a newly clicked way point in forward gear or in reverse gear. Moving in reverse gear is useful for withdrawing a unit while keeping its front toward the enemy. If the cyclic control displays the word "Forward" when a movement way point is added, the unit will move to that way point in forward gear. If the cyclic control displays the word "Reverse" when a movement way point is added, the unit will move to that way point in reverse gear.

Shortcut. Holding down the Shift key while clicking on the map will also cause the unit to move to the clicked way point in reverse gear.

Any unit will exit the map and be removed from play if it is located within 100 meters (ten pixels) of any edge of the map at the end of any movement and combat phase.

Each unit can have a maximum of 20 stored orders. This allows you to provide fairly sophisticated route and disposition instructions for each unit. An error sound will be heard if you try to enter more than 20 orders and the extra orders will be ignored.

Stored orders may be canceled during the orders phase by clicking on the button with a "-" in it. One click deletes the last stored order, two clicks deletes the last two stored orders, etc. Pressing the "-" key on the keyboard will also delete one order. One click on the adjacent "X" button or touching the "x" key on the keyboard will delete all stored orders for that unit.

Non-movement orders are given using the buttons and icons inside the window. Generally, you give one order each time you click once on a button or icon. The icon will usually blink or appear to depress to acknowledge the order. The buttons and icons inside the box labeled **"Delayed Orders Controls"** give others that will not be executed until the Combat Phase. Most other buttons and icons in the window produce some instant and usually observable action during the Orders Phase

When you have finished giving orders to a unit you can close its **Unit Orders Window** by clicking in a close box in the title area, or by pressing the Enter/Return key, the Escape key, or [Windows] Control + W, or [Macintosh] Command + W. **Note**: Any of these methods can usually be used to close most TacOps windows or dialogs.

Shortcut. You can also close an orders window by double clicking on the next unit that you want to give orders - the orders window of the newly selected unit will open automatically. There is a tradeoff for this convenience. You may occasionally pick up unwanted move orders if your double click is too slow or a bit irregular. If this happens, it will be obvious and it is easily corrected by just deleting the unwanted order with the "-" or "X" buttons.

6.2 Delayed Unit Orders Controls

⊛	Wait 15 seconds.
↰	Change facing counterclockwise 45 degrees.
↱	Change facing counterclockwise 45 degrees.
▶	Change tactical disposition to exposed.
⬇	Helicopter down one level.
⬆	Helicopter up one level.
⬌	Helicopter to land.
）	Seek cover or enter an entrenchment.
⬚	Indicates that a unit is inside an entrenchment
Ⓛ	Load personnel into APC or helicopter.
Ⓤ	Unload personnel. from APC or helicopter.
SG	Fire smoke grenade.

The buttons in the "**Delayed Orders Controls**" box in the **Unit Orders Window** give orders that will not be executed until the next combat phase.

The **Seek Cover** button (often called the defilade button) in the **Unit Orders Window** will order a unit to enter an entrenchment only if the center point of the unit marker is over an entrenchment map symbol. To get the benefit of the entrenchment, the center point of a unit must be somewhere within the entrenchment symbol and you must have previously ordered the unit to "enter" the entrenchment by clicking on the **Seek Cover** button. It is not enough for a unit marker to just be on top of an entrenchment symbol.

6.3 Instant Unit Orders Controls

The controls outside the "**Delayed Orders Controls**" box in the **Unit Orders Window** usually give orders that will be executed immediately.

The **Fire Control** box shows and adjusts a unit's current engagement range limit between zero meters and the maximum useful range of its longest reaching weapon. Unit will not fire at any target to which the range is greater than what is set in this control, unless fired on first. Use the thumb control in the slider to make major adjustments. Clicking in the slider to the left or right of the thumb control will change the range limit by 1000 meters. Clicking in the left or right slider arrows will change the range limit by 100 meters. Click on the "0" index to set the range limit to zero. Click on the "2500" index to set the range limit to maximum. You can also select the number in the box under the slider and set the range limit with the keyboard - press return/enter after typing the number. The small "?" button in the upper right corner of the **Fire Control** box displays one or two rings on the map to show the range of the longest ranged weapon in the unit as well as the unit's

current target engagement range limit (if it is different from maximum range). Hold the mouse button down after clicking on this button. Note that a unit can have a maximum range so large that its range ring may be off your screen. If the unit's current target engagement range has been set to zero a small square with an "X" will be shown on the unit symbol. Pressing the **all** button in the lower right corner of the **Fire Control** box will set every unit in your force to the engagement range limit shown in the adjacent number box. If the number is a greater range than a particular unit can reach, that unit will be set to whatever its maximum range is.

 The **LOS** button allows you to check the normal line-of-sight and the range in meters from the current selected unit to a point on the map and displays the terrain type and the UTM coordinates of the end point. The start point for the check will be the approximate center of the currently selected unit symbol. The cross hair cursor will be clear if there is a clear line of sight between the unit and the center of the cursor. If the cursor fills with black, then the line of sight is blocked. If the cursor turns gray then there is a clear line of sight but the range is greater than the maximum allowed visibility. If the selected unit has thermal sights the routine will automatically show the unit's thermal line of sight.

Shortcut. Click on the 'All' button to set every unit in your force to the same engagement range limit as is shown in the Fire Control box. If the number is a greater range than a particular unit can reach, that unit will be set to whatever its maximum range is.

 The **Orders box** shows and adjusts the delayed orders status of a unit - its unexecuted movement orders, facing changes, mode changes, and the like. The number shown on the left side of the box shows the number of unexecuted orders in the unit's orders list. The "-" button deletes the last order in the unit's orders list with each click. The "X" button deletes all orders in the unit's orders list with one click. The "?" button in the upper right corner of the Orders box displays times next to each way point in the unit's future movement path. Hold the mouse button down after clicking on this button. The time indicates the approximate minutes and seconds that will be required for the unit to move from its present position to that way point. The time shown may prove to be somewhat inaccurate - generally too low - if the unit is or becomes suppressed.

Shortcut. Pressing the "X" key when a **Unit Orders Window** is open will delete all orders for that unit.

Shortcut. Pressing the "-" key when a **Unit Orders Window** is open will delete the last order for that unit.

 Specify default behavior for a unit. See **Unit SOP Window** section for more detail.

 Replaces the orders of the unit with the open **Unit Orders Window** with orders obtained from another unit elsewhere on the map. This is very useful for organizing a group of units to move in column down a road. To use, click on the button. The

orders window will disappear and a cross hair cursor will appear. Click the cross hair cursor on another unit on the map. The orders window will reappear and the orders of the clicked on unit will replace the original unit's orders.

Add Orders   Gets the orders queue from another unit on the map and append those orders onto the end of the orders queue for the unit with the open **Unit Orders Window**. This is also very useful for organizing a group of units to move in column down a road. To use, click on the button. The orders window will disappear and a cross hair cursor will appear. Click the cross hair cursor on another unit on the map. The orders window will reappear and the orders of the clicked on unit will be appended to the end of the original unit's orders queue

Rules of Engagement

Select rules of engagement.

vs Blue	
vs Red	▶ Free Fire
vs Green	▶ Self Defense
vs Gray	▶ Self Defense
vs Ivory	▶ Self Defense
vs Orange	▶ Self Defense
vs Gold	▶ Self Defense
vs Yellow	▶ Self Defense

Cancel   OK

Sets the rules of engagement for one unit marker to either free fire or self defense. If a unit marker vs color interaction button in the list shown is set to "**Free Fire**" then the unit will engage markers of that color at any opportunity. If a unit marker vs color interaction is set to "**Self Defense**" then the unit will engage markers of that color only after being attacked. **Note**: This feature is seldom used outside of a multiplayer teams, network game.

Unit   Indicates if a specific enemy unit has been set as a priority target for the unit whose **Unit Orders Window** is open. The small circle is both an indicator light and a button. If the indicator light is green, the unit has no priority target. If the indicator light is yellow, the unit has a low priority target. If the indicator light is red, the unit has a high priority target. Clicking on the indicator light will open the **Priority Targeting Window**. [See later section on setting priority targets for an explanation of low and high priority orders.]

DFTRP   Indicates if a point on the map has been set as a DF TRP (Direct Fire Target Reference Point) for the unit whose **Unit Orders Window** is open. A DF TRP focuses a unit's attention on a specified area of the map. The small circle is both an indicator light and a button. If the indicator light is green, the unit has no DF TRP. If the indicator light is yellow, the unit has a low priority DF TRP. If the indicator light is red, the unit has a high priority DF TRP. Clicking on the indicator light will open the **Priority Targeting Window**.

Type   Indicates if a specific type of enemy unit has been set as a priority target type for the unit whose **Unit Orders Window** is open, for example, any T80 tank unit. The small circle is both an indicator light and a button. If the indicator light is green, the unit has no priority target type. If the indicator light is yellow, the unit has a low priority target type. If the indicator

light is red, the unit has a high priority target type. Clicking on the indicator light will open the **Priority Targeting Window**.

| Info | Show information about the unit. See later section for more detail. |

| Demo | Demonstrates unit orders. |

| Load | Load personnel instantly into a collocated vehicle or helicopter. |

| Unload | Unload personnel instantly from a vehicle or helicopter. |

| Tow | Begin towing an artillery piece or a damaged vehicle. |

| Release | Stop towing an artillery piece or a damaged vehicle. |

| Split | Split unit into smaller units. |

| Join | Join two similar units into one unit. |

| Supply | Increase unit's ammunition supply. |

| Name Unit | Allows the player to assign optional text names to the unit markers. For example: A Co, 1st Bn.
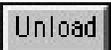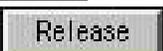
6.4 Unusual Unit Orders Controls

The following buttons are only found in the **Unit Orders Window** of a few specialized units. All issue delayed orders that will not be executed until a later combat/movement phase.

| Build Minefield | Create a minefield marker. |

| Breach Obstacle | Clear a lane through an obstacle marker. |

| Deploy Bridge | Emplace a vehicle launched bridge. |

| Recover Bridge | Recover a vehicle launched bridge. |

| Launch Line Charge | Fire an explosive line charge across a minefield or an obstacle.
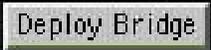
6.5 Unit SOP Window

The **Unit SOP Window** (Standard Operating Procedures) allows you to specify default behavior for a unit. This window is summoned by clicking on the SOP button in a **Unit Orders Window**. Clicking on most buttons in the window will mark SOP settings to be observed by the selected unit. The SOP settings are not final for the selected unit until (1) the window is closed or (2) the Set All Ground Units button is clicked. Some buttons shown below are not available to some units.

Allow Fire Support On Own Position. Normally your artillery and air support will not strike a point on or very near friendly units. This can make it difficult to engage nearby enemy units. If this item is checked, your artillery and air units will ignore safety limits when firing at a target on or near this friendly unit. Note: if you have several units stacked in or near a proposed artillery or air target, every friendly unit on or near that target must have this SOP item marked in order for artillery and air units to ignore safety limits in that area.

Cross Minefields At Normal Speed. A unit will normally try to go around a known mine field unless there is a cleared lane through it. If you want a unit to cross an uncleared minefield at full speed check this item. When a unit crosses a minefield at normal speed it is attempting to "bull through" the field and is very likely to suffer significant casualties.

Cross Minefields At Breaching Speed. Check this item if you want a unit to cross an uncleared minefield slowly and carefully - marking or clearing a lane as it goes.

Normally a unit will automatically attempt to go around a minefield unless there is a cleared lane through it. However, a ground unit can be ordered to cross a minefield - at either normal speed or at breaching speed. To order a unit to enter and cross a known minefield check mark either the "**Cross Minefields At Normal Speed**" box or the "**Cross Minefields At Breaching Speed**" box in the **Unit SOP Window** and then give the unit way point orders that cross the minefield. Any ground unit can choose to cross a minefield at normal speed or at breaching speed. If a unit crosses an unbreached minefield marker at normal speed then the unit is "bulling through" the minefield and can expect a fast but very costly experience. Breaching a minefield by "bulling through" could cost 7 to 10 vehicles per 100 meters. If a unit crosses a minefield marker at breaching speed then the crossing will be very slow and the unit will probably take few if any casualties.

Stop If Fired On. If checked, a moving unit will stop in place if fired on. The unit will also attempt to adopt a defilade mode. Helicopters will drop to nap-of-the-earth altitude and will hover.

Stop If Fired On & Pop Smoke. If checked, a moving unit will stop in place if fired on. If suitably equipped, the unit will instantly produce a local smoke screen. The unit will also attempt to adopt a defilade mode.

Reverse If Fired On. If checked, a moving unit will instantly begin to back up if fired on. Helicopters will drop to nap-of-the-earth altitude. The unit will continue moving in reverse until it traverses the number of meters specified in the adjacent distance box.

Reverse If Fired On & Pop Smoke. If checked, a moving unit will instantly begin to back up if fired on. If suitably equipped, the unit will instantly produce a local smoke screen. The unit will continue moving in reverse until it traverses the number of meters specified in the distance box.

Unload If Fired On. If checked, a unit will unload any troops onboard if fired on.

Stop After Firing. If checked, a moving unit will stop in place if it fires any of its weapons. The unit will also attempt to adopt a defilade mode. Helicopters will drop to nap-of-the-earth altitude and will hover.

Stop After Firing & Pop Smoke If checked, a moving unit will stop in place if it fires any of its weapons. If suitably equipped, the unit will instantly produce a local smoke screen. The unit will also attempt to adopt a defilade mode.

Reverse After Firing. If checked, a moving unit will instantly begin to back up if it fires any of its weapons. Helicopters will drop to nap-of-the-earth altitude. The unit will continue moving in reverse until it traverses the number of meters specified in the adjacent distance box.

Reverse After Firing & Pop Smoke. If checked, a moving unit will instantly begin to back up if it fires any of its weapons. If suitably equipped, the unit will instantly produce a local smoke screen. The unit will continue moving in reverse until it traverses the number of meters specified in the distance box.

Unload After Firing. If checked, a unit will unload any troops onboard if it fires any of its weapons.

The items under the labels "If fired on and hit" and "If spot enemy" work similarly.

Take Evasive Action When Fired On. Helicopter units (only) can be instructed to automatically move away from enemy fire by checking this item. If fired upon, the helicopter unit will usually assume a nap-of-the-earth flight profile and will move directly away from the source of the fire.

Set All Ground Units. Clicking on this button will instantly paste the settings in the SOP Window into every one of your other ground units.

Clear. Clicking on this button will clear all settings in the SOP Window.

Copy. Clicking on this button will copy all settings in the SOP Window into memory. The **Orders/Paste SOP** menu item can then be used to later paste these settings into other units.

Note 1: These routines are meant to be used on an exceptional basis. Most were added primarily to address critical realism problems related to units continuing to foolishly advance into surprise enemy fire for too long a period of time before the next orders phase occurs. The program does not analyze the situation before acting on SOP settings, it just executes them as you ordered.

Note 2: If an SOP option includes smoke and it is acted on, smoke will not be fired if a unit is out of smoke ammunition or is still in the process of reloading its smoke devices from a previous firing.

Note 3: The unload SOP settings may be combined with other settings. If marked, the unit will unload before honoring any other SOP settings.

6.6 Supply Unit Button and Supply Window

The **Supply Unit** button in the **Unit Orders Window** summons a window that may allow you to replace expended ammunition.
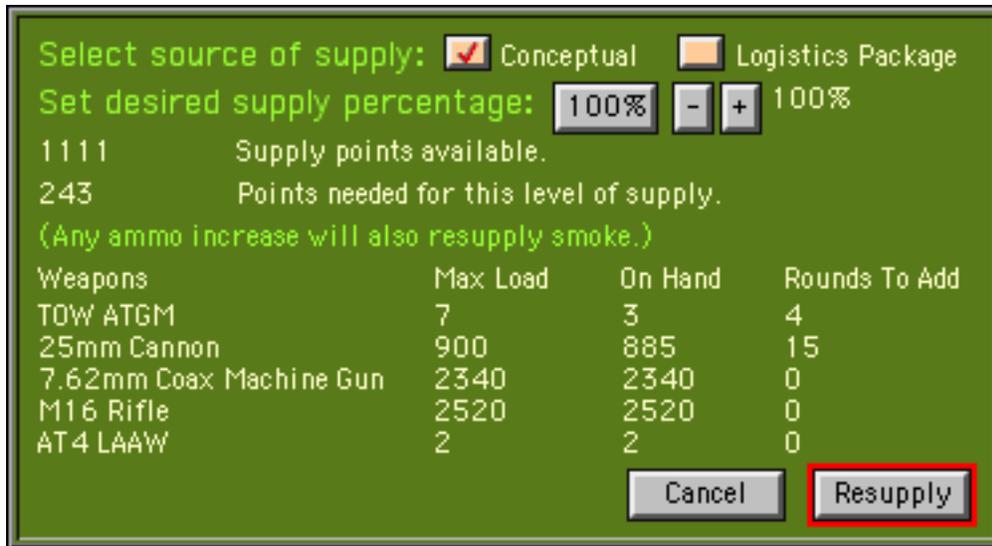
Choose the source of resupply by check marking either the **Conceptual Button** or the **Logistics Package Button**. Conceptual resupply is drawn from the force supply points as defined by the scenario. Logistics package resupply is drawn from a Logistics Package marker located on the map. If the Logistics Package Button is selected, the user will also be asked to select a Logistics Package marker from the map that is located within 200 meters of the unit.

Next set the desired percentage of the unit's maximum ammunition load using the $\ominus$ $\oplus$ buttons at the top of the resupply window or click on the 100 % button to skip straight to 100%. The window shows how many rounds you have and how many must be added to meet the percentage goal and whether you have enough supply points left to allow the resupply. To complete the resupply, click the **Resupply** button.

6.7 Information Windows
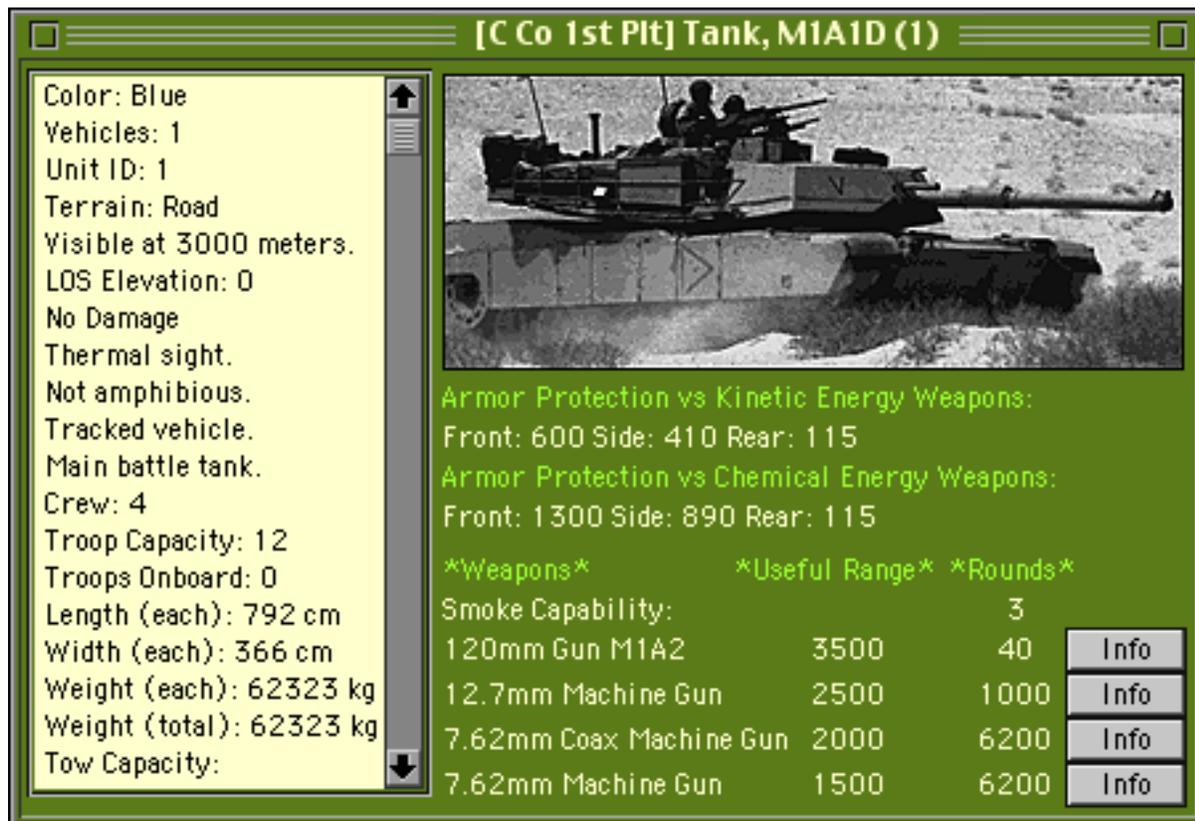
When a **Unit Orders Window** is open, detailed information about the unit may be obtained by clicking on the **Unit Info** button. This will produce an **Information Window**.

The title of the **Information Window** shows the units type, its optional text name if any, and its map location in UTM coordinates. The body of the window shows items such as a unit's strength, disposition, damage, special capabilities, armor protection, as well as its weapons and their characteristics. If the unit is capable of transporting personnel, its capacity and current loading will be shown. A unit ID number is shown that indicates the unit's position in the list of units for one side. (The unit ID number does not indicate chain-of-command or organization.) The visibility, elevation, and terrain items are very useful for confirming that the unit is where it appears to be and is receiving the perceived terrain benefits. The battle map does not always exactly portray the terrain data base - critical unit positions should be confirmed. A unit's weapon systems are listed with their maximum effective range and the amount of ammunition remaining for each weapon. In TacOps, effective range is the maximum useful range of a weapon and is not necessarily its theoretical maximum range. In TacOps, the hit chance of a weapon firing at its effective or maximum useful range will usually be much lower than the fifty percent standard that is often used in military references.   In TacOps, weapons will never fire beyond their useful range.

The **Information Window** shows a unit's basic level of armor protection on its front, sides, and rear against kinetic energy weapons (solid penetrator and fragmentation rounds) and chemical

energy weapons (high explosive shaped charge rounds). Some units (i.e. those with high tech armor) have different armor protection levels against chemical energy weapons than against kinetic energy weapons. The number expresses the protection level in millimeters of EHRSA (Equivalent Homogeneous Rolled Steel Armor - i.e. standard steel armor) and may not represent the actual armor thickness of the armor material at all. For example, aluminum armor will have a EHRSA number much lower than its actual thickness. High tech non metallic armors and armor coverings will have an EHRSA number much higher than their actual thickness. The EHRSA number also includes average armor slope, if any. **Note:** The estimates for Armor thickness and EHRSA in TacOps are notional values that are solely the opinion of the game developer. The values were estimated based on open source literature and then adjusted to meet the mathematical and probability computation needs of the game engine. Military technical assistance in the production of some versions of TacOps does not in any way imply official confirmation of these values.

Pressing one of the **Info** buttons on the right side of the **Information Window** will produce a window showing more detailed information about the capabilities of the adjacent weapon.

```
┌─────────────────── 120mm Gun M1A2 ───────────────────┐
│                                                       │
│  Minimum Range: 0      Useful Range: 3500             │
│  Antiarmor Effect: Kinetic energy.                    │
│  Advanced penetrator                                  │
│  Range Reference Points:  0m    1000m  1500m  2000m  2500m  3500m │
│  Basic Hit Probability:   95%    90%    80%    70%    50%    15%  │
│  Armor Penetration:      680mm  670mm  660mm  640mm  620mm  580mm │
│  Note: All info is for direct fire only. Multi mode weapons have different range and ph │
│   for indirect and  AA fire.                          │
└───────────────────────────────────────────────────────┘
```

The hit probability shown in the **Weapon Information** Window expresses the likelihood of the weapon hitting a tank or infantry squad sized target, with an initial round or burst of rounds, before any modifiers for terrain and situation have been assessed. Units will often be unable achieve these probabilities. On occasion, they may exceed them. Hit probability in TacOps is calculated to the nearest meter of range. The hit probabilities and armor penetration values shown in the window are only reference points. If range-to-target falls between two reference points, the probability and penetration values used in resolving the fire will be extrapolated to new values that will be accurate to the nearest meter of range. In other words, the hit probability changes fractionally every meter past a given range/probability reference point. Similarly, armor penetration is also calculated to the nearest meter of range. Weapon armor penetration is also expressed in millimeters of EHRSA. **Note:** The estimates for range, hit probabilities, and armor penetration in TacOps are notional values that are solely the opinion of the game developer. The values were estimated based on open source literature and then adjusted to meet the mathematical and probability computation needs of the game engine. Military technical assistance in the production of some versions of TacOps does not in any way imply official confirmation of these values.

7. Movement

Units move during the combat phase according to their orders. Movement speed is affected by terrain, and the suppressive effect of enemy fire. Movement is fastest on a road, less in clear terrain, much less in rough terrain, and slowest in woods. [Currently, TacOps woods are relatively light woods and do not usually prevent movement by any vehicle.] Effective enemy fire may reduce a unit's movement speed. The effect is not so much that the unit has actually reduced its speed of movement. Rather the speed decrease represents that the unit is most likely not moving in a smooth motion, or in a straight line anymore as it attempts to avoid further fire, maneuvers for cover, readies itself to return fire, executes short firing halts, etc.

All units have the same opportunity to move, roughly simultaneously, in one scale-second increments. In other words, every unit is checked every scale-second to see if it qualifies to move at least one screen pixel - about ten meters. If the unit qualifies for movement, its position will change.

Only aircraft and fully amphibious vehicles may move across water. Infantry units on foot are not considered amphibious for game purposes. Infantry units that are unloaded into water from amphibious vehicles or from helicopters are instantly removed from play.

8. Ground Combat

Combat is decided by the computer after a comparison of the characteristics and tactical disposition of the firing and target units. The combat result is influenced by a variety of factors to include:

Firer - weapon effectiveness at different ranges
Firer - recent suppression
Firer - number of rounds fired at same target
Firer - armor penetration effectiveness
Firer - speed of travel of the round
Target - armor protection effectiveness
Target - terrain
Target - visibility
Target - amount of target exposed to fire
Target - angle at which fire strikes - front, side, or rear
Target - tactical disposition
Both - surprising nature of fire
Both - unit personnel and equipment strength
Both- stationary or moving, combat friction, fog-of-war, other random unpredictable events

Note: factors are not presented in any particular order of priority or weight.

Although units may appear sometimes to fire in turn, the results of direct fire are generally not final until all units of both forces have had an opportunity to fire during the same fifteen second fire pulse. Thus a unit apparently destroyed may continue firing briefly. Air and artillery indirect fire take effect immediately as they occur - normally in the movement pulse. The simulation considers the relatively slow speed of some anti tank missiles, so their impact may sometimes be delayed until the next movement pulse if the range is such that the missile can not reach the target within ten or fifteen seconds.

8.1 Direct Fire

Direct fire is flat trajectory fire delivered at a target usually visible to the firer. Direct fire is the only fire possible for most ground units. Direct fire requires that a target unit be close enough to the firer to be recognized, that a clear line of sight exist from the firing unit to the target, and that the target be within range of at least one of the firing unit's weapons. Units will generally automatically engage the nearest enemy unit in sight with direct fire from every weapon having the potential of destroying or suppressing the target. However, a unit whose main weapon is primarily an anti-armor weapon will often ignore infantry targets in preference for more distant enemy armored targets or ATGMs unless the infantry unit is very close. In other words, units will usually select the most threatening enemy unit in sight. Even if all conditions for direct fire are met, a given unit may not always fire. This simulates the real-world fact that units are not perfectly prepared or capable at all times.

8.2 Controlling Unit Direct Fire

In TacOps, you are a unit commander, not a gunner. Your control of a unit's direct fire is limited to positioning your units with movement and disposition orders, setting a maximum engagement range, and designating priority targets.

You can order an individual unit to refrain from firing until a target comes within a designated range. The **Unit Orders Window** contains a box labeled **Fire Control** which contains controls that can be used to set a maximum engagement limit for a unit. The unit will not routinely fire at an enemy unit that is farther away than this setting unless fired on first. A unit will always automatically reset its engagement range to maximum if it is fired on effectively by an enemy unit.

You can set priority targets and a priority area of fire for a unit by using the buttons in the **Unit Orders Window** labeled **Unit**, **Type**, and **DF TRP**. These buttons open the **Priority Targeting Window**. The **Priority Targeting Window** contains three groups of controls that are used to set each type of priority target.

The buttons in the **Priority Targeting Window** are also indicator lights. Green or gray indicates that the button is not set, yellow indicates that the button is set with a low priority order, and a red light indicates that the button is set with a high priority order. A low priority order does not stop a unit's search for other targets if the priority can not be met. A high priority order does stop a unit's target search if the priority can not be met.

The **Target Unit** control group lets you select a specific enemy unit as a priority target for the unit whose orders window is open. During subsequent fire pulses, the unit will first check to see if it has a decent fire resolution against this priority target unit. If it has any chance against its priority target unit it will probably take the shot. If not, and if the priority is a low priority order, it will automatically search for another target.

The **DF TRP** control group allows you to designate a point on the map as a Direct Fire Target Reference Point for the unit whose orders window is open and to specify its active radius. A unit with a DF TRP will place a priority on engaging targets that are located within the radius of the DF TRP. Overuse of this capability can slow the combat phase greatly. If the pace of the combat phase becomes unsatisfying, you should consider clearing any unneeded DF TRPs.

The **Target Type** control group lets you select a type of enemy unit as a priority target for the unit whose orders window is open. The unit will place a priority on engaging targets of the specified type. Overuse of this capability can slow the combat phase greatly. If the pace of the combat phase becomes unsatisfying, you should consider clearing any unneeded target type priorities.

The colored buttons in the **Priority Targeting Window** for "Target Unit" also provide information when clicked on. If a unit has a priority target unit and you click on the yellow or red buttons in the **Target Unit** control group, the enemy unit that is the priority target will flash briefly - if it is currently visible on the map.

When the **Priority Targeting Window** is first opened, if the unit has a **DF TRP** the radius of the DF TRP will be displayed on the map as a red ring around the DF TRP marker.

A priority targeting order (unit, type, or DF TRP) can be a limit as well as a priority. A low priority targeting order is only a priority, it does not forbid a unit from firing at a different target if the priority can not be fulfilled. If a low priority targeting order is given and it cannot be fulfilled exactly, then the unit will continue searching for other targets and it is allowed to select an alternate target - one outside the priority settings. A high priority targeting order creates a hard limit - it forbids a unit from firing at a different target if the priority can not be fulfilled. If a high priority targeting order is given and it cannot be fulfilled exactly, then the unit will usually stop searching for targets and will usually not fire on anything. To give a low or high priority targeting order, click on the appropriate target priority button.

During the fire pulse any priority orders set by these buttons are evaluated in the same sequence as the left to right position of the buttons in the **Unit Orders Window** - first to be considered is priority unit, then DF TRP, and finally priority target type. None, one, two, or all three of the priority targeting buttons may be used, in any combination of low and high priorities. If you intend to use more than one of these priority buttons at a time it is critical that you remember that a unit's search for targets will be done in the following order - by priority unit if any, then by DF TRP if any, then by priority unit type if any, and finally by any unit. Low priority orders that cannot be fulfilled will not stop the search. Anytime a high priority order can not be fulfilled, the search will stop. Three examples follow.

Example 1. An M1 tank unit has been given a low priority unit target - a T80 Tank Company with unit id 23, a low priority DF TRP with a radius of 500 meters, and a low priority target type of BMP2 IFVs. During the fire pulse the unit begins searching for targets. It first tries to find unit 23, but unit 23 has moved behind a hill and there is no line of sight - the initial search fails. However, since the priority unit order was a low priority order, the M1 tank unit starts a new search. This time, the M1 tank unit is searching for targets within 500 meters of its DF TRP and since it has a priority target type order for BMP2s it will first search specifically for BMP2s within 500 meters of its DF TRP. There are no BMP2s within 500 meters of its DF TRP - the second search fails. Because the target type is a low priority order, the M1 tank unit will start a third search. It will repeat the search within 500 meters of its DF TRP, but this time it will accept any reasonable target that it finds within 500 meters of its DF TRP. There is no target of any kind within 500 meters of the DF TRP - the search fails. Because the DF TRP priority is a low priority order, the M1 tank unit will start a fourth search based on looking for any BMP2 at any range. There are no BMP2s to be found at any range. The M1 tank unit will then make a fifth and last search for any target at any range. The M1 tank unit finds an infantry squad at 1000 meters, fires on it, and the fire pulse moves on to the next friendly unit.

Example 2. An M1 tank unit has been given a high priority unit target - T80 Tank Company with unit id 23, a high priority DF TRP with a radius of 500 meters, and a high priority target type of BMP2 IFVs. During the fire pulse the unit begins searching for targets. It first tries to find unit 23, but unit 23 has moved behind a hill and there is no line of sight - the initial search fails. Because the priority unit target was a high priority order, the M1 tank unit will usually search no

more during this fire pulse and will usually not fire at any target. To repeat, because the priority unit target was a high priority order, he M1 tank unit will not check the DF TRP nor the priority target type of BMP2 IFVs. The fire pulse moves on to the next friendly unit.

Example 3. An M1 tank unit has been given a low priority unit target - T80 Tank Company with unit id 23, the unit has no DF TRP priority, but it has a high priority target type of BMP2 IFVs. During the fire pulse the unit begins searching for targets. It first tries to find unit 23, but unit 23 has moved behind a hill and there is no line of sight - the initial search fails. Since the priority unit order was a low priority order, the M1 tank unit starts a new search. As it has no orders to search based on a DF TRP, the M1 tank unit skips to a search based on a priority target type of BMP2s. A BMP2 is found at 1000 meters range and another is found at 2000 meters. The M1 will almost always select the closer target, so it fires on the BMP2 at 1000 meters. The fire pulse moves on to the next friendly unit.

8.3 Indirect Fire

Indirect fire is high trajectory fire delivered at a target which may or may not be visible to the firer. Only artillery or mortar units may use indirect fire. Indirect fire attacks every unit within its burst radius. If a unit symbol in the impact area represents three vehicles or three squads, then every subunit will be attacked. If there are several units or symbols in the impact area, all will be attacked. Target selection and firing for indirect fire is not automatic. You must plot indirect fire during the orders phase using the **Artillery Support Window** or an on map unit's indirect fire control link to this window (see later paragraphs for detailed information about off map and on map artillery support).

8.4 Mines

Some scenarios offer minefields in the basic setup or as optional units. These minefields are placed and may be repositioned during the first orders turn just like units. An umpire may place a minefield at any time by using the **Options/Engineering** menu item. At the beginning of the following combat phase, newly placed minefields will be automatically converted into permanent terrain features. Hand laid minefields may usually only be placed within designated startup areas. Artillery laid minefields may usually be placed anywhere on the map. Some units are able to lay mines during the game.

All minefields contain both antipersonnel and antiarmor mines. The area covered by each minefield equals exactly the area and shape of its symbol. Friendly units are at risk if they enter their own minefield. If the fog-of-war option is in use, some minefields may be hidden from enemy view until neared or entered by an enemy unit. Other minefields may be visible for some distance.

Once a minefield is spotted, a player can learn useful information about it by right clicking on its marker or by holding down the Ctrl key while clicking on its marker. The amount of information provided varies according to the nature of the minefield. This information may assist the player in deciding if the minefield can be breached in the time available and if so how many and what types of units would be best to use.

As a unit moves through a minefield, a lane is automatically created along its path. The lane may be viewed by selecting the **"Map/Plot Minefield Lanes"** menu item - lanes will then be plotted on the map in light green. This lane is intentionally about five times wider than it should be. The lane is oversized in the game because if the marked path was narrower then the player would not be able to easily see it and would not be able to reliably click on it when he later needed to give movement orders to units to follow the path. A lane marking does not always indicate that the lane is completely free of mines (see later information on the mine clearing line charge). Subsequent units that traverse this lane will do so at half speed.

Normally a unit will automatically attempt to go around a minefield unless there is a cleared lane through it. However, a ground unit can be ordered to cross a minefield - at either normal speed or at breaching speed. To order a unit to enter and cross a known minefield check mark either the "**Cross Minefields At Normal Speed**" box or the "**Cross Minefields At Breaching Speed**" box in the **Unit SOP Window** and then give the unit way point orders that cross the minefield. Any ground unit can choose to cross a minefield at normal speed or at breaching speed. If a unit crosses an unbreached minefield marker at normal speed then the unit is "bulling through" the minefield and can expect a fast but very costly experience. Breaching a minefield by "bulling through" could cost 7 to 10 tanks - mostly mobility kills). If a unit crosses a minefield marker at breaching speed then the crossing will be very slow and the unit will probably take few if any casualties.

Some units can breach a minefield better and or faster than others. Dismounted engineers are faster and more effective than dismounted infantry. Vehicles with mine rollers or mine plows are faster and better than vehicles with excavation blades or no blade at all. Vehicles armed with a mine clearing line charge (MICLIC) breach very quickly but a line charge is not guaranteed to clear all mines with a single firing. When the MICLIC is fired at a minefield, an abstracted path will be created through the center of the minefield that is 5 pixels wide (50 meters). A MICLIC lane is not guaranteed to be free of mines. The MICLIC will clear a random 75 to 100 per cent of the active mines along the path. The actual level of clearance will not be revealed to the player. If more certainty is desired by the player then he will need to fire a second line charge and or proof the path by pushing a blade, plow, or roller vehicle across it.

See the section titled "Scenario Editing and Umpire Tools" for more information on creating minefields.

See the section titled "Special Units, Special Capabilities" for more information on breaching minefields.

8.5 Obstacles

Obstacle markers retard or prevent movement across an area . Obstacles may be optionally added to a scenario in the setup turn (or in any turn by an umpire) by using the **Options/Engineering** menu item. There are five types of obstacle in TacOps: ditch, ditch + wire, barricade, barricade + wire, or wire only. Obstacles may have a different counter mobility effect

on tracked vehicles, wheeled vehicles, or dismounted infantry. Different obstacles may require different breaching methods.

Once an obstacle is spotted, a player can learn useful information about it by right clicking on its marker or by holding down the Ctrl key while clicking on its marker. This information should assist the player in deciding if the obstacle can be crossed or breached in the time available and if so how many and what types of units would be best to use.

Some units can breach an obstacle better and or faster than others. Dismounted engineers are faster and more effective than dismounted infantry. Engineer vehicles are faster and better than tanks with excavation blades. Vehicles armed with a mine clearing line charge can breach wire very quickly but usually have little effect on ditches or barricades.

Not all units can breach obstacles. If a unit has a game relevant breaching capability, a button labeled **Breach Obstacle** will be included in the delayed orders button group of the **Unit Orders Window**. To order a unit to breach an obstacle do the following. Open the **Unit Orders Window**. Order the unit to move adjacent to an obstacle marker. Click on the **Breach Obstacle** button and then click on the obstacle marker. In subsequent movement and combat turns the unit will move to the edge of the marker and then begin contributing its labor to breaching the obstacle. The unit will remain stationary alongside the obstacle marker until enough time and labor has been expended to breach the obstacle. It may take many turns for one unit or a collection of units to contribute enough labor to effect the complete breaching of the obstacle. Once the obstacle is completely breached its marker will change and it can then be crossed by any unit.

See the section titled "Scenario Editing and Umpire Tools" for more information on creating obstacles.

See the section titled "Special Units, Special Capabilities" for more information on breaching obstacles.

8.6 Entrenchments

An entrenchment marker represents a complex of moderately fortified fighting positions covering an area of 110 x 110 meters. A unit that has entered an entrenchment is significantly more resistant to casualties from direct and indirect fire.

Some scenarios offer entrenchments in the basic setup or as optional units. These entrenchments are placed and may be repositioned during the first orders turn just like units. An umpire may place an entrenchment at any time by using the **Options/Engineering** menu item. At the beginning of the following combat phase, newly placed entrenchments will be automatically converted into permanent terrain features.

8.7 Bridges

There are three types of bridges in TacOps - pre version 4 permanent bridges, version 4 semi-permanent bridges, and version 4 vehicle launched bridges. The older permanent bridge type is a permanent map feature of a particular scenario and can not be repositioned or removed. The semi-permanent bridge type can be optionally added during the setup turn or added or removed in any orders phase by an umpire by using the **Options/Engineering** menu item. The vehicle launched bridge can be deployed or recovered in any movement and combat phase by certain special unit types.

When the semi-permanent bridge is created it is assigned one of the following Military Load Classifications (MLC): 10, 20, 30, 40, 50, 60, 70, 80, 90, or 100+. Bridges with a MLC of 100+ can support any weight. Bridges of MLC 10 through 90 are represented with a round yellow marker containing the MLC number in black. Bridges with a MLC of 100+ are represented with a round yellow marker containing an "infinity" symbol. A vehicular unit marker can not cross a bridge if the bridge's MLC is less than the weight in metric tons of one vehicle from the marker. The speed with which a unit marker can cross a bridge is adjusted according to the number of vehicles in the marker. The more vehicles in the marker, the longer it will take for the marker to cross the bridge. This abstraction represents the general need for military vehicles to cross a bridge in single file and at intervals so as to not exceed the weight capacity of the bridge.

Placement of a bridge marker converts an area measuring 150x150 meters into bridge terrain. This technically unrealistic size is a necessary abstraction to enable the player to (a) easily visually locate bridges on the map and (b) easily and quickly mark a movement path across a bridge. If bridges were portrayed accurately they would only measure one or two pixels in width and would be very difficult to find and work with during game play.

See the section titled "Special Units, Special Capabilities" for more information on vehicle launched bridges.

8.8 Helicopter Landing Zones

An LZ marker enables a helicopter to land, load, and unload in normally prohibitive woods and town terrain. An LZ marker provides no additional advantage in terrain that is not woods or town. LZs are represented with a round brown marker containing the characters "LZ" in black. Placement of an LZ icon marks an area measuring 150x150 meters as an LZ but does not otherwise change the nature of the terrain for ground movement, spotting, or combat. The location of a helicopter landing zone (LZ) marker is not revealed to player colors different from its builder/owner until an opposing color marker moves into clear line of sight of the LZ.

Helicopter landing zones can be optionally added during the setup turn or added or removed in any orders phase by an umpire by using the **Options/Engineering** menu item.

9. Air Combat

Air combat includes air to air, air to ground, and ground to air engagements. The focus of TacOps is ground combat. Air support operations are represented in a more conceptual fashion than ground operations. (see Designer's Notes)

9.1 Air Versus Air Combat

If an enemy helicopter unit is visible within 1000 meters of an arriving fixed wing air strike, the air unit will usually choose to attack the enemy helicopter rather than its ground target. If the helicopter unit is armed with air to air missiles, it may fire as the fixed wing air strike arrives.

Helicopters attack other helicopters with direct fire in the same fashion as they attack ground units.

9.2 Air Versus Ground Combat

Fixed wing air support missions will automatically attack the nearest enemy ground unit found within 500 meters of the air mission target point. Ground units in range may fire on the aircraft if armed with unsuppressed antiair weapons. If the antiair fire is effective the aircraft may be destroyed, or the air strike may abort without effect (an A will be shown), or the air strike may hit its target with reduced effect (an H will be shown), or the air strike may drop its ordnance and miss its intended target completely.

Helicopters and ground units fight each other with direct fire, in the same fashion as ground to ground combat.

10. Artillery And Air Support

Off map artillery and air forces are usually available to support on map combat. The amount available will vary by scenario. Air and artillery support are not portrayed in the same detail as ground combat (see Designer's Notes).

Target symbols are displayed on the map for all ongoing fire support missions when the following windows are open: **Artillery Support Window**, **Air Support Window**, or the **Orders Window** of an on map artillery or mortar unit.

Shortcut. hold down the Alt key while clicking on the target marker for an off map artillery or air support mission and the control window for that mission will open automatically.

Shortcut. hold down the Alt key while clicking on the target marker for an on map artillery or mortar unit and the **Artillery Support Window** for the firing unit will open automatically. When the **Artillery Support Window** is closed, the orders window for that unit will then be opened automatically.

10.1 Off Map Artillery Support

To call for off map artillery support, use the **Orders/Artillery Support** menu item to present the window shown below. The maximum number of possible fire missions per turn is shown by the number of fire mission names in the window.
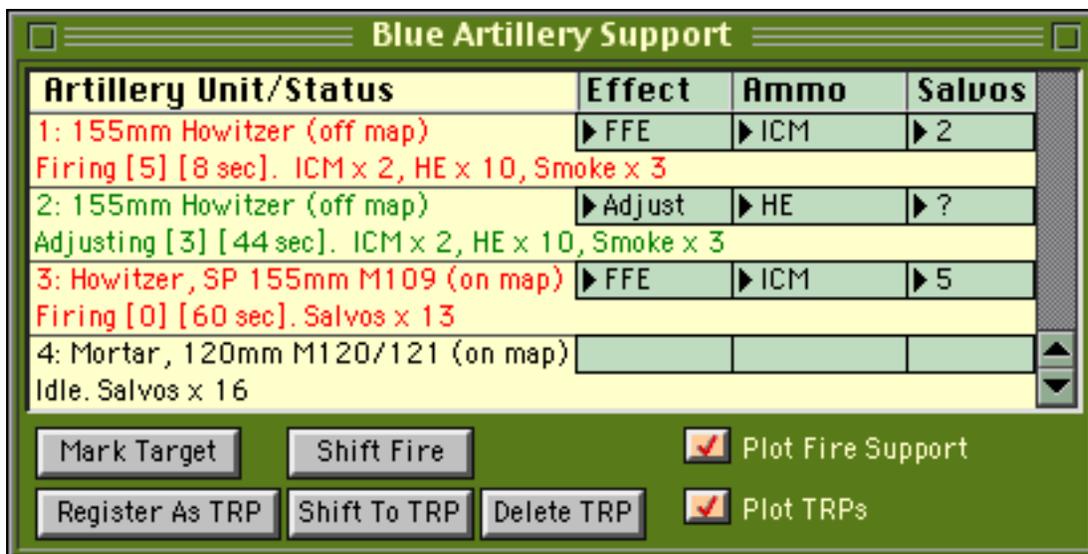
If a fire mission is already underway, the fire mission name will end with two numbers in brackets. The first number shows the accumulated accuracy of the mission. The second number indicates the minutes or seconds until the impact of the first or next volley. It is unlikely that a mission's first volley will impact exactly on the aiming point. The likelihood of subsequent volleys impacting closer to or on the aiming point increases automatically with each volley if a

friendly unit (an observer) has a clear line of sight to the aiming point. Accuracy will diminish with each volley that is not observed. The maximum possible level of accuracy is five; the minimum is zero.

To initiate or change a fire mission, first select the fire mission name on the appropriate line. Then, use the buttons inside the **Artillery Support Window** to designate a new target, to cease fire, adjust an aiming point, select/change method of fire, select/change ammunition to be fired, or to register an ongoing fire mission as a Target Reference Point.

To initiate a new fire mission, select the **Mark Target** button. The **Artillery Support Window** will temporarily vanish and a cross hair cursor will appear. Click on the map where you want the fire mission to impact. An artillery target symbol will appear on the map and the **Artillery Support Window** will return. This fire mission is now underway. The first volley will usually impact in one to three scale minutes. Subsequent volleys will usually impact at thirty to sixty scale second intervals.
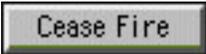
To cancel an ongoing fire mission, select the **Cease Fire** button. The selected mission will be canceled and its target symbol will disappear. Note that the next time this fire mission is activated, initial accuracy will again be zero and there will be a one to three minute delay before the first volley.

To shift the aiming point of an ongoing fire mission to a nearby target, select the **Shift Fire** button. The **Artillery Support Window** will temporarily vanish, a circle will be drawn on the map around the current target and a cross hair cursor will appear. Clicking on the map within the circle will change the aiming point of the fire mission to that spot. Shifting an ongoing fire mission drops accuracy one level and may add a minor delay to the next volley but it is usually preferable to ceasing fire and calling for a new mission. You may shift an artillery mission 1000 meters per turn.

The map is temporarily cleared of artillery and air support markers while you mark or shift a fire mission so that you are better able to see target units and terrain. Sometimes one wants to see the other fire support symbols while targeting.

Shortcut. If you want to prevent the temporary clearing of artillery and air support markers, hold down the Alt key as you select the "**Mark Target**" or the "**Shift Fire**" buttons.

In TacOps a fire mission can be either fire for effect or adjusting fire. Fire for effect is used to cause damage. Adjusting fire is used to improve accuracy without expending significant amounts of ammunition. Each force has a limited amount of off map artillery ammunition. The amount available per game is measured in volleys. Selecting the **FFE** (Fire for Effect) setting in the **Effect** cyclic control causes the firing of a full volley at the target and costs one volley of ammunition per impact. Fire for effect will improve accuracy if observed, and may damage or destroy the target. Selecting the **Adjust** (Adjusting Fire) setting in the **Effect** cyclic control causes the firing of only one round at the target and does not cost a volley of ammunition. Adjusting fire will improve accuracy if observed, but will not cause any damage to the target.

When an off map artillery mission has fired enough adjusting rounds for its accuracy level to reach level 5, additional adjusting impacts will not be displayed on the map.

The type of ammunition to be fired is selected by selecting the **HE**, **ICM** or **Smoke** setting in the **Ammo** cyclic control. The number of volleys of ammunition remaining for each type of ammunition is shown by the numbers to the right of the button. HE (high explosive) is effective against personnel and lightly armored vehicles and will occasionally damage heavily armored vehicles. HE is relatively inexpensive and is usually readily available. ICM (improved conventional munition) is far more effective against almost all types of targets than HE but ICM is a very expensive and popular ammunition. Accordingly, there may often only be a limited supply of ICM available. Smoke is used for screening units. Artillery smoke will remain on the map for eight to ten minutes.

The **Salvos** cyclic control sets the number of salvos that will be fired. If the control displays a question mark "?"then the artillery mission will be fired until it is canceled by the player or the unit runs out of ammunition. The other available settings are zero through five salvos.

Use the **Plot Fire Support, Plot TRPs, Register As TRP, Delete TRP, Shift Fire,** and **Shift To TRP** buttons within the window to turn on/off fire mission symbol plotting, to register a target, to delete a registered target, or to shift fire to a previously registered target.

Plot Fire Support. Checking this item causes all ongoing fire mission targets to be plotted on the map. Sometimes previously set target symbols get in the way of marking a new target. Unchecking this item will hide the fire mission symbols so that you can easily see what is underneath.

Plot TRPs. Checking this item causes all ongoing artillery target reference points to be plotted on the map. Unchecking this item will hide them.

Register As TRP. Select this button to save the aiming point and current accuracy of an underway fire mission as a artillery target reference point (TRP). Subsequent canceling or shifting of the fire mission will not disturb the saved or registered target information in the TRP. Registered target points are marked with a smaller symbol than ongoing fire missions. If a registered target point coincides with the aiming point of an ongoing fire mission, you might not be able to see the symbol for the registered target point until you cease the ongoing fire mission. A target can not be registered until its accuracy reaches at least level three.

Shift to TRP. Select this button to set or shift a fire mission to a preregistered artillery target reference point. The original aiming point and mission accuracy will be restored but a delay may be assessed before the first volley.

Delete TRP. Select this button and then click on an artillery target reference point to delete that point.

10.2 On Map Artillery Support

On map mortar and artillery units can use both direct and indirect fire. Direct fire for on map mortar or artillery units is handled automatically by the computer as with any other unit. If indirect fire is desired, click on the indirect fire button in the lower left corner the **Unit Orders Window.** This will open the Artillery Support Window with the appropriate fire mission control group already selected and highlighted for the on map artillery or mortar unit.

Adjusting fire costs one round per impact for on map artillery and mortars. When an on map artillery/mortar unit has fired enough adjusting rounds for its accuracy level to reach level 5, additional adjusting impacts will not be displayed on the map. On map units can not use TRPs set by off map units.

Shortcut. the program temporarily hides all fire support mission markers when marking or shifting "on map" artillery or mortar targets. If you do not want the markers to be temporarily hidden, you can prevent this by holding down the Alt key as you click on the Mark or Shift Target buttons.

10.3 Artillery Target Reference Points

Artillery target reference points (TRPs) are points on the map where artillery and mortar fire has been preregistered. TRPs usually provide faster response to calls for fire and increased accuracy for the first volley. Artillery TRPs can be created during game play or a block of them may be provided for setup at the beginning of a game. To use an artillery TRP, open the **Artillery Support Window**, select an ongoing fire mission or mark a new target, and then shift the fire mission to the TRP using the **Shift To TRP** button (see previous section). Off map artillery units can not use TRPs set by on map units. On map artillery units can not use TRPs set by off map units

Artillery TRPs are created during a game by using the **Register As TRP** button in the **Artillery Support Window** or in the **Unit Orders Window**. Selecting this item for an ongoing fire support mission will record the aiming point and current accuracy level of that fire mission and will display an artillery TRP marker. The TRP marker and its companion record will be maintained even if the fire mission is canceled. A target can not be registered until its accuracy reaches at least level three.

Some scenarios provide a block of special artillery TRPs that can be placed on the map during initial unit setup. Such TRPs provide faster response and initial accuracy for your off amp artillery - place them carefully. These TRPs will appear in the **Setup Window** as gray squares with a cross hair in the center. During the Setup Phase, artillery TRP markers work much the same as unit markers and they may be placed anywhere on the map. As long as the **Setup Window** is active, target points may be repositioned simply by clicking on them. Once the **Setup Window** is dismissed, you need to hold down the shift key as you click on the marker in order to reposition it. At the beginning of the first combat phase, artillery TRP markers will "stick" to the map and from then on they behave the same as target points registered using the artillery support dialog. If during the setup turn you don't want to use all the target point markers that may be provided in a setup window, you can delete them individually using the **Options/Delete Units** menu item.

Artillery TRPs can be deleted during a game, after the setup turn, by using the **Delete TRP** menu item in the **Artillery Support Window**. You might want to do this to reduce screen clutter.

10.4 Air Support

To call for air support, use the **Orders/Air Support** menu item to present the window shown below. Currently available air support missions are listed in the window.

Each listing describes an air mission's current status. If an air support mission is underway the status line will state that the mission is enroute and will give the minutes until arrival at the target. If an air support mission is available but is not currently tasked, the status line will show how long it will take the aircraft to arrive if called.

When it is time for an air support mission to arrive at the target the computer will check the target area. If there is a helicopter unit within 1000 meters of the target point the air support mission will switch its attack to the helicopter unit - the air support mission may or may not become available again. Otherwise, If there are enemy ground units within 500 meters of the target point the aircraft will attack the closest unit to the target point. If the aircraft is shot down by enemy fire or releases its bombs, the air support mission will no longer be available. If there is no enemy ground unit within 500 meters of the target point or the air strike is effectively engaged by ground fire, the air strike will be aborted and the air support mission may or may not become available again.

To initiate or change an air support mission, first select the appropriate line by clicking on the mission name. Then, use the buttons in the window to designate a new target, adjust an existing target point, or to abort an enroute air mission.

To initiate a new air support mission, select the **Mark Target** button. The **Air Support Window** will temporarily vanish and a cross hair cursor will appear. Click on the map where you want the air strike. An air target symbol will appear on the map and the **Air Support Window** will return. This air support mission is now underway. The air strike will arrive over the target in about the time shown in the appropriate air mission status line in the **Air Support Window**.

To cancel an enroute air mission, select the **Abort Mission** button. The selected mission will be canceled and its target symbol will disappear.

To shift the aiming point of an enroute air mission to a different target, select the **Shift Target** button. The **Air Support Window** will temporarily vanish, a circle will be drawn on the map around the current target symbol and a cross hair cursor will appear. Clicking on the map within the circle will change the aiming point of the air mission to that spot. You may shift an air mission target 1500 meters per turn.

Use the **Plot Fire Support** and **Plot TRPs** buttons to turn on/off target symbol plotting.

11. Combat Effects

11.1 Effect Symbols

Effective direct fire, indirect fire, mine explosions, artillery strikes, and air strikes usually produce secondary explosions and or display symbols over the target to indicate the level of effect.

H   = hit or super-near-miss.

S   = unit suppressed.

[skull symbol] = one or more infantry casualties, but unit not totally eliminated.

D   = mobility or weapon damage.

[red symbol] = one vehicle destroyed or severely damaged.

E   = unit totally eliminated.

A   = air strike aborted on final run.

If a symbol or a secondary explosion is not displayed over a visible target then there probably was no effect on the target. Effects include vehicle destruction, vehicle damage, weapon damage, personnel loss, and suppression. Suppression represents a momentary loss of maximum straight line speed and or combat efficiency resulting from such things as surprise, fear, confusion, reduced visibility, looking for more cover, looking for the firing enemy, looking for a better firing position, tending to wounded, fighting fires, paralysis of analysis, etc. The effects of suppression may last for several scale minutes.

Effect symbols on unspotted friendly units will not be shown to the enemy player if the fog-of-war option is turned on and the affected unit is not legally visible; secondary explosions and wreck markers will always be shown.

11.2 Effects On Infantry Units

Infantry units may sustain permanent casualties and or be suppressed. Permanent casualties are indicated by the display of a skull symbol. Suppression is indicated by an S symbol. Suppression may also be assumed when the skull symbol is seen. Suppressed infantry units immediately go to ground, lose all orders, have difficulty spotting, have a greatly reduced chance of firing, and fire with reduced accuracy. Exposed infantry antitank weapons are especially affected by suppression. Permanent casualties to an infantry unit cause suppression, reduce the number of personnel in the unit, and at some point will cause the unit to drop one organizational level and or be eliminated.

11.3 Effects On Vehicles

A secondary explosion will be shown if a vehicle in a unit is destroyed or severely damaged. If a vehicle is destroyed, a wreck marker will be drawn. Surviving members of the unit are automatically suppressed. Other units that are extremely close to the destroyed vehicle may also be suppressed. A secondary explosion and a "D" will be displayed if a vehicle sustains weapon or mobility damage but is not destroyed. Other members of the unit are automatically suppressed. Other units that are extremely close to the damaged vehicle may also be suppressed. A hit that does not destroy or damage will display an "H," and the unit is suppressed. If the unit is suppressed by a super-near miss, an artillery impact, or an air strike, an "S" will be displayed. Suppressed vehicle units advance slower, have difficulty spotting, have a reduced chance of firing protected weapons, have a greatly reduced chance of firing exposed weapons, and fire with reduced accuracy. If a vehicular unit has only one vehicle and a vehicle is destroyed then that unit will be eliminated. If a unit has several vehicles, the unit's strength will be reduced by one and the unit's ammunition supply will be reduced accordingly.

11.4 Effects On Vehicles With Troops

If a vehicle is destroyed while carrying infantry, all or some of the infantry aboard that vehicle may also be destroyed. If the unit has surviving vehicles and if there is room aboard them, surviving infantry will be automatically transferred to the surviving vehicles. If there is not room, excess infantry will be placed on the map, on foot, and will be suppressed. Infantry carried inside an armored vehicle are protected and will not be affected by direct fire, artillery, or air strike unless their vehicle is destroyed or damaged. Infantry carried on a tank are exposed and may be affected at any time by direct fire, artillery, or air strike.

12. Unit Disposition

A unit's effectiveness in attack and defense may vary according to its facing, tactical disposition and terrain situation.

12.1 Tactical Disposition

There are three tactical dispositions or modes in TacOps: exposed, defilade/partial cover, and entrenched. Exposed mode indicates a unit that has not taken advantage of the best cover and concealment available nearby. Usually this indicates that the unit is moving or about to move. Defilade/partial cover mode indicates that the unit is largely motionless and has taken the time to find some local cover or concealment that reduces its exposure to fire. It does not mean that an armored vehicle has found a perfect hull down position or that an infantry unit has "dug in".

A unit is in entrenched mode if it enters an entrenchment symbol. All entrenched units are significantly harder to spot. All entrenched units are significantly harder to hit with direct fire. Entrenched infantry units suffer less personnel casualties when they are hit. Entrenchments can hold an infinite number of units. (There is no need to have the game enforce stacking limits. Your opponent's artillery will generally drive the lesson home about not bunching up.)

12.2 Terrain Effects

Units are easier or harder to see and hit according to the terrain they are in. TacOps visibility and combat is heavily influenced by the terrain. Visibility/sighting and the likelihood of being hit by direct fire decline according to terrain in the following order: clear, rough, woods, town, rough plus woods.

12.3 Facing

Most armored units are more vulnerable to fire to their side than to their front and most in peril to their rear. The same also usually applies to infantry in defilade/partial cover or in entrenchments. Defilade/partial cover and entrenchment offer their greatest protection to fire from the front, less to fire from the side, and little or none from fire from the rear. Maneuver and positions for firing units that provide side and rear shots against target units will definitely be rewarded. Some weapons can only defeat some targets by side or rear attacks.

13. Ending The Game

A TacOps game officially ends when the scenario time limit expires or when certain scenario unique victory conditions are met. At this time the **Game Status Report** will state which force has achieved its mission. Victory goes to the force that accomplishes its assigned mission. TacOps does not force you to stop playing a scenario once it is technically over. You may continue playing simply by continuing to give orders to your units. The program may or it may not continue to check victory conditions during such extended play. It depends on the scenario's victory conditions.

The program does not adjudicate levels of victory - you either accomplish your mission or you don't. Experienced players, particularly in two player games, may want to embellish this a bit by setting personal goals to go along with mission accomplishment. In real life, accomplishing your mission while losing 90 per cent of your command would probably not be considered much of an achievement. The **Game Status Report** provides sufficient information to allow you to compare your performance from game to game. In particular you can use your overall casualty percentage and your attrition point score as yardsticks. Attrition points are a measure of the damage that you have done to the enemy. Each unit in the game has a lethality value. When you destroy an enemy squad, team, or vehicle its lethality value is added to your attrition point score. If you accomplish a given mission with a comparatively low casualty rate and a comparatively high attrition score then you have done well.

14. Game Options And Preferences

TacOps allows the user to modify many aspects of the game system. The **Options** menu items provide many user selectable options. Judicious use of these items will allow you to tailor the TacOps game engine as well as most scenarios to better support your personal gaming interests and your view of reality in some controversial areas.

14.1 Game Preferences

Preferences are additional options available through the **Preferences** item in the **Options** menu. Some game preferences are used to modify a currently loaded scenario. Some preferences, when changed, will carry over to any future game played. Most however, will only apply to the current game session. The permanent and temporary settings are clearly indicated in the **Preferences Window**.
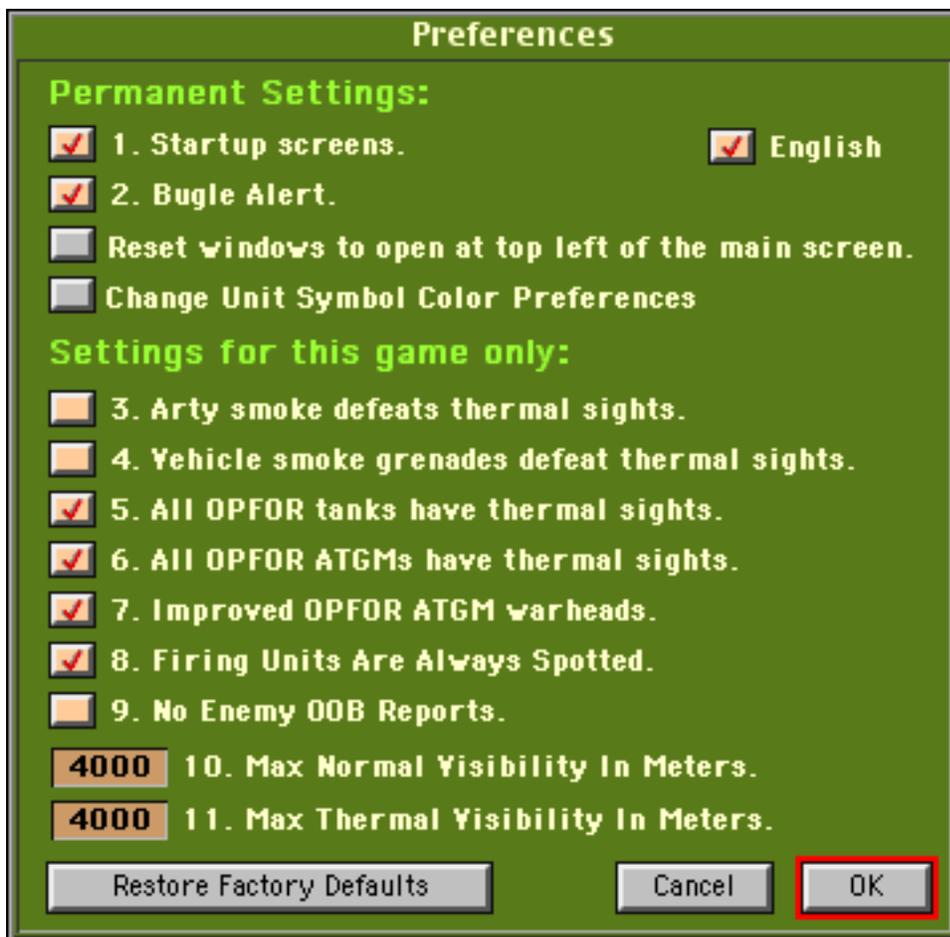
For the most part, preference items are provided to allow you to influence the game's play balance, or to allow you a choice in areas of still unfolding research and development, fielding of new capabilities, and or controversy. TacOps has two primary goals - to provide gaming entertainment and to realistically simulate contemporary tactical combat. The two goals are not always compatible. Some equipment capabilities if possessed by only one side in a game will

result in one player commanding a super force that can not be beaten when properly employed. If your primary gaming goal is entertainment, use the factory default preferences to even things up a bit. If your primary gaming goal is realism, then use the preferences to configure your view of current reality as newer equipment becomes available or as new information on existing equipment becomes available. In general, the factory defaults provide a fairly even game but they tend to give OPFOR greater capability than currently exists in the real world.

Unchecking preference items one and two will permanently disable the startup splash screens and the bugle alert sound effect. Changes to these items will effect the current game session and they will carry forward to any new game session.

Normally the program will draw a particular window at the last location where the user chose to display it. If the user drags a window to a new screen position, the program will remember that window's new location when that window is next redrawn. Selecting the button labeled "Reset windows …" will cause the program to forget all previous window positions and to open new windows at the top left corner of the main monitor. This button is useful in the situation where a user has changed his monitor or multiple monitor configuration since the last TacOps game session and one or more TacOps windows are now hidden off the current screen.

The button labeled "Change Unit Symbol Color Preferences" will display a window from which the user can slightly change the colors of the unit markers. This feature may enable users with larger, sharper, or brighter monitors to use darker unit marker colors.   This feature may also provide some assistance to users who have difficulty recognizing certain colors.

The rest of the Preference items only effect the current game in progress. They will be retained if you save the current game session, but they will not effect any new game that you start.

14.2 Arty smoke Defeats Thermal Sights

Controls the effect on thermal imaging devices of artillery barrage smoke. If checked, thermal imaging devices will not be able to see through artillery or mortar delivered smoke. Such smoke is currently under development, but is not believed to have been yet fielded by any country.

14.3 Vehicle Smoke Grenades Defeat Thermal Sights

Controls the effect on thermal imaging devices of smoke instantly produced by smoke grenade launchers mounted on vehicles. Such smoke is currently under development, but a significantly effective product is not believed to have been yet fielded by any country.

14.4 All OPFOR Tanks Have Thermal Sights

Controls the presence of thermal imaging devices on OPFOR tanks. If checked, all OPFOR tanks will have such devices. If unchecked, only OPFOR tanks currently known to have thermals (few to none) will be so equipped. Thermal imaging technology is well within the development capability of OPFOR and such technology is readily available for purchase in the international arms market. To date the decision to not employ such technology has been primarily a financial one - thermal imaging devices are enormously expensive.

14.5 All OPFOR ATGMs Have Thermal Sights

Controls the presence of thermal imaging devices on OPFOR Anti-Tank Guided Missiles. If checked, all OPFOR ATGMs will have such devices. If unchecked, only OPFOR ATGMs currently known to have thermals (few to none) will be so equipped.

14.6 Improved OPFOR ATGM Warheads

Controls the presence of OPFOR weapons meeting current and near future "Western" standards. If checked, all OPFOR anti-tank guided missiles (ATGMs) will have greatly improved warheads. If unchecked, OPFOR ATGMs will be only marginally effective against the composite armor of the newer main battle tanks or against reactive armor. Recent developments in refining the shape and liner materials of the explosive charges used in ATGMs as well as the fitting of tandem warheads has restored much of the ability of the smaller ATGMs to penetrate modern composite armor and reactive armor. This technology is within the means of OPFOR to develop and field.

Note: OPFOR improved warheads are indicated in the game by adding an "i" to the weapon name - examples are the AT4i, AT5i, and AT6i. Use of the "i" in this way is unique to TacOps and does not match any known, current US/CA or OPFOR nomenclature conventions.

14.7 Firing Units Are Always Spotted

Controls the automatic spotting of firing units. If this item is checked, the position of hidden units (other than snipers) will almost always be revealed the first time they fire. If this item is not checked, a hidden unit may or may not be revealed the first time it fires. Unchecking this preference adds significant realism to TacOps play, but it may be disconcerting to some gamers.

14.8 No enemy OOB Reports

If this item is checked, the enemy order of battle will not appear in the **Game Status** and **Order of Battle** items in the **Reports** menu.

14.9 Max Normal Visibility In Meters

Controls the distance at which units may be spotted without special thermal or radar imaging equipment.

14.10 Max Thermal Visibility In Meters.

Controls the distance at which units may be spotted with special thermal or radar imaging equipment.

14.11 Game Options

Additional game options are available in the **Options** menu. Game options are used to modify a currently loaded scenario. Options "stick" to saved games but do not affect future new games of the same scenario. Most options can only be applied during the setup or first orders phase of a new game.

14.12 Change Combat Speed

Select the Options/Change Combat Speed menu item to alter the speed with which messages are displayed in the information window during the combat phase. Slowing or increasing the speed of message display has the useful side effect of slowing or increasing the overall speed of combat execution. The number in brackets, beside the menu item, indicates the current setting. Higher numbers are slower than lower. A setting of zero provides the fastest display of action in the combat phase. This option is always available.

14.13 Change Fog-Of-War

Select the Options/Change Fog-Of-War menu item to control the display of unspotted units on the enemy screen.
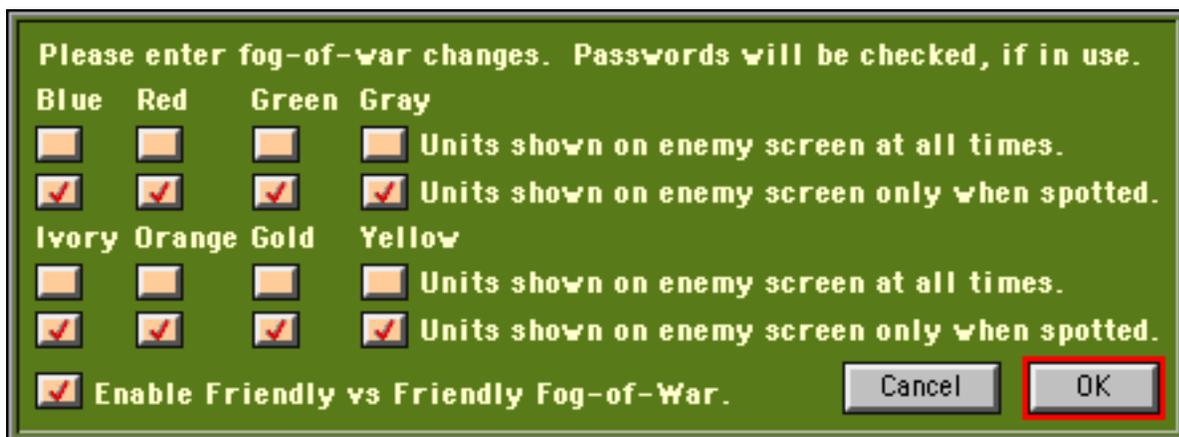
You may choose to have units displayed at all times or only when legally spotted. The fog of war setting does not effect program game logic or combat results in any way. The only thing that is

changed is the visual display of unspotted units. For example, the likelihood of combat occurring between units is not changed, nor is the accuracy or effectiveness of fire any different regardless of the fog of war setting. In solitaire games the computer opponent does not take advantage of this setting. The computer opponent always plays as if your unspotted units are not displayed, regardless of the fog of war setting. This option is available at any time.

14.14 Change Orders Time Limit

Select the Options/Change Orders Time Limit menu item to limit the time allowed to give orders to units during each orders phase. The player will be notified with an alert window when the timer expires. This option is available at any time after the first orders phase.

Set time limit for orders
(0 seconds to 10 minutes)...

| Off | 2 | Minutes | 0 | Seconds |

☐ Do Alert Only ☑ Begin Combat Phase

Cancel   OK
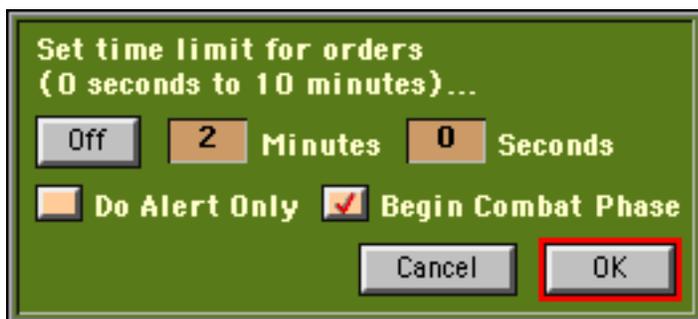
The umpire in a multiplayer teams game may choose to have the combat phase start automatically when the timer expires, rather than merely displaying an alert window, by check marking the box labeled "Begin Combat Phase".

14.15 Change Password

Select the Options/Change Password menu item to add or change an orders and unit visibility security password. This feature is most relevant to games played between two human opponents. This option is available at any time. IMPORTANT: Passwords should not begin with an asterisk (*) unless a game is being saved by an instructor for subsequent student use.

Instructor/student passwords. If the first character of the US/CA/blue force password is an asterisk (*) then that marks the saved game file as an instructor prepared saved game. Such a saved game file can be loaded and played by a student without the student having the password but all options relating to altering the game will still be password protected.

Warning: if you forget your password you will not be able to reload any saved game that uses it.

The remaining items in the Options menu are explained in Section 17, Menus.

15. Network Play

The most exciting and most realistic way to play TacOps is to connect two or more players on a network.

TacOps has two network play modes: "Two Player" and "Multiplayer Teams". It is very simple to begin a game in "Two Player " mode - once the players are successfully connected. - because the program is able to automatically handle almost everything. The "Multiplayer Teams" mode is much more complex, requires a good deal of pregame preparation from the host, and the host must actively supervise the beginning of the game session as well as act as an umpire throughout the conduct of later gameplay.

Both types of network game also allow nonplaying observers or spectators to join. Observers are allowed to see the markers of all game players at all times.

In order to play a game using networked computers, the computers must be already connected to a Local Area Network (LAN) and or to the Internet and must be capable of using the TCP/IP network protocol. Before running TacOps, do your normal procedures to log onto your network and or onto the Internet. If networking equipment and procedures are unfamiliar to you, your best option is to ask a friend for help in setting everything up. If that is not possible then consult the documentation that came with your LAN/Internet equipment, software, and account, or your LAN administrator, or your Internet service provider.

15.1 Two Player Network Game

It is a good idea to use the Basic Training scenario until you successfully get everything to work. Once you and your opponent have discovered the best way to connect and you have practiced the sequence with a few quick turns then you can restart and switch to a more complex scenario.

One of the players will be "the host" of the game session. The other player will "join" the game session. The host initially establishes the game network and then listens for the other player to join. Once the initial connection is made, there is no further special work for the host.

It is not unusual to have problems hosting during one's early attempts at LAN or Internet gaming. If you immediately find that you can not host a game session then ask your opponent to try to host and you try to join. If that fails then you will need to look to your Internet setup to see what is causing the problem. You may need to reconfigure or disable a software or hardware firewall if you are using one. If so then it will likely be useful for you to know that TacOps v4 uses TCP/IP port 7023. If you are using Microsoft Internet Connection Sharing, you may have to disable it or temporarily uninstall it. If you are on a LAN then you may need to discover what your real Internet address is and or you may need to remove your computer from the LAN and connect it directly to the Internet. It will work one way for some and another for others depending on their flavor of operating system, their type of LAN or Internet connection, and other system details and mysteries.

15.2 Two Player – Host Instructions.

Start TacOps. When the startup window appears ...
Select the check box for "Two Players - Network".
Select the check box for "Host Game".
Select the "Blue" or "Red" check box.
Click the OK button.
Select a scenario to play in the usual way.
Set up your units on the map.
Select the **Network/Log Onto Network** menu item.
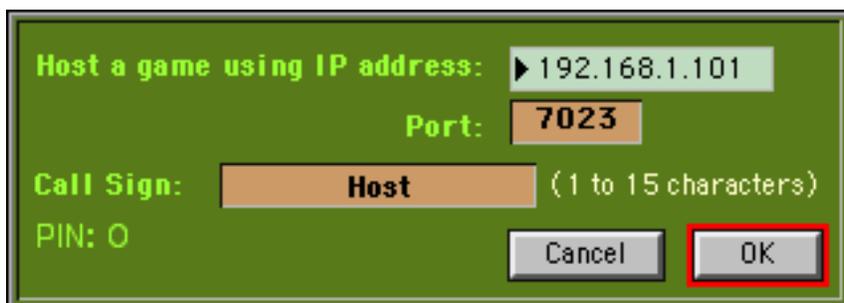
When the TacOps logon window appears, look in the upper right corner at the black box with a small green triangle and an IP address inside of it. If you are not on a LAN, then your current Internet IP address should be shown in that box. Click on the box several times to see if the address changes as you click. If it does change then copy down each different address. You may need to experiment to discover which of the addresses is the correct one. If you are on a LAN then you may instead be shown your LAN IP address (a LAN address usually starts with 192). If you are on a LAN then you will need to discover by other means what your real Internet IP address before you can proceed. Let your opponent know what your Internet IP address is. He has to know it in order to join the game session.

Enter the call sign that you want to use in the "Call Sign" box. Click the OK button. If all goes well, you will hear a sonar ping and you will see a message at the bottom of the screen that says "Listening for someone to join the TacOps network". If all does not go well then you will hear an error sound and you will get an error message in the information line at the bottom of the TacOps map window.

If all went well, you can now tell your opponent to try to join the game.

When your opponent tries to join the game, a joining alert window will appear on your computer asking if it is OK to let the person join the game. You will also be shown what force (Red or Blue) the joiner has chosen and his desired call sign. If the joiner has picked the wrong scenario or map or any of several other possible errors, these errors will be reported to you in the joining window. The program will confirm that both players are using the same version of TacOps and the same versions of the appropriate scenario and map files. Preferences will also be automatically checked at the beginning of the first orders exchange. If critical preference settings

do not agree on both computers, the program will automatically apply the host's preferences to both players. If everything looks OK, then click the OK button and let the person into the game.

If your attempt to host fails, open up the logon window again and click on top of the black IP address box that has a small green triangle in it. It is possible that after the click a different IP address will be shown to you. If this happens then click on the OK button with this new address showing and see if that allows a connection.

Once you and your opponent are connected, the game works almost exactly the same as if you were playing a solitaire game. You each give orders and when you each are finished with your orders you select the **Combat/Begin Combat** menu item. Once the host computer detects that both players have selected the "Combat/Begin Combat" menu item, the host computer will automatically cause an orders exchange to happen and if the orders exchange is successful then the host computer will automatically start a combat phase on both computers.

If there are problems after you establish a good connection, explore the options available to the host via the **Network/Status Report** menu item and the **Network/More Network Tools** menu item. Something there may help.

15.3 Two Player – Joiner Instructions.

Start TacOps. When the startup window appears ...
Select the check box for "Two Players - Network".
Select the check box for "Join Game".
Select the "Blue" or "Red" check box.
Click the OK button.
Select a scenario to play in the usual way.
Set up your units on the map.
Wait for instructions from the host player and then select the **Network/Log Onto Network** menu item.

When the logon window appears, enter the host's IP address into the four tan colored boxes in the upper right corner of the window. Do not enter any periods, just enter the four number groups that make up an IP address - one group in each box.

Enter the call sign that you want to use in the "Call Sign" box. Click the OK button.

If all goes well, you will hear a sonar ping and you will see a message at the bottom of the screen that says that you have connected to a TacOps network game. If all does not go well then you will get an error sound and message.

Once you and your opponent are connected, the game works almost exactly the same as if you were playing a solitaire game. You each give orders and when you each are finished with your orders you select the "Combat/Begin Combat" menu item. Once the host computer detects that both players have selected the "Combat/Begin Combat" menu item, the host computer will automatically cause an orders exchange to happen. Messages will appear in the info line at the bottom of the screen showing the progress of the orders exchange. If the orders exchange is successful then the host computer will automatically start a combat phase on both computers.

15.4 Multiplayer Teams Network Game

The multiplayer teams mode of play allows more than two players to participate in the same game via the Internet or a LAN. The technical limit on the number of players in the retail version of TacOps is 20 [200 in military versions]. The practical limit for Internet play is around 15 players. The practical limit for LAN play[in the military version is an unknown number significantly greater than 30. [At the time of this writing, 30 to 35 players on a LAN was the largest group that had been tried.]

One participant must serve as a neutral umpire. The umpire must be the network host. The umpire can not usually be a game player because he has perfect situational awareness - the normal fog of war rules do not apply to the umpire.

See **Appendix K - Multiplayer Teams Network Play** for more information

15.5 Network Chat

You may send text messages to the enemy commander by selecting the **Network/Send A Message** menu item. Avoid sending messages while the computers are exchanging orders. Sometimes your opponent may be doing something that is incompatible with receiving chat messages. If so you may not get an immediate response to a message but the message will be delivered as soon as the enemy commander starts a different activity.

15.6 Network Problems

Using the TacOps **Auto Save** feature is highly recommend for network play. If the **File/Auto Save** menu item is checked, the program will automatically save the game at the end of every Orders Phase using the file name, "Autosave". The save is triggered each time that the **Combat/Begin Combat** menu item is selected. Should you experience fatal network problems, you will usually be able to restart the game by using this file.

16. Play By Mail And Modem

TacOps can be played on two non-networked computers by exchanging orders files using floppy disks, or by using directly connected modems, or by using electronic mail to exchange orders files. The same basic procedure is used to exchange orders files by each method. For simplicity, all four methods are referred to as "Play-By-Mail".

In a play-by-mail game, when both players have finished giving orders to their units during the **Orders Phase**, they each save a special "orders file" to a disk and then they exchange those files by mail, by personal meeting, or electronically by direct connection or by email. Each player then loads the orders of his opponent and executes a **Combat Phase**. The orders exchange and combat execution cycle is then repeated.

The orders exchange process is simpler for you in practice than the description below suggests. The program will guide you to the next correct step in the orders exchange process. All you have to do is to look at the **Combat/Begin Combat** menu item, the **File/Receive Orders** menu item, and the **File/Send Orders** menu item. Only one of these menu items will be active at any given point, the other two will be dimmed. The one undimmed menu item indicates the next step in the process. To further aid you in identifying what file to load, the titles of the **File/Receive Orders** and the **File/Send Orders** menu items include the turn number of the orders file that needs to be loaded next. - example, "Send Orders #2".

Caution: When playing by mail or email, it is important that you coordinate in advance with your opponent to insure that you both have the same preference settings when you begin a game. If the preference settings of the two computers do not agree when the program loads an enemy orders files, you will be shown an alert dialog telling you what the differences are. If you are the Blue player the program will then change the incoming Red orders to match your preferences settings. If you are the Red player the program will then change your game preferences to the settings of the Blue player.

16.1 Play-by-Mail Procedure

Start the TacOps program in the usual way. When the **Startup Window** appears, select the **Two Players Play-By-Mail** item and also select whether you will command the Blue or the Red forces. Finally, select the appropriate item for playing either a standard scenario or a saved game. Click the **OK** button.

Setup your units in the usual way.

When you have finished giving orders to your units, select the **File/PBM Send Orders** menu item. You will be shown a standard file saving window. Accept the suggested file name or change it and then click the **OK** button to save your orders to disk (this file will be sent to your opponent - you will not need your own orders file again). Once you have written your orders to a disk file, the program will not allow you to give any more orders to your units, or to change the game preference or option parameters in any way. Do not try to defeat this. To do so would likely cause the subsequent Combat Phase to produce different results on the separate computers

and thus ruin your game in progress. You may only save orders once per orders phase from within the program. Immediately after your orders are written to disk you will be presented with another file save window - this time it will be to save your game in progress to disk. If the game session must be interrupted while awaiting receipt of your opponent's orders (i.e. you want to turn off your computer - the usual case), you should generally go ahead and accept this save opportunity and then refuse any subsequent offers to save the game as you quit the program. Following this suggestion guarantees that you will not inadvertently do something later that disrupts the consistency of the game on the two separate computers. You must preserve this saved game file. You will need it to restart the next game session if you quit TacOps.

Send just the orders file to your opponent. Do not send him your saved game file.

When you receive your opponent's orders file [if necessary, restart the TacOps program using your saved game file] use the **File/PBM Receive Orders** menu item to load your opponent's orders into the TacOps program. Be careful not to load your own orders, or a previous set of your opponent's orders. Preferences will be automatically checked. If critical preference settings do not agree on both computers corrective action will be taken or an error message will be displayed. The program will also confirm that both players are using the same version of TacOps and the same versions of the appropriate scenario and map files.

Execute the Combat Phase then repeat the orders phase, save orders, save game, orders exchange, and combat phase cycle until game completion.

This procedure will work for exchanging orders via mail, by personal meeting, or by using email.

To exchange orders by email you simply use your own communications program to transfer your orders file to some intermediate computer system - using Internet, or a local area network, or a local or national bulletin board system (BBS) - and to obtain your opponent's orders from same. If you wish to use email on a BBS to exchange orders, the BBS must be one that allows you to send non-text (sometimes called binary) files to other BBS users. The usual procedure is to "attach" the non-text file to a normal text post.

16.2 Play-by-Modem Procedure

To play TacOps modem to modem, you use your own communications program to establish and maintain the modem link with your opponent and to exchange the orders files saved by TacOps. This approach adds a few seconds and a couple of steps to play-by-modem in comparison to building a communications program into TacOps, but it offers three very great advantages. It insulates the game program from the all too frequent difficulties associated with modem use, it allows you to run your modem link with software that you are already familiar with and confident in, and it automatically creates files on disk that may be used to easily restart the game should you experience fatal communication problems.

You may choose to "stay on the phone" throughout the game or you may choose to connect with your opponent only when needed for exchanging orders. Either way, the best approach (if you

have the computer memory) is to run TacOps and your communications program at the same time and just switch back and forth.

Consult the documentation that came with your communication program to determine the best ways to use it to establish a modem to modem link and to upload/download non-text files (sometimes called binary files).

Start the TacOps program in the usual way. When the **Startup Window** appears, select the **Two Players Play-By-Mail** item and also select whether you will command the Blue or the **Red** forces. Finally, select the appropriate item for playing either a standard scenario or a saved game. Click the **OK** button.

Setup your units in the usual way.

When you have finished giving orders to your units, select the **File/PBM Send Orders** menu item. You will be shown a standard file saving window. Accept the suggested file name or change it and then click the **OK** button to save your orders to disk (this new file will be sent via modem to your opponent - you will not need your own orders file again though it would be a good idea to preserve it in case of future problems).Once you have written your orders to a disk file, the program will not allow you to give any more orders to your units, or to change the game preference or option parameters in any way. Do not try to defeat this. To do so would likely cause the subsequent Combat Phase to produce different results on the separate computers and thus ruin your game in progress. You may only save orders once per orders phase from within the program. Immediately after your orders are written to disk you will be presented with another file save window - this time it will be to save your game in progress to disk. As a precaution against modem communications failure during the orders exchange, you should generally go ahead and accept this save opportunity and then refuse any subsequent offers to save the game if you are forced to quit the program before the next orders exchange. Following this suggestion guarantees that you will be able to recover from any modem disaster and also that you will not inadvertently do something to the game that disrupts the consistency of the game on the two separate computers.

If you have not already done so, use your own communications program to establish a modem link with your opponent. In any case, switch from the TacOps program to your communications program.

Using your communications program, send the disk file containing your orders to your opponent. Do not send him your saved game file.

Using your communications program, obtain your opponent's orders file.

Switch back to the TacOps program.

Use the **File/PBM Receive Orders** menu item to load your opponent's orders into the TacOps program. Be careful not to load your own orders, or a previous set of your opponent's orders. Then execute the Combat Phase.

Repeat the orders phase, save orders, save game, orders exchange, and combat phase cycle until game completion.

Play-by-mail/modem generates a lot of disk files. TacOps does not willingly erase or overwrite old play-by-mail files. Technically you only need to preserve the most recent save game file. You can delete all previous orders files and saved game files at any time from outside the program. However, keeping them around guarantees that you and your opponent will always be able to restart your game at some earlier point despite any human or modem error. A game error induced by an unusual modem communications data transfer error might not be noticed for several turns.

Note: If the game session must be interrupted (i.e. you want to turn off your computer) between orders exchanges and you have not already just completed a save game as part of sending your orders, do use the Save Game menu item in the File Menu to save your game in progress before quitting the program. You must preserve this saved game file. You will need it when you start the next game session.

17. Menus

The following section gives abbreviated descriptions of what most menu items do. A fuller description is given for many menu items elsewhere in this guide.

17.1 The File Menu

About the Scenario

Provides information about each force's organization as well the scenario's mission and victory requirements.

New Game

Stops the current game and loads a new scenario without quitting the program.

Save Game

Saves the current game to disk.

Auto Save Last Turn

Causes the current game to be saved to disk automatically at the beginning of each combat phase. The current saved turn file will delete/replace the previously saved turn file. The file name used is "autosave.tac".

Auto Save All Turns

Causes the current game to be saved to disk automatically at the beginning of each combat phase without deleting or replacing the previously saved turn file. The file name used will include the turn number.

PBM Send Orders

Saves unit orders and game situation to a disk file for later transfer to a remote opponent during a play-by-mail or play-by-email game.

PBM Receive Orders

Loads an opponent's unit orders and game situation from a disk file during a play-by-mail game or play-by-email game.

Import Order of Battle

Note: The **Options/Enable Umpire Tools** menu item must be check marked in order for this menu item to be available. Loads a previously exported order of battle file for one force color. This feature (in combination with the Export Order of Battle feature) allows the user to extract and reuse unit markers from a scenario. The user can choose to import the units with their old map locations intact or he can choose to place them in a new deployment window for set up in new locations. The user can also extract unit markers from one scenario and map combination and transfer them to another combination. For example, the common situation where a standard order of battle is used on different maps for different exercises. With this feature, the user can build a particular order of battle one time and reuse it or share it with others – with or without minor modifications. This feature can also often be used to recover order of battle information from a saved game file that can no longer be loaded by a newer version of TacOps because of developmental changes to the game engine. In this case, the user would load the saved game file using the previous version of the game and then use the export feature to extract and save the order of battle information to a new file. The user would then run the newer version of TacOps and use the import feature to recover the information in the exported file.

Export Order of Battle

Note: The **Options/ Enable Umpire Tools** menu item must be check marked in order for this menu item to be available. Extracts and saves the current order of battle information (unit markers) for one force color to a disk file. The information is saved in a simplified format that is more likely to survive future developmental changes to the game engine. Changes that often make it impossible for a new version of TacOps to load saved game files from an older version. The export feature saves the information in an Excel compatible spreadsheet format (tab delimited). The exported file contains the following information for each unit marker in play of a given color: type code, strength, facing, map location in x/y screen coordinates, transportation status, player identification number (PIN) if any, and optional text name if any. These data fields were chosen because they are unlikely to change in the future and because they provide the minimum information necessary to reconstruct the most labor intensive parts of a user designed scenario. With care, the user can also edit the exported OOB file using Microsoft Excel so long as he carefully observes the data conventions and saves the edited file in a tab delimited format.

Quit

Closes TacOps and returns to the desktop.

17.2 The Combat Menu

Begin Combat Phase

Ends the current orders phase and starts the combat phase.

Begin Combat w Options

Ends the current orders phase and enables the umpire of a multiplayer teams game to (1) force the immediate start and display of a movement and combat phase on all computers with or without first collecting orders from the players or (2) to start and display one or more movement and combat phases on just the umpire computer followed by the manual transmission of a situation update to all players.

Do Game Run Out

Causes the game to run without spotting or combat and without any stop for orders until the game length limit is reached. Useful for rapidly ending a solitaire game once you have recognized a hopeless situation. Selection of this menu item will cause its title to change to "**Stop Game Run Out**". This menu item is only available in solitaire games. Selecting

Stop Game Run Out

Restores normal game functioning during a game run out.

17.3 The Orders Menu

Do Blue (Through Yellow) Unit Orders

Specifies with a check mark which force is currently able to give orders to its units. The same applies for Red, Green, Gray, Ivory, Orange, Gold, and Yellow.

Artillery Support

Displays a window which controls off map artillery fire missions.

Air Support

Displays a window which controls air support missions.

Unload Unit

Unloads all infantry units carried by one or more selected vehicles. If a vehicle is not already selected (by a previous mouse click) when this menu item is chosen, a cross hair cursor will be shown and you can then select a vehicle to unload.

Load Unit

Places selected infantry units into a selected vehicle. If vehicle or infantry units are not already selected (by a previous mouse click) when this menu item is chosen, a cross hair cursor will be shown and you can then select the units.

Orders

Do Blue Unit Orders
Do Red Unit Orders
Do Green Unit Orders
Do Gray Unit Orders
Do Ivory Unit Orders
Do Orange Unit Orders
Do Gold Unit Orders
Do Yellow Unit Orders

Artillery Support...
Air Support...

Unload Unit...
Load Unit...
Split Unit...
Join Unit...
Duplicate Unit...

Copy Orders
Paste Orders
Copy SOP
Paste SOP

Set Engagement Range...
Find Unit...

Split Unit

Divides one or more unit markers into subunits. If a unit is not already selected (by a previous mouse click) when this menu item is chosen, a cross hair cursor will be shown and you can then select the unit to divide.

Join Unit

Groups or joins all selected units, of the same type, into one unit marker. If a unit is not already selected (by a previous mouse click) when this menu item is chosen, a cross hair cursor will be shown and you can then select units to group.
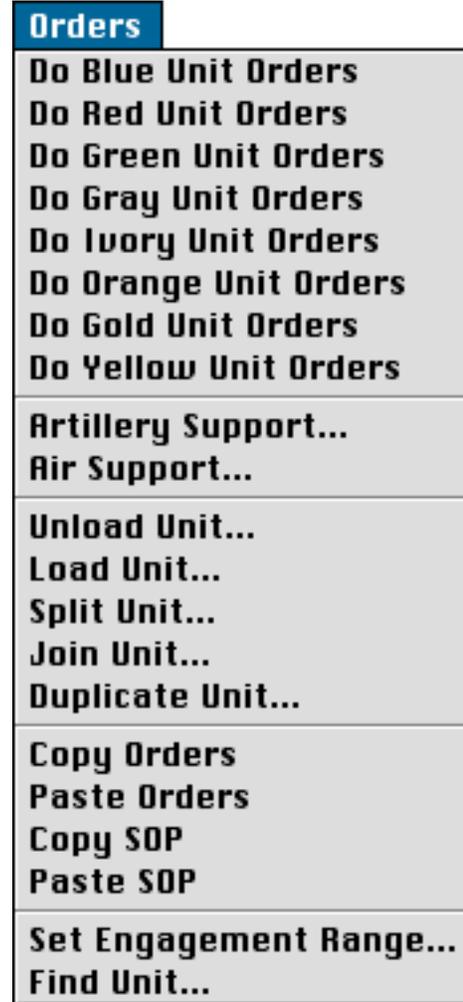
Duplicate Unit

Duplicates all selected units and places them into a setup window for map placement. This menu item is only available if the **Options/Enable Umpire Tools** menu item has been check marked.

Shortcut. The following items are very important shortcuts for speeding game setup and play. In general, while the **Unit Setup Window** is open or when a **Unit Orders Window** is open, if one or more units are already selected (by previous mouse clicks) either on the map or in a setup window, you can load units by touching the "L" key, you can unload units by touching the "U" key, you can split units by touching the "S" key, and you can join units by touching the "J" key. The usage of the L, U, S, and J hot keys does not always match user interface guidelines, in that they will often function without the customary modifier key. This inconsistency is outweighed by the great convenience and setup speed that these four hot keys provide the experienced user.

Copy Orders and Paste Orders

Copies the orders of one unit into one or more other units. To copy orders, first select a unit on the map either by opening its **Unit Orders Window** or by "shift clicking" on its marker or by dragging a selection rectangle around it. Once the unit is selected, copy its orders into memory by selecting the **Copy Orders** menu item or by pressing the customary [Windows] Control+C key or [Macintosh] Command + C key combination. The unit will blink as its orders are copied. Next select one or more units on the map to paste the orders into, by shift clicking on unit markers or by dragging a selection rectangle around them. Then paste the orders from memory into the selected units by selecting the **Paste Orders** menu item or by pressing the customary [Windows] Control + V or [Macintosh] Command + V" key combination. Each selected unit will blink as it receives the pasted orders. The pasted orders will completely replace any orders already held by the unit. You may also paste orders into a unit with an open **Unit Orders Window**. The keystroke sequence of [Windows] Control + Alt + V or [Macintosh] Command + Alt + V may be used to append orders in memory onto the end of a selected unit's existing list of orders without deleting any orders currently held by the unit. Both paste methods will also work for a unit whose orders window is open.

Shortcut. If you select the Copy Orders menu item without any unit selected on the map, you will be prompted to click on a unit to copy from.

Shortcut. If you select the Paste Orders menu item without any unit selected on the map, you will be prompted to click on a unit to paste orders into.

Copy SOP and Paste SOP

Allows you to copy the SOP settings of one unit into one or more other units. To copy SOP settings, first select a unit on the map either by opening its **Unit Orders Window** or by "shift clicking" on its marker or by dragging a selection rectangle around it. Once the unit is selected, you copy its SOP setting into memory by selecting the **Copy SOP** menu item. The unit will blink as its SOP settings are copied. Next select one or more units on the map to paste the SOP into, by shift clicking" on unit markers or by dragging a selection rectangle around them. You

can then paste the SOP settings from memory into the selected units by selecting the **Paste SOP** menu item. Each selected unit will blink as it receives the pasted SOP. You may also paste SOP settings into a unit with an open **Unit Orders Window.**

Shortcut. If you select the Copy SOP menu item without any unit selected on the map, you will be prompted to click on a unit to copy from.

Shortcut. If you select the Paste SOP menu item without any unit selected on the map, you will be prompted to click on a unit to paste the SOP into.

You can have both copied orders and copied SOP settings in memory at the same time.

Set Engagement Range

Sets the engagement range of a selected unit or group of units to either zero or maximum range. Select one or more units by shift clicking on unit markers or by dragging a selection rectangle around them. Then select the **Orders/Set Engagement Range** menu item. A dialog will appear. Click on the dialog button that sets all selected units to zero range or on the button that sets all selected units to maximum range.

Shortcut. If you select the **Orders/Set Engagement Range** menu item without any unit selected on the map, you will be prompted to click on a unit to set its engagement range.

Find Unit

Allows the player to find a unit marker by its unit ID and to open its **Unit Orders Window**. If necessary the screen will scroll to the unit to make sure it is visible. f the unit is on the map, its **Unit Orders Window** will be opened. If the unit is loaded aboard an APC or a tank, the carrying unit's **Unit Orders Window** will be opened.

17.4 The Map Menu

Selecting an item in the **Map Menu** will usually produce a cosmetic change in the games visual display. Game logic, the computer opponent, movement, and combat are not affected in any way by settings in this menu.

Change Unit Symbol Size

Changes the unit display symbols to small, medium, or large. Done repeatedly, will cycle through all three views. Symbol size does not effect game logic. **Shortcut**. Press the F2 key.

Change Unit Symbol Info

Changes the unit display symbols to unit type, unit disposition/facing, or unit orders view. Done repeatedly, will cycle through all three views. **Shortcut**. Press the F3 key.

Change Unit Symbol Style

Changes the unit display symbols to silhouette style or wire box style. **Shortcut**. Press the F4 key.

Frame Own Units

Frames a player's unit markers in green so that his units stand out from those of his teammates in a multiplayer teams game.

Hide Units of Teammates

Hides from view all friendly units that do not belong to the player in a multiplayer teams game.

Hide Units With Orders

Hides from view all friendly units with unexecuted orders. Useful as a memory aid and to reduce screen clutter during orders phase when dealing with many units.

Map
Change Unit Symbol Size
Change Unit Symbol Info
Change Unit Symbol Style
Frame Own Units
Hide Units of Teammates
Hide Units With Orders
Hide Units With Checks
Hide All Units
Redraw Map
View Terrain
Line of Sight Check
Thermal LOS Check
Show Scroll Bars
Show 1000m Grid
Show Grid Coordinates
Show Situation Map...
Plotting Options ▶
Plot Unit Names
Plot Fire Support
Plot Target Ref Points
Plot Mission Objectives
Plot Minefield Lanes
Plot All Above
Plot None Above
Plot Wrecks
Clear Wrecks
Map Legend
View Overlay
Change Overlay
View Place Names
Terrain Analysis

Hide Units With Checks

Hides from view all friendly units that have had their **Unit Orders Window** opened during the current orders phase. Reduces screen clutter. Useful as a memory aid and to reduce screen clutter during orders phase when dealing with many units. If the Alt key is held down when this menu item is selected, the internal "unit checked" flags will be cleared and reset for all units just as if a new orders phase had been started.

Hide All Units

Hides from view all friendly units. Reduces screen clutter.

Redraw Map

Instantly updates and redraws the map. Useful to correct the occasional map or screen oddity.

View Terrain

Temporarily removes all unit, smoke, and wreck symbols from the map so that you can clearly see the terrain underneath.

Line Of Sight Check

Examine the normal eyesight line-of-sight and the range in meters between two points and displays the terrain type and the UTM coordinates of the end point. When checking the line of sight of a unit, make your start point the approximate center of the unit symbol. The cross hair cursor will be clear if there is a clear line of sight between the from point and the current center of the cursor. If the cursor fills with black, then the line of sight is blocked. If the cursor turns gray then there is a clear line of sight but the range is greater than the maximum allowed visibility. The line of sight routine can also be pinned to a selected unit. To use, select a unit by shift selecting or dragging a selection rectangle around it, then select the **Line of Sight** menu item. Move the mouse to check line of sight but do not press the mouse button until ready to turn off the pinned line of sight check. If the selected unit has thermal sights the routine will automatically show the unit's thermal line of sight.

Thermal LOS Check

Examine the thermal imaging line-of-sight and the range between two points and displays the terrain type and the UTM coordinates of the end point. The cross hair cursor will be clear if there is a clear line of sight between the from point and the current center of the cursor. If the cursor fills with black, then the line of sight is blocked. If the cursor turns gray then there is a clear line of sight but the range is greater than the maximum allowed visibility.

Show Scroll bars

Maintains scroll bars on the screen if checked, and hides them if unchecked. When scroll bars are added or hidden, the map may automatically scroll to its upper left corner.

Show 1000m Grid

Draws a Universal Transverse Mercator (UTM) grid on the map with squares 1000 meters wide and 1000 meters tall.

Show Grid Coordinates

Draws a Universal Transverse Mercator (UTM) grid on the map with squares 1000 meters wide and 1000 meters tall and labels the boundaries of the squares with UTM style map coordinates. Unless specified otherwise in the scenario text, the UTM coordinates will not be real world coordinates. Map coordinates are read "right and up". See a later section for detailed instructions on how to read UTM coordinates.

Show Situation Map

Displays a miniaturized map showing the entire map and the location of all visible units. Some maps are too small to include a miniaturized view.

Plot Unit Names

Draws optional unit names (if any) alongside the unit markers on the map.

Shortcut. The Tab key turns this feature on/off.

Shortcut. Pressing the Tab key + Shift key will display the PIN numbers assigned to unit markers in a multiplayer teams game.

Plot Fire Support

Displays off map and on map ongoing artillery fire mission targets and ongoing air support mission targets. This item is only available during the orders phase and if on is automatically turned off at the start of a combat phase.

Plot Target Ref Points

Displays off map artillery target reference points. This item is only available during the orders phase and if on is automatically turned off at the start of a combat phase.

Plot Mission Objectives

Names and outlines map areas that are scenario mission objectives.

Plot Minefield Lanes

Highlights any lanes that have been cleared in mine fields by the passage of friendly units.   This item is only available during the orders phase.

Plot Wrecks

Controls whether existing wrecks are drawn on the map. If unchecked, wreck markers are temporarily not plotted. There is a limit to the number of wrecks that can be displayed. If this limit is met the game will either begin deleting and replacing the oldest wreck markers or it will stop displaying new wrecks altogether.

Clear Wrecks

Permanently deletes all existing wreck markers.

Map Legend

Displays optional text information for and about some maps.

View Overlay

Loads a map overlay file which was saved in bmp format. This feature is intended to allow an expert user to create and then display optional military operational control graphics on a TacOps map. The first time that this menu item is selected, the user will be asked to select a bmp file. The selected bmp file will then be loaded and blended into the current TacOps battle map display. Any part of the bmp file that is not "perfect" white, will be added to the TacOps battle map. Any part of the bmp file that is perfectly white will be ignored. Subsequent selection of the "Map/Menu Overlay View" menu item will toggle the map overly display off and on.

Shortcut. Press the F5 key.

The best way to create a map overlay is to use a paint program that is sophisticated enough to allow editing in layers. With such a program the user can place a bmp file for a TacOps map into a background layer and then use one or more layers above the background for the placement of the operational control graphics. Once the overlay is finished, the user can temporarily hide the background layer and then save or export only the layer or layers with the operational control graphics to a bmp format file for subsequent use as a TacOps map overlay.

A less efficient way to create a map overlay would be to use a simpler, program without layers such as Microsoft Paint to open a copy of a TacOps map file in bmp format and then add the operational control graphics directly to the map surface. The drawbacks to this approach are mainly that drawing errors in the overlay are difficult to correct and the overlay is not easily changed after completion.

Change Overlay

Allows the user to load a different overlay without having to restart TacOps.

Shortcut. Press the Shift + F5 keys.

View Place Names

Loads a specially formatted text file containing place names or other text information to be displayed on a map. This feature is intended to allow an expert user to create and display optional text information on a TacOps map. Selection of this menu item will cause the information in this file (if the file is present) to be embedded into the battle map inside yellow rectangles. A second selection of this menu item will remove the place names from the map display.

The file name of a place names file must use the following convention: "MapXXXc.names" where "XXX" represents the three digit number of the companion map. For example a place names file for "Map001c.map" would be titled "Map001c.names".

The text contents of the place name file must be saved as plain text and must follow the following convention exactly for each line of text: six digit UTM coordinate (using only number characters), one tab character, text to be displayed, carriage return. The UTM coordinate is not displayed – it is only used by the program to determine where to place the lower left corner of the yellow rectangle that will contain the rest of the line of text. The tab character is not displayed.

Shortcut. Press the F6 key.

Terrain Analysis.

Temporarily replaces the normal map view with a terrain analysis and trafficability overlay. Roads are painted white. Clear terrain and Rough1 through Rough4 terrain are painted with proportional shades from light gray to dark gray. Water is blue. High ground is framed in brown. Urban terrain cells are marked with a dark red center dot.   Impassable terrain is marked with a black square containing a white number from 1 to 3, with 1 representing no go terrain for wheeled vehicles, 2 is no go for wheeled and tracked vehicles, and 3 is no go for wheeled and tracked vehicles and dismounted infantry.

Shortcut. Press the F8 key.

17.5 The Reports Menu

Game Status

Provides information on the current strength and cumulative losses of each force plus the amount of damage done by each force expressed as attrition points. If the "No Enemy OOB Reports" preferences item has been marked, enemy numbers will not be shown in this report until the end of the game. At the end of the game this report will also state which force has succeeded or failed in its mission.

Order of Battle

Displays the current strength of each force in a graphic format. If the "No Enemy OOB Reports" preferences item has been marked, enemy units will not be shown in this report.

Unit Data Base

Displays detailed information on all units in the TacOps data base.

Weapon Data Base

Displays detailed information on most weapons in the TacOps data base.

Photo Data Base

Displays photographs of many units and weapons in the TacOps data base.

Situation Report

Reports the name, type, size, direction of movement if moving, damage, and map coordinate location for all friendly units. Double clicking on any line that contains the characters "ID:" will open the **Unit Orders Window** for that unit. If the unit is loaded aboard an APC or a tank, the carrying unit's **Unit Orders Window** will be opened. Right clicking on an item line will produce a popup menu with additional options including **Open Unit Orders Window** and **Find Unit Marker**.
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Spot Report

Reports the type, size, direction of movement if moving, and map coordinate location for any enemy unit that was spotted at any time during the previous combat phase. The location reported is the position of the unit when it was last spotted. The unit may or may not still be at that

location. Right clicking on an item line will produce a popup menu with additional options including **Find UTM Grid Coordinates**

Support Report

Reports the status of available artillery and air support. The following information is provided for off-map and on-map artillery and mortar units: ammunition on hand, current firing status, map coordinates of current target, ammunition being fired at current target, accuracy of current firing, and the next time on target for current firing. The following information is provided for air support: current sortie availability, current mission status, minutes to current target, and the map coordinates of the current target. Double clicking on any line in the report will open the **Artillery Support Window**, or the **Air Support Window**, or the **Unit Orders Window** for the selected item. Right clicking on an item line will produce a popup menu with additional options, including **Open Unit Orders Window**.

TRP Report

Reports all friendly artillery and mortar Target Reference Points. The following information is provided for each TRP: TRP map coordinates and TRP accuracy. Right clicking on an item line will produce a popup menu with additional options **Find UTM Grid Coordinates**

Logistics Report

Reports the current ammunition supply for all friendly units. Units having 50 or less percent of their basic load for any weapon will be highlighted with a special character. Double clicking on any line that contains the characters "ID:" will open the **Unit Orders Window** for that unit. If the unit is loaded aboard an APC or a tank, the carrying unit's **Unit Orders Window** will be opened. Right clicking on an item line will produce a popup menu with additional options, including **Open Unit Orders Window**, **Resupply**, and **Find Unit Marker**.

17.6 The Network Menu

The **Network Menu** is only available during
network game sessions**.**

Log Onto Network

When selected by the host, creates a TacOps
game network. When selected by a joiner, looks
for a TacOps game network and joins it.

Send Situation Update To All

Transmits a situation update to all players. The
progress of the situation update will be displayed
in the information line at the bottom of the map
window. Any errors in the transmission will be
reported with an error sound and either an alert
window or a message in the information line. If
the situation update is successful, the players can proceed to giving orders to their units. If the
situation update fails, the umpire should take appropriate steps to correct the network problem.

Send A Message

Displays a window that can be used to send simple text messages to other players. This feature
can conflict with the data flows of the orders exchange process and the situation update. It
should not be used frequently. If players expect a heavy chat load during a network game then
they should handle that requirement by running a popular IRC client (such as MIRC) as a
background application. **Shortcut** press the F12 key.

Network Status

Displays a window listing the players who are currently logged onto the game network. The
window also allows the host to do the following tasks: disconnect an individual player, send a
situation update to just one player, and to get orders from just one player. Only available to the
host in a multiplayer teams game.

Pause Game

Temporarily disables the TacOps user interface on all remote computers in a multiplayer
network game. Remote players will not be able to give unit orders, will not be able to access any
menu item, and will see only a large red circle with bar on a black background. Only available
to the host in a multiplayer teams game. Selecting this menu item a second time will enable the
user interface on all remote computers. **Shortcut** press the Ctrl + P key [Macintosh Cmd + P].

Umpire Controls Turns

If this item is check marked, the umpire must select the "Begin Combat" menu item on the umpire computer before each movement and combat phase can take place. If this item is not check marked then each movement and combat phase will be started automatically as soon as every remote player has selected the "Begin Combat" menu item on their computers. Only available to the host in a multiplayer teams game.

Change PIN Listed Units

Produces a listing of all unit markers of a given color - for example all Blue markers. The listing shows the current PIN of each listed marker. To change the PIN for any listed item, double click on that item in the list. A small window will then appear into which can be typed a new PIN for that unit. The umpire may also use this window to assign a text name to that unit. **Shortcut**. If the "**C**" key is touched while an item in the list is selected, the PIN for that item will be copied to memory. If the "**V**" key is touched while an item in the list is selected, the last PIN to be copied into memory will be pasted into that item. Only available to the host in a multiplayer teams game.

Change PIN Selected Units

Displays a window for assigning a PIN to a group of selected unit markers. The group of markers can have been drag selected prior to the opening of this window or the group can be selected after the window is opened by clicking on one of the buttons in the window such as "Select all Blue". The first selection method should be used to change only some markers of a given color. The second method should be used when all markers of a given color need to be changed. Only available to the host in a multiplayer teams game.

Change PIN Off Map Artillery

Displays a listing of all off map artillery of a given color - for example all Blue off map artillery. The listing shows the current PIN of each listed item. To change the PIN for any listed item, double click on that item in the list. A small window will then appear into which can be typed a new PIN for that item. The umpire may also use a button in this window to set the PIN of all off map artillery of a given color. **Shortcut**. If the "**C**" key is touched while an item in the list is selected, the PIN for that item will be copied to memory. If the "**V**" key is touched while an item in the list is selected, the last PIN to be copied into memory will be pasted into that item. Only available to the host in a multiplayer teams game.

Change PIN Air Support.

Displays a listing of all pending air sorties of a given color - for example all Blue sorties. The listing shows the current PIN of each listed item. To change the PIN for any listed item, double click on that item in the list. A small window will then appear into which can be typed a new PIN for that item. **Shortcut**. If the "**C**" key is touched while an item in the list is selected, the PIN for that item will be copied to memory. If the "**V**" key is touched while an item in the list is

selected, the last PIN to be copied into memory will be pasted into that item. Only available to the host in a multiplayer teams game.

Change PIN All

Displays a window which provides a "one click" method to instantly transfer all game items with a given PIN from one player to another. Only available to the host in a multiplayer teams game.

More Network Tools

Displays a window containing additional network game tools and controls. Currently this window is a "catch all" for seldom used and or experimental network game features.

Host/umpire version.

Allow players to instantly reposition their unit markers.   Temporarily enables all remote players to reposition (magic move) unit markers by using the Shift + Click procedure which is normally only available during the setup phase. Selecting this item a second time turns off the feature.

Allow players to send orders manually to umpire. Sends a signal to all player computers enabling them to choose to manually and individually send orders data to the host/umpire computer. This feature could be useful in a game setup situation where the umpire is allowing the players an extended period of time to reposition their units and to give orders to their units prior to running the first combat phase.   In this situation, manually obtaining orders data incrementally from the players as they finish their orders would reduce the risk that a user error, a power failure, a network failure, or a program failure prior to the first combat phase might wipe out hours of player preparation. Selecting this item a second time turns off the feature.

Send "combat done" signal to all. Sends a signal to all player computers indicating that the combat phase has finished and authorizes all player computers to begin a new orders phase. Normally this signal is sent automatically by the host/umpire computer after it senses that the combat phase has finished on all computers, however occasionally during Internet play the automatic signal or a cueing signal that it depends on will be lost or missed. The result of the lost signal is that the players will have a grayed, disabled menu bar and will not be able to give

new orders to their units. The host/umpire can use this menu item to instantly correct this situation for all remote players.

Send a sound. Sends a signal to all player computers to play an alert sound. It is left to the umpire to define the game significance of this alert sound.

Get orders from all players. Allows the host/umpire to manually obtain orders data from all players without executing a combat phase. This can be useful in the setup portion of a game session.

Joiner version.

Send orders to umpire. Allows a remote player to manually send his orders data to the host/umpire without triggering a combat phase. This can be useful in the setup portion of a game session.

17.7 The Options Menu

The **Options Menu** allows you to modify certain game, scenario, weapon, and unit characteristics. Most of the items in the **Options** menu are only available during the first orders turn or the setup phase of a new game unless the **Options/Enable Umpire Tools** menu item is check marked.

Note: In two player and multiplayer games the **Add One Unit** menu item along with most other scenario editing menu items will be grayed out (disabled) unless the player has first selected and check marked the appropriate **Orders/Do Unit Orders** menu item for his color.

Enable Umpire Tools

Activates game features that facilitate the conduct of umpired games and allows unlimited use of scenario editing menu items that are normally disabled after the setup turn. See the **Scenario Editing and Umpire Tools** section for more information.

Use Click Sound

Substitutes a quiet click for many sound effects. This change will be remembered from game to game, even after cold restarts.

Preferences

Presents a window which will alter certain game, unit, and weapons characteristics. Preferences includes game option settings that are controversial. See the section titled **Game Options and Preferences** section for more information.

Change Combat Speed

Alters the speed with which messages are displayed in the information window during the combat phase. See the section titled **Game Options and Preferences** section for more information.
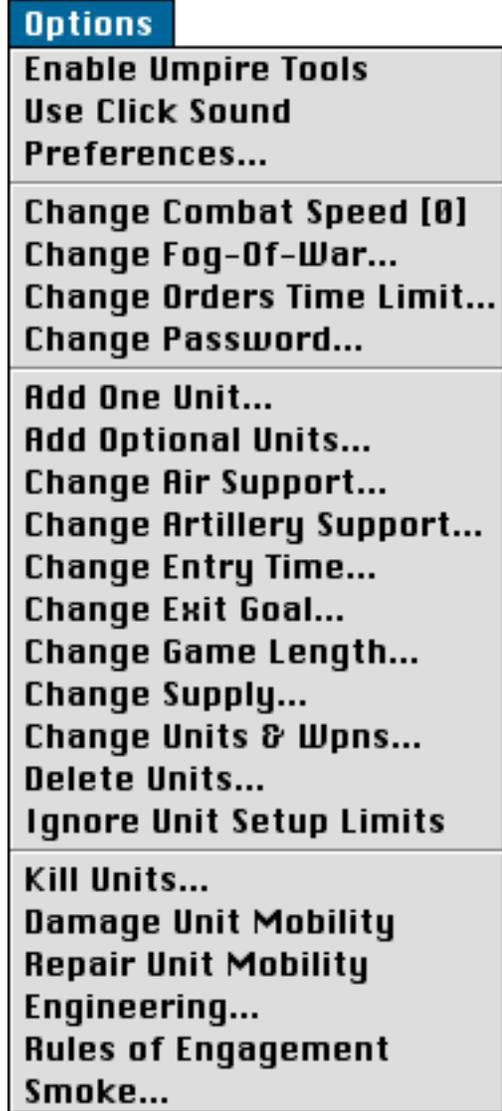
Change Fog-Of-War

Chooses between realistically limiting screen display only to legally spotted units or to unrealistically display one side's forces to the other at all times. See the section titled **Game Options and Preferences** section for more information.

Change Orders Time Limit

Specifies a time limit for giving orders to units during each orders phase. When the timer expires the next combat phase starts automatically. Makes for a very stressful and realistic game when set at a very low value.

Change Password

Change or adds anti-snooping password protection in multiplayer games. See the section titled **Game Options and Preferences** section for more information.

Add One Unit

Adds one unit marker at a time to either side's order of battle. See the **Scenario Editing and Umpire Tools** section for more information.

Add Optional Units

Adds a group of unit markers to one or both side's order of battle. Some scenarios do not include optional unit groups. See the **Scenario Editing and Umpire Tools** section for more information.

Change Air Support

Alters the air support available in a scenario. See the **Scenario Editing and Umpire Tools** section for more information.

Change Artillery Support

Alters the off map artillery support available in a scenario. See the **Scenario Editing and Umpire Tools** section for more information.

Change Entry Time

Changes the map entry times of units that begin a game off map. See the **Scenario Editing and Umpire Tools** section for more information.

Change Exit Goal

Resets the official exit percentage required of a force for mission accomplishment or game victory. See the **Scenario Editing and Umpire Tools** section for more information.

Change Game Length

Resets the official end of game time. See the **Scenario Editing and Umpire Tools** section for more information.

Change Supply

Increase or decrease the resupply points available during a scenario to a given force. See the **Scenario Editing and Umpire Tools** section for more information.

Change Units & Weapons

Presents a window box of weapons modifications such as changing all T80 tanks to the older T72, or changing all M1 tanks to M60s, or exchanging Canadian equipment for US. See the **Scenario Editing and Umpire Tools** section for more information.

Delete Units

Removes user selected units from the Blue and Red order of battle without penalty. See the **Scenario Editing and Umpire Tools** section for more information.

Ignore Unit Setup Limits

Allows unit markers to be put on the map without regard to any normal scenario unit placement restrictions. See the **Scenario Editing and Umpire Tools** section for more information.

Kill Units

Removes selected units from play as if they had been eliminated through combat action. See the **Scenario Editing and Umpire Tools** section for more information.

Damage Unit Mobility

Damages the mobility of user selected units. See the **Scenario Editing and Umpire Tools** section for more information.

Repair Unit Mobility

Repairs the mobility of user selected units. See the **Scenario Editing and Umpire Tools** section for more information.

Engineering

Instant placement or removal of minefields, obstacles, bridges, landing zones, and entrenchments. See the **Scenario Editing and Umpire Tools** section for more information.

Rules of Engagement

Allows an umpire to specify the level of hostility between any combination of eight marker colors.

Smoke

Allows an umpire to instantly place and remove smoke or a line of smoke. See the **Scenario Editing and Umpire Tools** section for more information.

17.8 The Help Menu

Guide - User

Summons an online help file.

Guide – Scenarios

Summons an online help file containing a text description of the situation, the order of battle, and the victory objectives for most TacOps scenarios.

[Windows] **About TacOps** displays copyright, license, and author information.

[Macintosh] The **About TacOps** menu item is in the **Apple** Menu list.
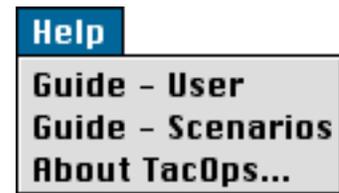
18. Scenario Editing And Umpire Tools

Most of these features are accessed via the **Options Menu**. These features allow you to modify certain game, scenario, weapon, and unit characteristics. Most of these items are only available during the setup phase of a new game unless the **Options/Enable Umpire Tools** menu item is check marked. Some of the items are intended primarily for umpired games and for experimental use by very experienced players and do not provide an Undo feature. Save often when using items that make drastic game changes such as **Change Entry Times** and **Change Units & Weapons**.

18.1 Enable Umpire Tools

This menu item is at the top of the **Options menu**. Check marking this menu item activates game features that facilitate the conduct of umpired games and allows unlimited use of scenario editing menu items that are normally disabled after the setup turn.

18.2 Add One Unit
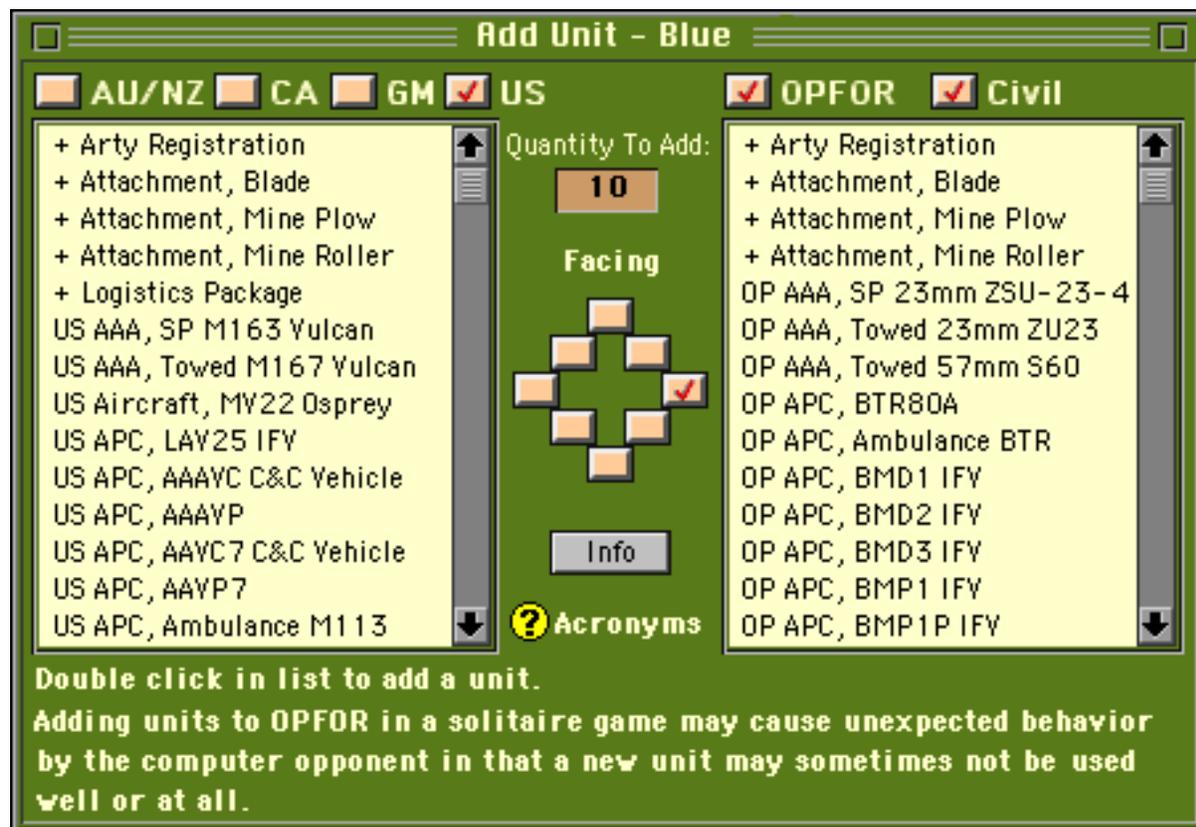
The **Options/Add One Unit** menu item displays a window that can add one unit marker at a time. Set the number of elements that you want to be in the marker by filling in the box labeled "Quantity to Add:". Next, check mark one of the **Facing** boxes to specify the initial facing of the new unit and then double click on the desired unit in either the Allied list or in the OPFOR list. The **Add Unit Window** will disappear and a cross hair cursor will appear. Click the cursor on

the map where you want the unit to be placed. The appropriate unit marker will then appear on the map and the **Add Unit Window** will reappear. This option is only available during the first orders phase unless umpire mode has been engaged.

Use the check boxes labeled AU/NZ (Australia and New Zealand), CA (Canada), GM (Germany), US (United States), OPFOR, and Civil (civilian and paramilitary) to decrease or increase the number of units included in the scrolling list boxes.

The **Info** button will display a **Unit Information Window** for a selected line item.

In two player and multiplayer games the **Add One Unit** menu item along with most other scenario editing menu items will be grayed out (disabled) unless the player has selected and check marked the **Orders/Do Unit Orders** menu item for his color.

Caution: This feature is provided mainly to allow additional force tailoring for two player games. OPFOR units added to solitaire games through this feature will often not be properly controlled by the computer opponent.

18.3 Add Optional Units

Some scenarios allow you to increase the size of friendly and or enemy forces through the addition of optional units. Often such optional units will consist of multiple markers - platoon through regiment. Most optional units are merely reinforcements. Others are armed with near-future weapon systems such as the USMC LAV assault gun and LAV air defense variants. Minefields and entrenchments may also be available as optional units. Select the **Options/Add Optional Units** menu item and then select the specific unit or units to be added from the list of available forces. Selected optional units may appear instantly or they may not appear until later in the game. If needed, the computer will provide instructions on how to select a setup or entry point on the map for the optional forces. This option is only available during the first orders phase unless umpire mode has been engaged. OPFOR units added to solitaire games through this feature will be properly controlled by the computer opponent.

18.4 Change Air Support

The **Options/Change Air Support** menu item alters the air support available in the scenario.

The number, type, and nature of air support sorties available to each force can be changed as can the percentage chance of a force receiving additional air missions during a game. This option is only available during the first orders phase unless umpire mode has been engaged.

18.5 Change Artillery Support

the **Options/Change Artillery Support** menu item alters the off map artillery support available in the scenario. The user can set the type of artillery support available in a scenario, change the number of available artillery fire missions, change artillery mission ammunition available for those missions, and change the percentage chance of a force receiving additional artillery ammunition during a game. This option is only available during the first orders phase unless umpire mode has been engaged.

```
┌─────────────────────────────────────────────────────────┐
│ □≡══════ Off Map Artillery Support - Blue ═══════□        │
│  ┌─────────────────────────────────────────────────┐ ▲   │
│  │ 01. 155mm Howitzer, Busy. Ammo: ICM x 2, HE x 10, Smoke x 3 │ ▣ │
│  │ 02. 155mm Howitzer, Idle. Ammo: ICM x 2, HE x 10, Smoke x 3 │   │
│  │                                                 │ ▼   │
│  └─────────────────────────────────────────────────┘     │
│                                                           │
│   ┌──────┐  [0..25] Chance of New Ammo.                   │
│   │  0   │                                                │
│   └──────┘                                                │
│  Ammunition:                                              │
│   ┌──────┐           ┌──────────┐  ┌────────────┐         │
│   │  2   │  ICM      │ Add Unit │  │ Delete Unit│         │
│   └──────┘           └──────────┘  └────────────┘         │
│   ┌──────┐                                                │
│   │ 10   │  HE                                            │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │  3   │  Smoke                                         │
│   └──────┘                                                │
│  Details:                                                 │
│   ┌──────┐                                                │
│   │ 60   │  Minimum seconds until first impact            │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │ 120  │  Maximum seconds until first impact            │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │ 30   │  Minimum seconds between adjustment rounds      │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │ 60   │  Maximum seconds between adjustment rounds      │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │ 30   │  Minimum seconds between salvos                 │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │ 60   │  Maximum seconds between salvos                 │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │ 60   │  Minimum seconds to shift fire to TRP           │
│   └──────┘                                                │
│   ┌──────┐                                                │
│   │ 90   │  Maximum seconds to shift fire to TRP           │
│   └──────┘                                                │
└─────────────────────────────────────────────────────────┘
```

18.6 Change Entry Time

The **Options/Change Entry Time** menu item changes the map entry times of units that begin a game off map.

```
┌─────────────────────────────────────────────────────────┐
│ Armored Cavalry Troop                      ┌──────────┐   │
│                                            │  Cancel  │   │
│                                            └──────────┘   │
│ Entry time for leading unit:  ┌────────┐  ┌──────────┐ ┌──────┐ │
│                               │  0720  │  │ << Set It│ │ Next │ │
│                               └────────┘  └──────────┘ └──────┘ │
│                                                           │
│  [▥] [▥] [▥] [⚘] [▥] [⚘] [▥] [⚘] [▥] [⚘] [▥] [▥]        │
│  0720 0720 0720   0720   0720   0720   0720 0720         │
│                                                           │
│  [⚘] [▥] [⚘]                                             │
│  0720                                                     │
└─────────────────────────────────────────────────────────┘
```

This menu item displays a window that can alter the arrival times of units that start a scenario from off map positions. Once the window appears, enter the new time that you wish the leading unit marker in a given group to appear on the map and click on the **Set It** button. The impact, if any, of that change on other markers in the unit will be instantly shown underneath each marker.

If you don't wish to change a particular group, click on the **Next** button. This option is only available during the first orders phase unless umpire mode has been engaged.

18.7 Change Exit Goal

The **Options/Change Exit Goal** menu item resets the official exit percentage required of a force for mission accomplishment or game victory. This item is only applicable to those scenarios that include an exit percentage as a mission condition. The user can increase or decrease the percentage of units that must be exited off the map for victory. This option is only available in scenarios that feature exiting as a victory condition and then only during the first orders phase unless umpire mode has been engaged.

18.8 Change Game Length

The **Options/Change Game Length** menu item resets the official end of game time. The user can increase or decrease the number of minutes before the game ends. This option is only available during the first orders phase. If this option is used in a play by mail game or in a network game and the program discovers during an orders exchange that the player's have different time limit settings, the computer will automatically change the Red setting to match that used by the Blue player.

18.9 Change Supply

The **Options/Change Supply** menu item allows the user to increase or decrease the resupply points available during a scenario to a given force. This option is only available during the first orders phase unless umpire mode has been engaged.

18.10 Change Units & Weapons

The **Options/Change Units & Weapons** menu item presents a window box of possible unit and weapons modifications and exchanges such as changing all T80 tanks to the older T72, or changing all M1 tanks to M60s, or exchanging Canadian equipment for US. By using this window you can change some weapons into older versions. For example, changing the future Javelin ATGM into the current Dragon ATGM, or change older versions into new. You can also exchange certain units or vehicles for other units of a similar type. For example, exchanging US M2 Bradley APCs for the M113 APCs more appropriate to Canadian forces.

Caution: You should save frequently when using this feature as there is no "undo" command. To change just one unit that is located on the map, shift select or drag select the desired unit before selecting this menu item. To change just a few units of a like kind that are located on the map, shift select or drag select the desired units before selecting this menu item. To change all units of a like kind, on or off the map, just select the menu item - don't shift or drag select any units on the map beforehand. This option is only available during the first orders phase unless umpire mode has been engaged.

Note to non-US users. This menu item is the primary gateway to converting US oriented scenarios to the units and equipment of other nationalities. The exchange process will not automatically produce perfect representations of non-US organization. The weapons and equipment characteristics will be correct, but the quantities of a given weapon system or a given vehicle in a platoon or company marker will be those of the original US organization.

18.11 Delete Units

The **Options/Delete Units** menu item removes user selected units from the Blue and Red order of battle without penalty. When a unit is 'deleted' it is removed from game play as if it had never existed. A 'deleted' unit will not produce attrition points nor will it show up in reports as an eliminated unit. Selecting this menu item produces a cross hair cursor. Click the cross hair on the unit in the setup window or on the map that you wish to delete. This option is only available during the first orders phase unless umpire mode has been engaged. Useful when only a part of startup or optional units is wanted or for recovering from mistakes such as adding the wrong optional units.

18.12 Ignore Unit Setup Limits

The **Options/Ignore Unit Setup Limits** menu item allows unit markers to be placed on the map without regard to any normal scenario unit placement restrictions. Once this menu item is selected, a check mark will appear beside it. In two player games, a note will be automatically sent to your opponent indicating that you have used this feature. This option is only available during the first orders phase unless umpire mode has been engaged.

The next four items are intended mainly for use during umpired games.

18.13 Kill Units

The **Options/** Kill Units menu item removes selected units from play as if they had been eliminated by enemy fire. A 'killed' unit produces attrition points, it will show up in reports as an eliminated unit and a wreck marker may be plotted on the map. Selecting this menu item produces a cross hair cursor. Click the cross hair on the unit in the setup window or on the map that you wish to delete. This option is only available after the **Options/Enable Umpire Tools** menu item has been selected and check marked.

18.14 Damage Unit Mobility

The **Options/Damage Unit Mobility** menu item damages the mobility of selected units. This menu item is only available if **Options/Enable Umpire Tools** has been activated.

18.15 Repair Unit Mobility

The **Options/** menu item repairs the mobility of selected units. This menu item is only available if **Options/Enable Umpire Tools** has been activated.

18.16 Engineering Tools

The **Options/Engineering** menu item allows an umpire to instantly place or remove minefields, obstacles, bridges, landing zones, and entrenchments. This menu item is only available if **Options/ Enable Umpire Tools** has been activated.

18.17 Build/Remove Minefields

Select the **Build Minefield** button in the **Engineering Window**, complete the window items describing the minefield, and then click on the map where the minefield is to be placed. A minefield marker defines an area measuring 110 x 110 meters.
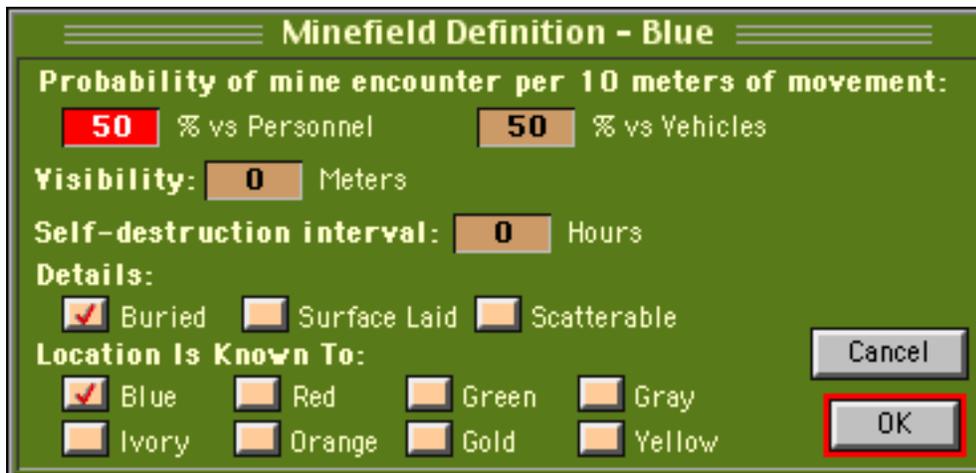
18.18 Build/Remove Entrenchments

Select the **Build Entrenchment** button in the **Engineering Window** then click on the map where an entrenchment is to be placed. An entrenchment marker represents a complex of moderately fortified fighting positions covering an area of 110 x 110 meters.

18.19 Build/Remove Obstacles

Select the **Build Obstacle** button in the **Engineering Window**, complete the window items describing the obstacle, and then click on the map where the obstacle is to be placed.

An obstacle marker defines an area measuring 110 x 110 meters. In TacOps there are five types of obstacles: ditch, ditch + wire, barricade, barricade + wire, or wire only. At the time of creation the umpire defines the counter mobility effect or crossing speed limitation that the obstacle will have on three classes of units: tracked vehicles, wheeled vehicles, and dismounted infantry. The umpire will enter a value from 0 to 100 for each class of unit. These values represent the maximum crossing speed of each class of unit - stated as a percentage of a unit's normal speed for the terrain in which the obstacle is located. If 100%, then the specified type of unit is not affected by the obstacle and can cross the obstacle at normal speed for the terrain that the obstacle is in. If 1% through 99%, then the specified type of unit can cross the obstacle at that percentage of its normal speed for the terrain that the obstacle is in. Example 10%: a unit of the specified type will move across the obstacle at 10% of its normal speed. The location of an

obstacle is not revealed to player colors different from its builder/owner until an opposing color marker moves into clear line of sight of the obstacle.

The umpire also specifies the breaching methods that are effective against the obstacle and how long breaching will take. A squad-hour equals ten man-hours. Non-engineer personnel produce one man-hour of obstacle breaching labor per man per game hour. Engineer personnel produce two man-hours of breaching labor per man per game hour. Only vehicles equipped with a blade, plow, or articulated arm can produce mechanical obstacle breaching labor. Most blade equipped vehicles produce one vehicle-hour of mechanical labor per vehicle per game hour. Some specialized vehicles produce 2 hours of mechanical labor per vehicle per game hour. The number of men and or vehicles that can efficiently work simultaneously on breaching an obstacle is limited by the settings in the "Manpower Limit" item and the "Vehicle Limit" item.

An explosive line charge will always have some breaching effect on an obstacle that includes wire, whether the explosive line charge button is check marked or not. However, an explosive line charge will not breach a ditch or barricade obstacle nor the ditch or barricade part of a combination obstacle unless the explosive line charge button is check marked.

18.20 Build/Remove Bridges

Select the **Build Bridge** button in the **Engineering Window**, complete the window items describing the bridge, and then click on the map where the bridge is to be placed.

When a bridge is created it is assigned one of the following Military Load Classifications (MLC): 10, 20, 30, 40, 50, 60, 70, 80, 90, or 100+. Bridges with a MLC of 100+ can support any weight. Bridges of MLC 10 through 90 are represented with a round yellow marker containing the MLC number in black. Bridges with a MLC of 100+ are represented with a round yellow marker containing an "infinity" symbol. A vehicle unit marker can not cross a bridge if the bridge's MLC is less than the weight in metric tons of one vehicle from the marker. The speed with which a unit marker can cross a bridge is adjusted according to the number of vehicles in the marker. The more vehicles in the marker, the longer it will take for the marker to cross the bridge. This abstraction represents the general need for military vehicles to cross a bridge in single file and at intervals so as to not exceed the weight capacity of the bridge. Placement of a bridge marker converts an area measuring 150x150 meters into bridge terrain. This technically

unrealistic size is a necessary abstraction to enable the player to (a) easily visually locate bridges on the map and (b) easily and quickly mark a movement path across a bridge. If bridges were portrayed accurately they would only measure one or two pixels in width and would be very difficult to find and work with during game play.

18.21 Build/Remove Helicopter Landing Zones

Select the **Build LZ** button in the **Engineering Window** then click on the map where an LZ is to be placed.

An LZ marker enables a helicopter to land, load, and unload in normally prohibitive woods and town terrain. An LZ marker provides no additional advantage in terrain that is not woods or town. LZs are represented with a round brown marker containing the characters "LZ" in black. Placement of an LZ icon marks an area measuring 150x150 meters as an LZ but does not otherwise change the nature of the terrain for ground movement, spotting, or combat. The location of a helicopter landing zone (LZ) marker is not revealed to player colors different from its builder/owner until an opposing color marker moves into clear line of sight of the LZ.

18.22 Rules of Engagement

The **Options/Rules of Engagement** menu item allows an umpire to specify or change the level of hostility between any combination of eight possible marker colors. This menu item is only available if **Options/Enable Umpire Tools** has been activated.

18.23 Add/Delete Smoke or Line Of Smoke

The **Options/Smoke** menu item allows an umpire to instantly place or remove a single smoke cloud or a line of smoke. A line of smoke can be any length and lie on any angle. Smoke produced with this menu item smoke will last for seven to eight minutes. This menu item is only available if **Options/Enable Umpire Tools** has been activated.

19. Custom Scenarios

Custom scenarios can be produced in two ways - by creating (saving) a game in progress file based on a standard scenario, and by creating (saving) a game in progress file based on a custom scenario template.

You create a custom scenario from a standard scenario by simply adding optional units and or by deleting startup units and saving the result as a saved game. This type of custom scenario can be played against the computer opponent.

You create a custom scenario from a custom scenario template as follows.

TacOps provides several scenario templates that can be used to create custom scenarios for two player games. Custom scenario templates load and function much the same as normal scenarios. The primary difference is that play against a computer opponent is not possible. A custom scenario is created by loading a custom scenario template, choosing a terrain map, adding friendly and enemy units from an expansive list of optional units, setting game options and preferences as desired, and then saving the game prior to starting the first combat phase. Few changes can be made once the first combat phase is started.

In a custom scenario, optional forces are not used up as happens in a normal scenario. You can repeatedly add any unit from the optional unit list. In theory, you can build as large a force as your computer has memory to manage. In practice, there are program variables that will yield undefined results (explode?) if overly exercised by adventurous owners of big systems. The program can be depended on to support several hundred units on each side given enough memory. If you go much beyond that you are exceeding the design goals of the program - accordingly, please do not get unduly exercised if your experiment yields unsatisfactory results. If you are going to attempt to build a monster game, save frequently during the design process. Realize also that the more units in play, the slower the game is going to function.

In a custom scenario the program will monitor and report the usual items in the game status report but it does not assess victory. Specifying missions, setting victory conditions, and determining victory are left to the players' judgment.

20. General Notes

20.1 Logistics

TacOps is a game of engagements lasting only a few hours so food, water, gas and other longer term essentials are not simulated. However, ammunition is tracked closely. Each unit starts with a set amount of ammunition. Firing reduces the unit's ammunition. When all the ammunition for a particular weapon is gone, that weapon will no longer fire. Your units will seldom run out of small arms ammunition but, armored vehicles will occasionally run out of main gun rounds, and anti armor units will frequently exhaust all their rockets or missiles. You can check a specific unit's ammunition status with the **Unit Info** button in the **Unit Orders Window**. You can check the ammunition status of all your units by using the **Reports/Logistics** menu items.

The **Logistics Report** displays the current ammunition supply for all friendly units. Units having ten or less percent of their basic load for any weapon will be highlighted with a special character. Double clicking on any line that contains the characters "ID:" will open the **Unit Orders Window** for that unit. If the unit is loaded aboard an APC or a tank, the carrying unit's **Unit Orders Window** will be opened.

Most scenarios allow limited, ammunition replenishment through the use of the **Supply Window**. Use the **Supply** button in the **Unit Orders Window** to summon the **Supply Window**. The **Supply Window** is a simplified, nonspecific representation of the many ways that additional ammunition can be in or get to a unit - by delivery, prestaging, carrying extra, scrounging, etc. Use of the resupply capability can often be very unrealistic. Its use should be governed by mutual agreement in two player games.

Adding ammunition costs supply points. The **Supply Window** shows how many supply points are available and how many are needed to add the desired amount of ammunition. Once all your supply points are gone, you can no longer resupply. The starting level of supply points varies with each scenario.

A transportable, user defined, Logistics Package marker can also be added to a scenario by using the **Options/Add One** Unit menu item. The Logistics Package marker can be used to resupply any unit that is located within 200 meters. The **Supply Window** is also used to access the supply points that are in a Logistics Package.

20.2 Hit and Damage Assessment

For direct fire weapons, the following guidelines are usually used by the computer to assess hits and damage.

A basic to-hit probability is calculated based on range to target. The to-hit probability is usually increased if the firer has previously shot at the same target. The to-hit probability is usually decreased if the target is in defilade or entrenched mode, is in smoke, rough, woods, or town terrain, or is moving. The to-hit probability is usually decreased if the firer is moving, suppressed or if the firing weapon is an anti-armor weapon and the target is infantry. The to-hit probability

may also be randomly adjusted up or down due to inexplicable factors. The computer considers the final probability and assesses a hit or a miss with a figurative die roll.

If the target is hit, a damage probability is calculated based on a comparison of ammunition effectiveness versus target armor protection. The angle of fire on the target is also considered since armored units normally have the most armor in the front, less on the sides, and least in back. Infantry units also often end up in a makeshift position with most cover to the front, less to the sides, and least in the rear. The computer compares a random number to the damage probability and assesses damage, no damage, or a kill.

Some or all infantry being transported by a damaged or destroyed vehicle may become casualties. Any surviving infantry will appear on the map as suppressed units. Surviving crew members are not gamed.

20.3 Terrain Scale

One screen pixel equals ten meters (for Type1 and Type2 maps). A screen pixel is normally the amount of screen covered by a period character.

20.4 Time Scale

A Combat Phase lasts one scale minute. During a Combat Phase, a clock in the information window advances in four, fifteen-scale-second pulses, however internal game calculations progress in one scale-second increments. One scale-second is the smallest possible measurement of any game activity. The real world pace of execution of a Combat Pulse varies. If the computer isn't working too hard, one minute of scale time can pass in a few seconds of real time. If the computer is processing heavily, or if there are a lot of digitized sounds being played a scale minute may equal several minutes of real time.

20.5 Computer Control During Combat Phase

During the combat phase, every unit is repeatedly examined by the computer to determine if it is eligible to do something (fire, move, change disposition, etc.) as the internal "seconds" timer advances. If eligible, it does one to fifteen scale-seconds of some activity. If not eligible, it is skipped and the next unit is examined. When all units in both armies have had the opportunity to perform fifteen seconds of activity, the control timer is advanced fifteen scale-seconds. "Eligible" means that enough scale-seconds have passed for the unit to accomplish its next ordered task. Example - if a unit is moving in terrain that requires several scale-seconds to move the distance of one pixel on the screen, then the unit will pause until the appropriate time has passed and then its symbol will be redrawn at the new location, one pixel distant.

20.6 Color, Memory, and Speed

TacOps is optimized for 256 color mode. The game will run at monitor settings greater than these, but the graphics will not be significantly different, much more memory will be required, and the game may slow unacceptably on older computers during the combat phase.

20.7 Panic Button/I Can't Get There From Here

If you can not quit a window or menu item or complete a required mouse or keyboard procedure, try clicking the mouse on an empty place on the map, or try pressing the escape key, the return key, or the enter key. One of these should back you out of the problem.

20.8 UTM Grid Coordinates

An explanation of the grid coordinate system used in TacOps follows. Being able to accurately specify unit positions in a text message is useful to players of team games, creators of custom scenarios, and for email coordination. Please read this section several times, all the way through, before banging your head on the wall in frustration. Using the military grid coordinate system is simple only after you know how to do it and have actually used it a bit.

Locations on military maps are found by using a grid reference system. The most common grid reference system is the Universal Transverse Mercator Grid (UTM). Military maps are usually printed with a UTM grid of horizontal and vertical lines overlaying the map terrain. Vertical grid lines are called Easting lines. Horizontal lines are called Northing lines. These lines intersect to form 1000 meter squares called grid squares. This is what you see in TacOps when you select the **Map/Show 1000m Grid** menu item. Numbers are printed on some of the lines to establish a grid numbering system. This is what you see in TacOps when you select the **Map/Show Grid Coordinates** menu item.

Map locations are commonly stated as a grid coordinate consisting of four, six, or eight numbers. These numbers represent the nearest intersection of Easting and Northing grid lines that is below and to the left of the point being located on a map.

Four numbers identify a 1000 meter grid square. Using four numbers specifies a point only to the nearest 1000 meters. 1000 meter grid squares are usually already printed on the map.

Six numbers identify a 100 meter square within a 1000 meter grid square. Using six numbers specifies a point only to the nearest 100 meters. 100 meter squares are not printed on the map. They must be visualized by mentally dividing 1000 meter grid squares into 100 small squares. You are unlikely to need eight number grid coordinates in TacOps, but eight numbers similarly identify a 10 meter square within a 100 meter square.

The left most numbers in a grid coordinate are Easting line numbers. The right most numbers are Northing line numbers.

Grid coordinates are anchored to the lower left corner of a given map or a given square. When reading grid coordinates, start in the lower left corner of the map and use the phrase "READ RIGHT UP" as a guide to matching text grid coordinates to the grid lines on the map. "READ RIGHT UP" means to read right until finding the correct Easting line, then read up until you find the correct Northing line.

Below is a section of a TacOps map containing three units. It has Easting lines numbered 03, 04, and 05. It has Northing lines numbered 05 and 06. Notice that grid line numbers increase from left to right and from bottom to top.
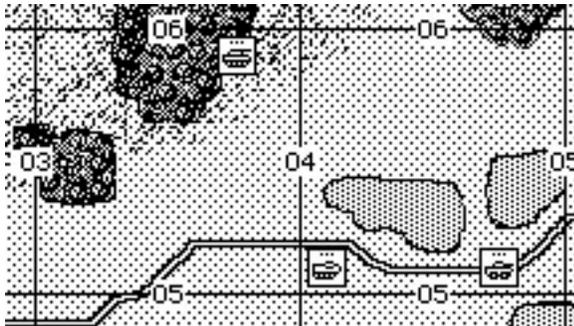
 If you only use four numbers to indicate map location, the center of the tank unit is located in or at grid 03 05. READ RIGHT UP - start in the lower left corner of the map and read right to Easting line 03, then read up to Northing line 05. The AAV7 unit and the LAV25 unit are both located in or at grid 04 05. Notice that the tank unit is actually located about 900 meters away from its four number grid coordinate. As you can see, identifying a unit position using only four numbers will not usually be very accurate.

Below is the same map with the terrain removed and with a "mentally visualized" smaller grid of 100 meter squares added.
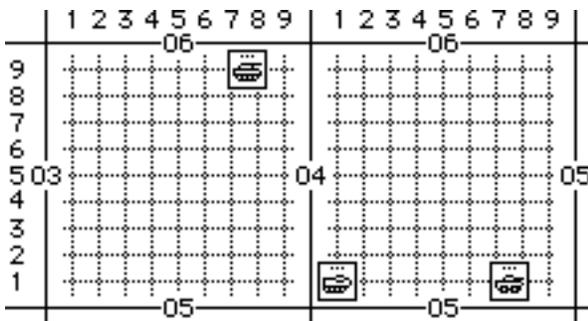
Notice that the 1000 meter squares have been divided so that there are now 10 Easting lines and 10 Northing lines inside each 1000 meter square. Now you can use six numbers to locate a unit on the map. The tank unit can now be said to be located at grid 037 059. Start in the lower left corner of the map and read right to Easting line 03, continue reading right to "mentally visualized" Easting line number 7. This gives you the 037 part of the grid coordinate. Next, read up to Northing line 05, then continue reading up to "mentally visualized" Northing line number 9. This gives you the 059 part of the grid coordinate. The AAV7 unit is located at grid 041 051 and the LAV25 unit is located at grid 047 051.

If you extend the example to eight numbers the tank unit is located at grid 0376 0590. The AAV7 unit is located at grid 0410 0510 and the LAV25 unit is located at grid 0475 0510.

A space was put in the middle of the grid coordinates shown above for learning purposes. Military users seldom, if ever, split a grid coordinate with a space or any other character. The grid numbers shown on TacOps maps do not necessarily correspond to any actual UTM grid numbers.

21. Designer's Notes

The graphics in TacOps are subdued for a number of reasons but the primary driving force was to allow the average user to have a game with a decent appearance that does not crawl and does not hog disk space. The information windows are undecorated for functional clarity. Map colors are mostly light pastels because large areas of bright color become annoying to many people after several hours of viewing. The art palette was limited to a minimum set of colors to maximize screen drawing speed and to reduce demands on the user's disk storage space and system memory. TacOps can be a very busy game, particularly in the larger scenarios that may have a hundred or more moving units per side. Speedy animation on that scale makes heavy demands on processors. One of my design philosophies is to program for last year's average computer, not next year's. The benefit of this to owners of older machines is obvious. However, it also benefits those owners of newer computers that have an older machine gathering dust in the corner. They can invite someone over and get some more use out of that dusty veteran via two player network games.

The factory defaults for user preferences automatically give thermal sights, and advanced ATGM warheads to OPFOR. The reason for this is to setup a balanced game rather than a simulation "right out of the box". The US M1 tank is the primary problem child for providing game balance. Unless advanced warheads are given to OPFOR, the M1 tank is practically invulnerable to most of the currently fielded OPFOR anti armor weapons - at least to frontal attack. If a "simulation" is wanted more than a "game" you only need to change the factory defaults.

Some dedicated wargamers may wish for detailed paper tables of weapon probabilities and listings of the rules that control the inner workings of the game. Not providing this information beyond a superficial level was an early, conscious decision. I believe that in a good computer wargame, the player should be able to concentrate on tactics and not have to be concerned with tables and rules. The conduct of war has general principles that if followed will contribute toward success but perfect information and hard and fast rules can seldom be found. TacOps, at the code level, is a very complex simulation of tactical combat. Its design places a priority on portraying ground combat realistically with some tradeoffs for playability and speed. My goal is for the game to be accurate enough that what should work or happen in real life is what should work or happen in the game - most of the time. Learning what works is part of the game.

Unit organization, the inclusion of certain weapons, vehicles, and units and the exclusion of others are difficult decisions. There is not perfect standardization throughout the US military, let alone the OPFOR. The inclusion of future weapons is particularly difficult as weapons under development are continually being superseded by new innovations. Some of the near-future systems are so much better than the old that not including them would seriously affect lessons to be learned from game play. Some future weapons that appear certain to be implemented have been included in every scenario - improved armors, advanced TOW, and Javelin for example. Others such as the LAV assault gun and LAV air defense variants, and smoke that defeats thermal sights are only available as options. I hope that slight errors in this area will be forgiven as my crystal ball algorithm is not foolproof yet.

Some command, logistic, and support unit markers such as medical sections, tank retrievers, cargo vehicles, fuel trucks, and the like are included in the TacOps data base. These units usually do not have their real world special abilities and they seldom appear in a factory provided scenario. These units were provided primarily to support the game's use by gaming clubs and by active duty military personnel in training situations.

Uncertainty and variability are key elements of tactical combat. This is portrayed in TacOps by inconsistency in unit performance, visibility, spotting, and weapons effectiveness. Your units and the enemy's will not always behave exactly the way you want them to - obvious targets may be ignored, easy targets may be missed, seemingly impossible kills may happen, individual units may achieve heroic results for a while and then seem to inexplicably lose efficiency.

Your units do not share your eagle's view of the map. You as the commander may be able to see an enemy unit on the map but that does not mean that every one of your units can see it, or that they are in a position, mode, or even mood to engage it.

Terrain by nature is irregular. Minor, local features such as folds, rubble, small patches of vegetation, slight rises, depressions, and the like regularly cause friendly and enemy units to drop in and out of sight as they move. This uncertainty is addressed by the program with random changes to spotting and firing routines as units move.

Off map artillery and air support are handled in a conceptual manner in TacOps. In the real world there never seems to be enough fire support to go around. What there is, is shared among many competing units. The unit with the greatest need usually gets the support but still, availability and capability often vary from moment to moment. In TacOps, off map artillery and air support are not really meant to represent specific, dedicated units, instead they are shown as momentarily available levels of destructive capability. The TacOps method of calling for fire support is not intended to replicate real world procedures down to the second. For example in real life you can not shift rounds that are already in the air from one target to another and you can not instantaneously change the ammo being fired. That it appears that you can do this in TacOps is merely a playability compromise. During development, air and artillery coordination were once treated with greater detail but playability suffered enormously and the greater detail was not found to add to the realism of the game results.

There is some controversy on the speed with which an effective artillery delivered minefield can be laid and on the time required for such mines to arm. I have conflicting expert testimony. One artillery officer stated that several batteries would have to fire for at least half an hour to lay an effective barrier minefield - less effort would produce only a nuisance field. Another artillery officer felt that a decent field could be laid virtually instantly given a high enough priority and a regimental sized time-on-target mission and that enough mines would arm quickly to be quite effective. I compromised by implementing the placement of artillery minefields during the first orders phase. This will not satisfy those, like myself, who want to drop mines into the midst of advancing formations, but I currently have no convincing evidence to indicate that effective use of such a tactic is realistically possible.

I think you will find that the most exiting and realistic games will be those in which you resist the temptation to display unspotted enemy units and instead play in the blind or fog-of-war mode. Reconnaissance, observation, and maintaining contact are a major part of real-world tactical operations. Use the fog-of-war option and you will rapidly learn how challenging and important maintaining contact is. Playing the computer opponent without fog-of-war is not usually much of a challenge - certainly beneath the abilities of a military professional.

You should be able to play the computer opponent in each scenario many times without the game flow in that scenario becoming predictable. Each scenario that features a computer opponent has several different OPFOR opening moves and tactical strategies - some have over a dozen. The computer opponent's opening move, initial tactical plan, level of aggressiveness, flexibility, and sometimes its overall competence are selected at random. When attacking, the computer may use different entry points and march routes from game to game. The computer's reaction to contact will vary from apathy to pile-on frontal attack - a word to the wise, watch your flanks and rear. Occasionally the computer may even withdraw to regroup. Companies or battalions attacking on different routes or defending in different areas may or may not come to each other's assistance. When defending, the computer may have several different initial setups. The computer opponent may defend in place or it may withdraw by bounds or it may do the former in one area and the latter in another area. The computer opponent may do the tactically wise thing in a given situation, or it may not due to restrictive orders from "a distant higher headquarters" - a frequent unfortunate occurrence in real life. Counterattack forces may or may not attack. The computer opponent was written to provide realistic uncertainty. It was not necessarily written to do the best thing, every time as that would also tend to be the same thing every time. If the computer opponent always did the "best thing" then its actions would become predictable and the "best thing" would become the "worst thing" - getting deep here. The AI does not "cheat". The computer opponent plays by the same rules and under the same constraints as the human except for three things: it has been given a slight advantage in initial artillery accuracy and in the distance at which vehicles may load infantry, and the computer opponent always plays under "fog of war" constraints even if the human has turned off fog of war in order to see OPFOR units at all times.

Important. The computer opponent selects its opening move and initial strategy at the beginning of the setup turn. Saving a game in progress also saves that opening move and strategy. So if you restart a saved game file, the computer opponent will always use the same opening move and the same initial strategy. The replayability of the scenarios will suffer if you try to shortcut the game startup process by saving a favorite starting setup for the Blue force. When you later start a new game by using that saved game file, you will generally see the same behavior from the computer opponent repeated over and over.

Most scenarios are balanced for play between two fairly skilled humans. If you are playing the computer opponent, you might add some of the optional OPFOR units.

The simplified approach to logistics and resupply in TacOps is a reflection of the short time limits of the average TacOps game. For most units and weapons, resupply is not relevant for only two or so hours of combat. The limited resupply allowed in TacOps is primarily intended to simulate two things, (1) a force in a defensive situation having extra ammo prestaged in or near

its fighting positions and (2) a force in an offensive situation carrying extra ammo. Use of the resupply capability can be very unrealistic at times. For example, a Bradley IFV with a full rifle team aboard is fighting a mobile battle far from its starting position. It runs out of missiles and is magically and illogically resupplied with a full load. Having the program track and prevent this kind of thing proved to be too complex and too prone to controversy. If situations like this bother you, just don't use the resupply feature. In two player games, you may want to discuss resupply and come to some sort of agreement or limit on its use. The computer opponent never resupplies its units.

If you wish to play a scenario with chemical weapons, biological weapons, nuclear weapons, total air superiority, or total artillery superiority you may use the following procedure. Select a scenario, then flip a coin and call heads or tails. If you call correctly, you may assume that your side has one or more of the above capabilities and you instantly win the game. If you call incorrectly, then your enemy has these capabilities and wins. If the coin rolls away and is lost then both sides are equally empowered and the game is a draw with nearly total casualties This approach saves a great deal of time in tactical level wargaming and has allowed me to concentrate on coding a game that contains tactical challenge and uncertainty.

In my opinion, the optimum TacOps gaming experience is to play with full fog-of-war against a human opponent over a network or by exchanging orders by modem, by electronic mail, in person, or by mail - in that order. Go to the trouble to find a human to play, schedule a lengthy game session and be social - your gaming life will be better for it.

Best regards, Major H.
aka I. L. Holdridge, Major, USMC (retired)
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Appendix A - TacOps Tutorial

This is a hands-on tutorial on how to play TacOps. The tutorial offers the fastest path to enjoyable play. The mouse and dialog procedures used to give orders to your units are simple and quick once you understand them, but they may be hard to grasp if you skip the tutorial. The tutorial assumes that you are familiar with your computer's operating system and that you know how to open, close, save, and quit programs and how to use a mouse with windows and dialogs. If you are not familiar with these operations or the terms open, close, select, drag, click, menu, window, and dialog, please refer to your computer's operating system user's guide.

IMPORTANT. There is an information bar at the bottom of the TacOps screen. You should watch that area carefully while you are learning the game interface. You will usually find a textual hint there on what to do next when the program is waiting for input from you during a multistep procedure. At other times you will see useful notes about what is going on in the game as well as information about friendly or enemy unit markers.

Starting the Program

▶ Load and run the program by double-clicking on the TacOps program icon or by selecting TacOps in the Windows Start menu.

A dialog will appear asking you to choose between playing a solitaire game, a two player game using one computer, a game using two or more computers linked by a Local Area Network, or a two player game using mail or Email.

▶ Select **Solitaire**

➤ Select **Standard Scenario**

➤ Select OK

The standard dialog for opening files will appear.

➤ Open the folders TacOps/Battles/US. Double-click on the file titled "Basic Training US.sec" [Macintosh - "Basic Training US"]. This will load the Basic Training scenario.

After a brief pause, the screen will display the battle map.

Battle Map Terrain Features
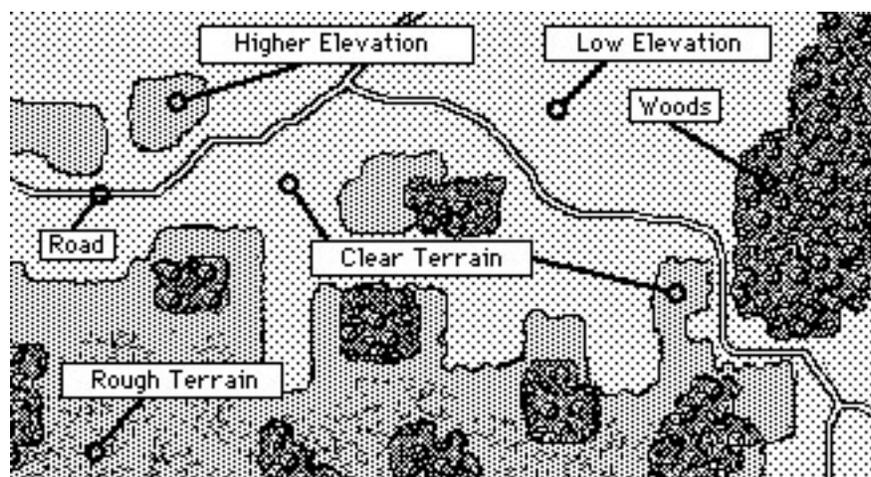
Areas with regular dot patterns are clear, even terrain. Areas with a jumbled dot pattern are rough, uneven terrain. There are two terrain elevations in TacOps - low and higher. Light color marks low ground. Dark color areas represent higher ground. The very dark and irregular areas are woods. Roads are black bordered, white lines. Movement is fastest on a road, less in clear terrain, much less in rough terrain, and slowest in woods. A unit is most visible to the enemy (i.e. likely to be seen and fired on) in clear terrain, less in rough terrain, and least visible (sometimes invisible) in woods. In all terrain, a firing or moving unit is more visible than a non firing or stationary unit. Range or distance also effects visibility. The greater the distance, the less chance there is of being seen.

Important note: if a unit's center point is in town or woods terrain and it is more than 100 meters from the edge of the town or woods, the unit will not be able to see out of the town or woods nor can it be seen by non adjacent units.   However, a unit whose center point is positioned in the first 100 meters (ten pixels) along the edge of woods or town gets the benefit of being in the woods or town for defensive purposes and can both see out and be seen.

High ground in TacOps has a similar 100 meter zone along the contour lines. A unit whose center point is located in the first 100 meters of high ground (i.e. up slope from the contour line) can see into low ground and into high ground and can be seen from both low ground and high ground. Beyond 100 meters it can only see high ground and can only be seen from high ground.

You will need to experiment a bit to get a good feel for how wide these special areas appear on your monitor. Use the **Map/Line of Sight Check** menu item for help in this.

Scrolling the Map

The map window shows only a portion of the available battle area. To view other portions of the map you scroll the screen with a hand-cursor (as in many 'paint' programs), or by using the scroll bars on the right and bottom of the screen, or by using the keyboard arrow keys. Follow the instructions below for scrolling practice. For now, avoid clicking in the dialog that you see in the upper left corner of the screen.

To practice screen-hand-scrolling, press the space bar once.

A hand-shaped cursor will appear on the screen.

Press and hold down the mouse button. Move the mouse to the left a couple of inches and release the button.

The map should slide to the left revealing new terrain on the right side of the screen. If you inadvertently double-click the mouse or press the space bar again, the hand will disappear. Just bring it back with another press of the space bar.

Repeat in other directions until you are comfortable. When finished, hand-scroll the map window to the upper left corner.

If the hand is still visible on the screen, either click the mouse button or press the space bar until the hand disappears.

To practice arrow-key-scrolling, press the left, right, up, and down arrows on the keyboard.

The map should slide left, right, up, or down with new terrain appearing with each key press.

Repeat in various directions until you are comfortable. When finished, arrow-scroll the map window back to the upper left corner.

Initial Unit Setup
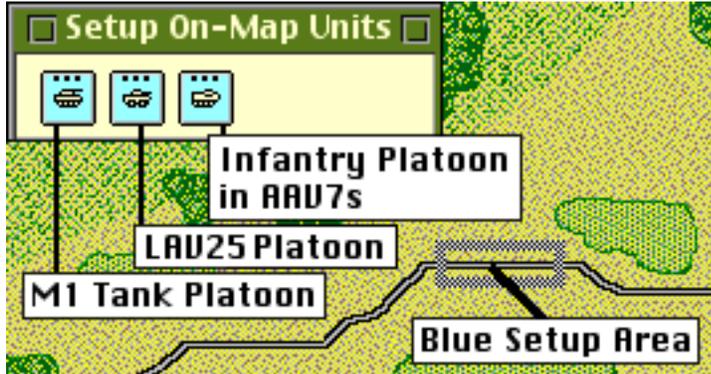
You should now see on your screen a window similar to the one above. This is the **Setup Window**. The **Setup Window** contains the units available to you for this scenario. Each small square with a vehicle or personnel silhouette in it is a unit. The small gray rectangle on the right is a Blue Force setup area. Opposing Force (OPFOR/Red Force) setup areas are black. Whenever you see such a rectangle at the beginning of a scenario you must start your units within its limits. Usually your setup up area will be much larger and may consist of several rectangles or polygons in different areas of the map. Sometimes there will be a deployment limit line that runs the length of the map. If so, you may setup anywhere on a specified side of that line. If there is more than one start-up area, you are free to place your units in any or all of them. The first time you play a scenario, you should scroll the map around a bit to make sure you are aware of all the possible setup areas. Notice that the **Setup Window** can be dragged if you want to view or put a unit in the terrain that it covers.

▶ Drag the **Setup Window** around a bit. Return it to the upper left corner when satisfied.

Notice that the **Setup Window** contains three units. The left most unit is a M1 tank platoon, the center unit is a platoon of Light Armored Vehicles Model 25 (LAV25), and the rightmost unit is a platoon of Assault Amphibian Vehicles Model 7 (AAV7). You can't see them at this point but the LAV25 and AAV7 units are transporting several infantry units. You will learn later how to unload an infantry unit from a vehicle.

▶ Move the cursor to the LAV25 unit symbol and click the mouse button once only.

The LAV25 symbol will be highlighted to indicate that it has been selected.

▶ Move the cursor to a point just inside the right edge of your setup area on the map - inside the gray rectangle - and click once.

If you clicked correctly within the setup area, the LAV25 symbol will move from the **Setup Window** to the point where you clicked in the map window.

If the unit did not go exactly where you thought it would, you can reposition a unit on the map by clicking once on the unit and once on the map at a new point.

➤ Click once on the LAV25 unit symbol that you just placed in the setup area.

The symbol should be highlighted.

➤ Move the cursor to the left side of the setup area and click the mouse button once.

The unit should move to the new setup point.

➤ Return the LAV25 unit to the right side of the setup area.

➤ As done with the LAV25 unit, place the M1 tank unit at the center of the setup area and place the AAV7 unit on the left side of the setup area in the **Map Window**. For each unit, click once on the unit symbol and once in the setup area.

When the last unit has been moved from the **Setup Window** to the **Map Window**, click in the close box of the **Setup Window**. The window will disappear.   With the **Setup Window** gone, clicking on a unit will no longer select that unit for repositioning. In order to reposition a unit now, you must hold down the shift key as you click on the unit. If you don't hold down the shift key as you click on a unit, a **Unit Orders Window** will appear. For now, if you should inadvertently open a **Unit Orders Window** just close it.

Your deployment should look as shown above. If it does not, you should reposition your units. Remember, to reposition a unit now, you must hold down the Shift Key as you click on the unit symbol.

➤ Hold down the Shift Key while clicking once on the M1 tank unit symbol.

The M1 unit symbol should be highlighted. [If instead a **Unit Orders Window** appears, it means that you did not hold down the Shift Key while clicking (or that your Caps Lock key is engaged) - close the window and try again until you get a highlighted unit symbol.]

➤ Move the cursor slightly to the left or right and click once again.

The M1 unit symbol should move to the designated point.

🖰 Hold down the Shift Key while clicking once on the M1 unit symbol. Move the cursor slightly to the center of the setup area and click once again.

The M1 unit symbol should move to the designated point.

Giving Orders to Units

[Note: The simplified tactics shown in this tutorial are inappropriate for most combat situations and are intended only to illustrate as simply as possible the game procedures for giving orders to units.]

You are now in the initial **Orders Phase** of the game. You are going to give orders to the LAV25 unit to conduct a road reconnaissance in an easterly then north-easterly direction. The top of the map is north, the right side is east, left west, bottom south. The LAV25 unit symbol represents three vehicles, each carrying an infantry team. The road is the white line bordered in black that should be passing under the LAV25 symbol. The only orders that you will give will be movement orders.

🖰 Click on the LAV25 unit (do not hold down the Shift Key).

The unit should be highlighted and a **Unit Orders Window** like the one above will appear. If the highlighted unit is covered by the **Unit Orders Window**, scroll the map a bit and or drag the **Unit Orders Window** about until you can see the unit.

Once the **Unit Orders Window** is on the screen, any click made on the map while an arrow cursor is visible will give the highlighted unit an order to proceed to that point. A unit can store up to 20 orders and will later execute them in the same order as entered.

🖰 Click once on the map at each of the numbered points shown below, in order from 1 to 6.
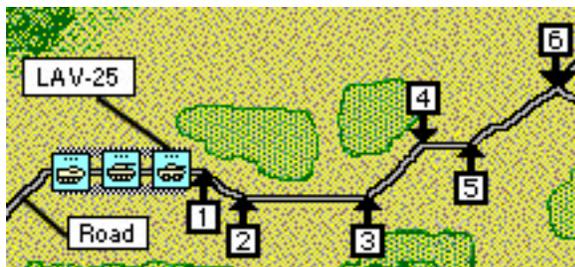
You just gave a series of movement orders to the LAV25 unit to move to point 6 by way of points 1 through 5. These orders will not be executed until the **Combat Phase**. The box in the **Unit Orders Window** labeled **Orders** shows how many unexecuted orders the unit has. It should now have a 6 in it. If it has more or less, you will have a chance to correct this shortly. You will preview the orders list by clicking the button labeled **Demo Move**.

➤ Click once on the button

The **Unit Orders Window** should have disappeared and the unit should have moved along the road to point 6 by way of points 1 through 5. As the unit ended its demonstration, the **Unit Orders Window** should have reappeared. You can stop a demonstration in progress by clicking the mouse before the unit executes its last order. Be careful though, if you click just as the demo ends you may inadvertently insert another movement order.

➤ Click once on the button . As soon as the unit starts to move, click again.

The movement demonstration should have stopped immediately and the **Unit Orders Window** should have reappeared.

Deleting Or Changing Movement Orders

 Look at the box labeled **Orders** in the **Unit Orders Window**. The number inside shows how many orders the unit has - 6 in this case. The button labeled "-" on the left of this number will delete the last order in the unit's orders list. If you click the button labeled "X" , all orders in the orders list will be deleted.

➤ Click once on the button.

The number in the orders counter should have changed from 6 to 5. The unit now has 5 orders.

➤ Click once on the button.

The number should have changed from 5 to 0. The unit now has no orders. You will now need to restore the orders that were deleted.

▶ As you did before, click once on the map at each of the numbered points shown above, in order from 1 to 6.

The orders counter should show 6 orders. Check your orders with the **Demo** Button.

▶ Close the **Unit Orders Window**.

The **Unit Orders Window** should have disappeared. Normally you would be free to give orders to any or all of your units but for tutorial purposes you should stop with the LAV25 unit.

Starting the Combat Phase

You are about to activate the Combat Phase. The Combat Phase is completely automatic. Once you start the Combat Phase, you are not permitted to give or change orders. You can scroll the screen to better view the action, but you can not do anything that will influence the action.   The Combat Phase will last for one scale minute. You will be advised when it is over by a beep and a message at the bottom of the screen.

The computer resolves combat randomly based on the percentage chance of a given event happening under various circumstances. Accordingly, the Combat Phase may not turn out exactly as described below. From this point on, don't worry if the tutorial illustrations don't match your screen perfectly or if you can not follow the instructions exactly because a unit has been eliminated, just do the tutorial activity with another unit. The important thing is to follow the general guidelines while learning the game mechanics.

This is approximately what you will see during the Combat Phase if you have given the correct 6 orders.   The LAV25 unit will move East along the road. As it moves past the protection of a small hill it will be fired on by a T80 tank and a BMP2 armored personnel carrier. The LAV25 unit may lose a vehicle or two. You may see surviving infantry bail out of burning vehicles. The LAV25 unit may fire several times at the BMP2 but will likely not get a kill. Whenever a unit fires you will see a line drawn from the firing unit to its target (see illustration below). You will also see a brief message at the bottom of the screen naming the firing unit, the weapon in use, the angle of possible impact on the target unit (i.e. fire is against the front, side, or rear of the target), and the range. Sometimes the action and messages may be rapid. If you want to pause the action , just press the space bar as if to initiate a hand-scroll. As long as the hand-cursor is on the screen, all game activities stop. To continue, press the space bar until the hand disappears.
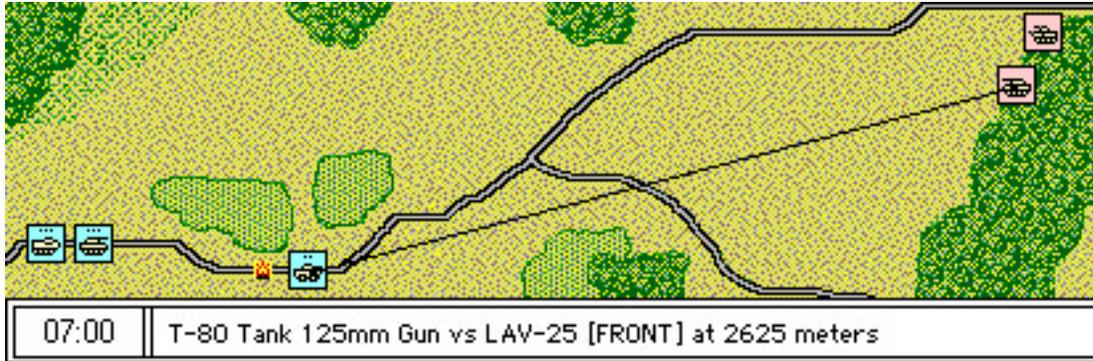
07:00 | T-80 Tank 125mm Gun vs LAV-25 [FRONT] at 2625 meters

➤ Select the **'Begin Combat Phase'** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

You are now again in an **Orders Phase**. Your screen should show a scene like the one in the left corner of the next illustration.

➤ Open the **Unit Orders Window** by clicking on the LAV25 unit. Scroll the map and drag the **Unit Orders Window** so that your screen matches the next illustration.

Note that the orders counter probably shows 3 or 4 orders. During the Combat Phase the LAV25 probably completed 2 or 3 of its 6 movement orders. As a unit fulfills an order during the Combat Phase it automatically deletes that order. Unfulfilled orders remain in the list and if not changed will be acted on in the next Combat Phase.

You will now try to get the LAV25 out of trouble with a smoke screen and a fast dodge behind a hill.

You want to order the LAV25 to fire smoke grenades and retreat, but first you need to get rid of the three orders still in its orders list. Your units execute their orders in a first-in-first-out

sequence. If you don't cancel the leftover orders from the last Orders Phase the LAV25 will continue on toward the enemy.

➤ Click the button ⊠ in the **Orders** box so that the number in the box shows zero.

➤ Click the smoke button 🆂🅶 in the Delayed Orders Controls box.

You just ordered the unit to fire smoke grenades or smoke dischargers.

➤ Click on the map at points 1 and 2 (in that order) as shown on the right. Be careful not to click in the gray area that marks the high ground or you may stray back into sight of the enemy.

You just gave two movement orders.

The **Unit Orders Window** has two kinds of buttons - delayed action and instant. Only the buttons inside the box labeled **Delayed Orders Controls** give orders that will be executed during the Combat Phase. All other buttons produce an instant, observable action during the Orders Phase.

The orders counter should now show 3 orders.

➤ Double check your orders by clicking the **Demo Move** button.

Once again you will only give orders to the LAV25 unit. For now, leave the M1 tank unit and AAV7 unit alone.

➤ Close the **Unit Orders Window**.

➤ Select the **Begin Combat Phase** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

The LAV25 unit may or may not have made it to safety. You may have seen the enemy T80 tank and BMP fire on and even hit the LAV25 right through the smoke. If so, you have now learned that these units have thermal imaging sights that can see through smoke - a rough lesson. At the time of publication these units were not known to actually have thermal sights although it was known that OPFOR had the capability to add them. Many US units have thermal sights and in order to provide a more even game, a preference option was added to TacOps that gives them to

OPFOR also. You have the freedom to take them away if you are more interested in a simulation than in an even game. Consult the User's Guide for instructions on changing the preference settings.

You are again in an **Orders Phase**. You are going to order the M1 tank and AAV7 to move north until they are screened by woods and then move east through the woods to a firing point closer to the enemy. You are impatient, so you will charge across the enemy's open front, with no screening smoke and no supporting artillery fires.

▶ Click on the M1 tank unit to open its **Unit Orders Window**. Scroll the map and drag the **Unit Orders Window** so that your screen is similar to the scene above.

▶ Click the button   Unit Info

A window will appear with information about the M1 tank unit.

Information shown in the window's title includes:

- The type name of the unit.
- The center of the unit is located at UTM grid coordinates 038051.

Information shown on the left side of the window includes:

- M1 tank unit is made up of 4 vehicles.
- Unit identification number is 1.
- Unit is on a road in clear terrain.
- Unit is likely to be spotted at 3000 meters.
- Unit is at elevation level 0 (There are two levels - 0 is low ground while 1 is higher ground).
- Unit is undamaged and not suppressed.
- Unit is equipped with thermal imaging sights.
- Unit is not amphibious.
- The total number of crew members in the unit is 16 (4 in each tank).
- Unit can transport a total of 48 infantrymen (12 on top of each tank - carrying infantry on tanks is possible but it is often not a very good idea).
- Unit is transporting no infantry.

Information shown at the top center includes:

- Unit's basic level of armor protection on its front, sides, and rear against kinetic energy weapons (solid penetrator) and chemical energy weapons (high explosive, shaped charge). The number expresses the protection level in millimeters of Equivalent Homogeneous Rolled Steel Armor (EHRSA) (standard steel armor) and may not represent the actual armor thickness of the armor material at all. For example, aluminum armor will have a EHRSA number much lower than its actual thickness. The EHRSA number also includes average armor slope, if any. Some units with special, high tech armor have different levels of protection against kinetic and chemical energy weapons.

Information shown at the bottom center includes:

- Unit has 3 smoke grenade fires left.
- A list of the major weapons in the unit, their maximum effective or useful ranges (not necessarily their technical maximum), and the total quantity of ammunition available for each.

▶ Click the button labeled "Info" located on the right side of the line describing the 120 mm gun.

A window will appear showing more detailed information about the capabilities of the M1's 120 mm gun.

```
┌──────────────────────── 120mm Gun M1A2 ────────────────────────┐
│                                                                 │
│ Minimum Range: 0     Useful Range: 3500                         │
│ Antiarmor Effect: Kinetic energy.                               │
│ Advanced penetrator                                             │
│ Range Reference Points:  0m     1000m  1500m  2000m  2500m  3500m │
│ Basic Hit Probability:   95%    90%    80%    70%    50%    15%  │
│ Armor Penetration:       680mm  670mm  660mm  640mm  620mm  580mm │
│ Note: All info is for direct fire only. Multi mode weapons have different range and ph │
│ for indirect and  AA fire.                                      │
│                                                                 │
└─────────────────────────────────────────────────────────────────┘
```

▶ Close the 120mm gun information window. The unit information window should reappear.

▶ Close the unit information window. The unit orders window should reappear.

You will now give orders to the M1 unit.

▶ Click on the map at points 1, 2, and 3 (in that order) as shown in the next illustration.
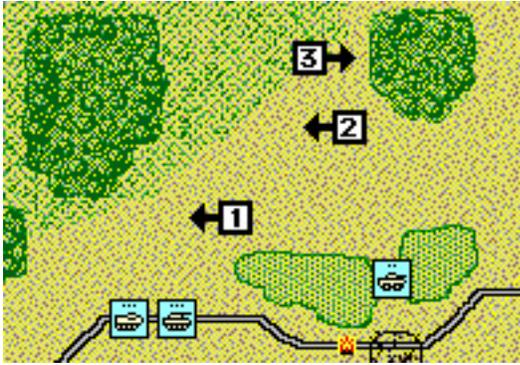
The Orders counter should now show 3 orders.

▶ Click the button [Demo] to check your orders to the M1 unit.

If the unit does not move properly, cancel its orders and repeat order entry.

▶ Close the **Unit Orders Window**.

You will now give orders to the AAV7 unit.

▶ Click on .the AAV7 unit to open its **Unit Orders Window**.

Note the line of text at the bottom of your computer screen. It is telling you that the AAV7 unit is transporting an infantry platoon, a machine gun team, a SMAW (Shoulder Launched Multi-purpose Assault Weapon) team, and a Javelin ATGM (Anti Tank Guided Missile) section.

▶ Click the button. [Unit Info]

A window will appear with information about the AAV7 unit. As you look over the window you will find a new information category. Underneath the Troops Onboard line is a summary of the infantry units being transported by the AAV7 unit.

The weapons list shows just the weapons of the AAV7 unit. In order to see the weapons of a transported unit you will have to wait until it is unloaded and you are able to open its **Unit Orders Window**.

▶ Close the information window.

The **Unit Orders Window** should reappear.

You want the AAV7 unit to accompany the M1 unit and follow the same route. However, the AAV7 needs to wait 30 scale seconds before it starts moving so that the M1 is well in front during the movement.

▶ In the **Delayed Orders Controls** box, click twice on the button that looks like a watch. This button will put a 15 scale second pause into the orders list for each click.

The Orders counter should now show 2 orders. You just told the unit to wait 30 scale seconds before it executes any more orders. You will now give it movement orders, but you will use a shortcut that will allow you to copy the 3 movement orders already given to the M1 unit.

The button labeled **Add Orders** starts a procedure that allows you to append the entire orders list of one unit onto the end of the orders list of another with one click. This is very useful for shortening the time needed to give orders in scenarios with many units. You will find that you will often be giving virtually identical orders to several units, particularly when you are moving a column of units down a road. Mastering the appending of orders (plus the other ways of copying and pasting orders as explained in the User's Guide) will save you a great deal of time. The unit with the **Unit Orders Window** on the screen will receive the appended orders. The orders will come from another unit that you will mark with a mouse click.

➤ Click the button [Add Orders].
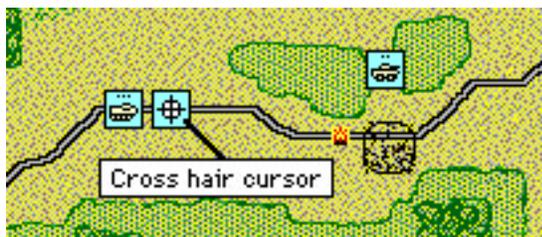
Cross hair cursor

The **Unit Orders Window** will temporarily disappear and the arrow cursor will change to a cross hair cursor. Whenever you see a cross hair cursor, the computer is waiting for you to click on a point on the map or on a unit symbol.

➤ Move the cross hair cursor to the M1 unit as shown and click once.

The cross hair cursor will change to an arrow cursor and the **Unit Orders Window** will reappear. You just appended the orders list of the M1 tank unit onto the end of the AAV7 unit's orders list. The **Orders** counter should now show 5 orders. Remember, you gave the AAV7 two delayed orders and then added three movement orders from the M1 unit. You should consult the User's Guide at a later time to learn other methods of copying, pasting, and appending orders.

➤ Click the button [Demo] to check your orders to the AAV7 unit.

If the unit does not move properly, cancel its orders and repeat order entry.

➤ Close the **Unit Orders Window**.

➤ Select the **Begin Combat Phase** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.
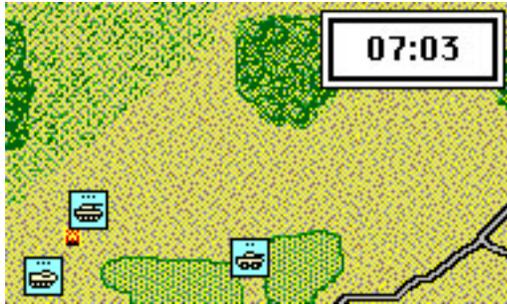
The M1 tank unit moved north followed by the AAV7. The M1 unit probably came under fire as soon as it cleared the small hill and may have taken some losses.

▶ Select the 'Begin Combat Phase' item in the Combat menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.
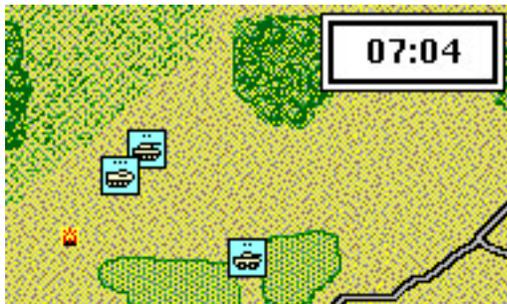
▶ Select the 'Begin Combat Phase' item in the Combat menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

The M1 and AAV7 continued north, ending the Combat Phase in the shelter of the western edge of some woods. The M1 probably came under fire again and may have lost another vehicle.

As both units have just about completed their orders, you will give each additional orders to move east through the woods to a position closer to the enemy.

Notice that the M1 and the AAV7 unit symbols partially overlap making it difficult to pick out the M1. When you need to pick a unit out of such a stack just click on the stack. If there is more

than one symbol underneath the click point, the stack will automatically spread out so that you can click again on the exact unit desired.

➤ Click in the center of the M1/AAV7 stack. When the stack spreads out, click on the M1 tank unit to open its **Unit Orders Window**. Cancel any leftover orders with the X button and give it three movement orders by clicking on the map at points 1, 2, and 3. Once the unit gets to point 3, you want it to find a final position that offers the best possible cover.

➤ Click on the **Seek Cover/Defilade** button ⬜ in the **Delayed Orders Controls** box.

This button orders a unit to seek cover or assume a defilade position. A defilade position is one that conceals a portion of the unit from enemy observation or fire. For personnel this represents going prone or seeking the protection of low spots, shell holes, boulders, fallen trees, etc. For vehicles this usually means placing the vehicle in a low spot so that the vehicle's hull is out of sight. In TacOps you can assume that a unit can always find something better than just parking in the open. Going into defilade requires a few seconds to accomplish but is always worth the effort.

➤ Close the M1's **Unit Orders Window**.

➤ Open the AAV7's **Unit Orders Window**, cancel any leftover orders, and use the **Get Orders** button to give the AAV7 the same orders that were just given to the M1 unit.

➤ Select the **Begin Combat Phase** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

The M1 and AAV7 moved east into the woods. As both were deep inside the woods, neither could be seen by the enemy and should not have been fired on.

▶ Select the **Begin Combat Phase** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

The M1 and AAV7 continued east through the woods. During the movement the M1 may have fallen behind the AAV7 unit. If so, this would be due to the M1 unit being suppressed or distracted by earlier enemy fire. The recent enemy fire that destroyed vehicles in this unit had the side effect of making the surviving crews more cautious. This unit will move less aggressively and may have some difficulty in acquiring targets until the suppression wears off. This may take several minutes.

▶ Repeatedly select the **Begin Combat Phase** menu item until the M1 and AAV7 units stop together on the east edge of a wooded area, as shown below.

By now the M1 and AAV7 units should be together on the east edge of the woods.

Saving a Game in Progress

A game in progress may be manually saved at any time during an **Orders Phase**.

▶ Select the **Save Game** item in the **File** menu. When the standard file window appears, type in a name to save the game under or just click OK for the default name of "savegame.tac".

Now that you have saved your tutorial efforts, a break might be in order. If you choose the break you may reload and continue the tutorial later with this saved game by clicking on the button in the opening screen titled **Saved Game**. You will return to the exact spot in the game that you are at now.

As you were selecting the **Save Game** item in the **File** menu, you may have noticed an item labeled **Auto Save**. Marking this item will result in the game being automatically saved at the beginning of every Combat/Movement Phase. **Auto Save** is the default setting and its use is very much recommended. Not only does it prevent the frustration of a long gaming session being lost if you lose power, the process of saving a game efficiently reorganizes the program's use of memory. This side effect can be very helpful to a computer with minimal memory. The file will be named "autosave.tac" and will replace any earlier automatic save file. You reload an automatically saved game in the same manner as a manually saved game.

Tactical Disposition Symbols

▶ Select the **Change Unit Symbol Info** item in the **Map** menu.

▶ Select the **Change Unit Symbols Info** item in the **Map** menu again.
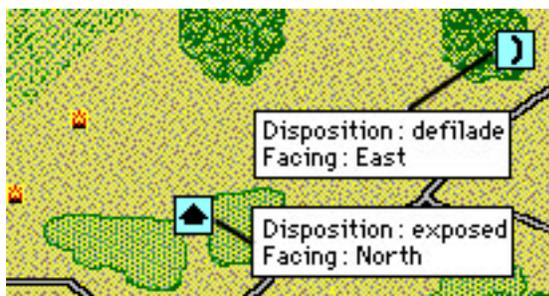
The **Change Unit Symbols Info** menu item changes unit symbols to tactical disposition symbols and back again. The M1 and AAV7 units should by now be in defilade (defilade is a tactical disposition) so they should show defilade symbols. The LAV25 unit was never given a defilade order so it still shows the arrow symbol which represents exposed disposition. The disposition symbols also reveal the direction that a unit is facing in. Facing is important because vulnerability to enemy fire varies according to facing. A unit is generally most resistant to fire to its front, less resistant on its sides or flanks, and most vulnerable from the rear. Use this feature to quickly confirm your units disposition/facing and to discover the disposition/facing of spotted enemy units.

▶ Select the **Change Unit Symbols Info** item in the **Map** menu again.

The unit symbols should have changed back to unit symbols.

Displaying the Map Grid

▶ Select the **Show 1000m grid** item in the **Map** menu.

▶ Select the **Show Grid Coordinates** item in the **Map** menu.
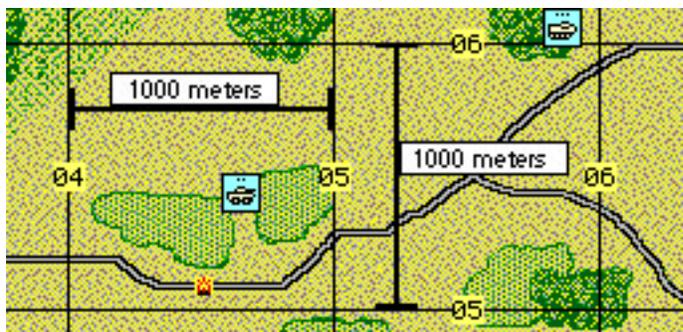
The **Show 1000m grid** menu item draws a grid on the map of squares 1,000 meters across. The grid is helpful in estimating ground distance and range between units. Precise distances can be measured with the **Line of Sight** menu item.

Confirming Line of Sight

Units can only see and fire at each other when there is a clear line of sight between them. Line of sight can be blocked by intervening woods, towns, large structures, and higher ground. The **Line of Sight Check** menu item allows you to drag a line across the map that reveals the range between the start and end points and indicates if the line of sight along the line is clear or blocked.

▲ Select the **Line of Sight Check** item in the **Map** menu.

A cross hair will appear on the map. While holding down the mouse button, click on the map and drag the cross hair around the screen. The range between the start and end of the line is shown at the bottom of the screen as well as the terrain elevation, terrain type, and the UTM grid coordinates of the end point. [UTM grid coordinates are explained in the User's Guide.] If the cross hair remains clear then the line of sight is clear. If the cross hair turns black then the line of sight is blocked. If the cross hair turns gray then there is a clear line of sight to a target point but the point is beyond the scenario's maximum visibility limit. Release the mouse button to quit.

You just checked the line of sight of a unit using normal day vision – in other words eyesight. Smoke will block normal line of sight. Smoke may or may not block the line of sight of a unit equipped with a thermal imaging device. To check thermal line of sight, select the **Thermal LOS Check** item in the **Map** menu. The routine works the same from this point on.

Unloading Personnel From Vehicles

 Click on the AAV7 unit to open its **Unit Orders Window**. Remember that when several units overlap, clicking on the stack will spread the units out for further selection.

You are going to instantly unload the troops carried inside the AAV7.

 Click the Unload button.
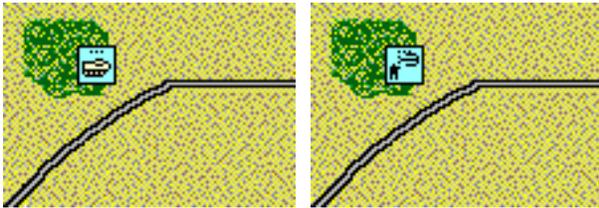
All units carried by the AAV7 unit were instantly unloaded.

 Close the AAV7 **Unit Orders Window**.

 Click on the stack of unloaded units to spread it out, select each unit in turn and look over its unit information by using the **Unit Info** button in its **Unit Orders Window**.

Setting and Adjusting Artillery Fire

➤ Select the **Artillery Support** item from the **Orders** menu.

The **Off-map Artillery Support Window** should have appeared. This window allows you to set and adjust artillery fire. Each line in the window represents an off-map artillery unit.
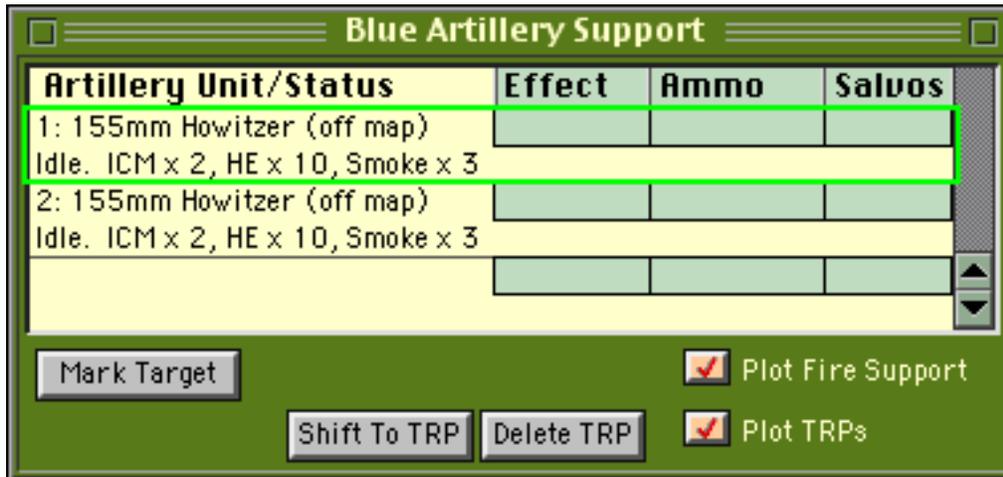
➤ Click in the top-left rectangle containing the words "155mm Howitzer".

This selects the first artillery unit.

You will now set an artillery fire mission target.

➤ Click on the **Mark Target** button inside the Artillery Support Window.

The **Artillery Support Window** disappeared. The arrow cursor changed to a cross hair. The program is waiting for you to click on the map where you want the artillery fire to impact.

➤ Click on the point shown in the illustration to mark the target.
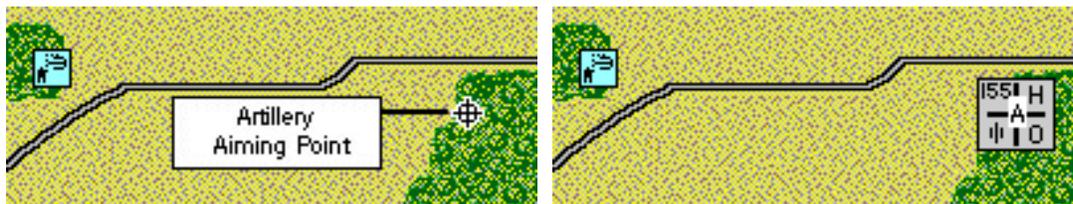
The cross hair cursor changed back to an arrow and the **Artillery Support Window** reappeared. The artillery aiming point is now marked with a target symbol. Until this mission is canceled or the artillery runs out of ammunition, the target symbol will be visible on the map whenever the

Artillery Support Window is open. The mission has been targeted but you must now specify how the mission is to be fired and what type of ammunition is to be used.

To the right of the artillery unit name there are three columns of blue gray boxes . One column is labeled "Effect", one is labeled "Ammo", and the third is "Salvos". The boxes in these columns are cyclic controls – each time you click in the box a different setting appears. Currently the topmost Effect box shows "Adjust" and the topmost Ammo box shows "HE". The first box is used to choose whether to fire adjusting rounds or to immediately fire for effect. Adjusting rounds are used to improve accuracy (assuming you have a unit observing the target) before expending large amounts of your artillery ammunition. In TacOps, adjusting rounds from off map artillery do not lower your ammunition supply when they impact, but they don't cause any casualties either. Fire for effect costs ammunition, but is the only way to inflict casualties. Normally you would allow a fire mission to impact a couple of times using adjusting rounds and then change to fire for effect.

For now, click on the topmost **Effect** box until it displays " **FFE"** (Fire For Effect).

The next cyclic control – the Ammo box – is used to select the type of ammunition to be fired. Repeated clicks on the control will usually show HE, then ICM, and then Smoke. Some artillery or mortar units will not have all three types of ammo. Notice that the line underneath the cyclic controls shows what types of ammunition are currently available and the ammunition supply (expressed as number of volleys) remaining for each. **HE** means ordinary high explosive ammunition (useful against personnel but not very effective against armor), **Smoke** is self explanatory (usually blocks line of sight), **ICM** is Improved Conventional Munitions (extremely effective against armor as well as personnel). The best ammunition to use against armor or personnel is ICM but for now choose HE [for tutorial purposes we don't want to eliminate the enemy units in the woods just yet].

Click on the topmost **Ammo** button until it displays "HE".

The last cyclic control – the Salvos box – is used to control the number of salvos that will be fired. Currently the box contains a question mark "?" which indicates "unlimited". When the question mark is showing then the artillery mission will be fired until it is canceled by the player or the unit runs out of ammunition. The other available settings are zero through five salvos.

Note that the **Artillery Support Window** now shows additional information about this fire mission - current accuracy level zero, one minute estimated time until impact, and type of fire.

The first number inside the brackets (currently [0]) indicates the mission accuracy level of an ongoing fire mission. Mission accuracy is a number between 0 and 5 that represents the number of times that the unit has delivered observed fire on the current target. The higher the number, the more likely the next impact will be on or near the target point. Artillery fire is "observed'" when any friendly unit has a clear line of sight to the impact point. Unobserved fire is usually very inaccurate.

Although the window may indicate one minute to impact, it could actually take longer. You won't be shown the exact time of impact unless it is less than sixty seconds away. A new artillery fire mission will have a preparation delay of some minutes before the first rounds impact on the map. Once the first volley has impacted, fire will continue at intervals of about thirty seconds (longer for smoke) until the artillery runs out of ammunition, the salvo limit is met, or you cease the fire mission.

If you did everything correctly, your screen should match the previous illustration. A target symbol will be visible on the map for each plotted fire mission as long as the **Artillery Support Window** is shown. Once you dismiss the **Artillery Support Window**, the target symbols will disappear.

▶ Repeat the steps above for the other artillery unit in the **Artillery Support Window**. Experiment with the **Cease Fire** and **Shift Fire** buttons and with the **Plot Fire Support** check box. Experiment with "right clicking" on a line in the artillery support window [Macintosh – hold down the Control key while clicking].

The **Cease Fire** button cancels the selected fire mission. The firing unit becomes immediately available for another mission anywhere on the map. Unit accuracy will be reset to zero and any new mission will suffer a preparation time delay.

The **Shift Fire** button is used to shift an ongoing artillery fire mission up to 1000 meters to a new target. The advantage in shifting fire over ceasing fire is that mission accuracy is reduced only one level per shift and there is little or no added time delay. Try shifting the same mission several times in a row. Notice that the shift limit is determined from the artillery target point that

was in effect at the beginning of the current **Orders Phase**. This prevents you from exceeding the shift limit of 1000 meters per turn.

The **Plot Fire Support** check box draws or hides existing artillery target symbols on the map. Sometimes you may want to see what is under a target symbol in order to better place another mission. Uncheck the box to hide all symbols - check the box to redraw them.

The remaining items in the **Artillery Support Window** are explained elsewhere in the User's Guide.

Notice that you can select an artillery unit by clicking on its name in the **Artillery Support Window**, or by clicking on its target symbol on the map.

Although you will not use it in this scenario, air support is targeted in a similar fashion by using the **Air Support** menu item and the **Air Support Window**.

▶ Once you are comfortable with the **Artillery Support Window,** cancel all fire missions and then reset the first artillery unit to the first mission described above.

▶ Select the **Begin Combat Phase** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

Nothing happened. The units have finished all their orders and the artillery mission hasn't arrived yet.

▶ Select the 'Begin Combat Phase' item in the Combat menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

The artillery mission should have impacted, probably with no visible effect. If none of your units can see an enemy unit at the target point then the program will not show you the effect of the strike unless a vehicle is destroyed.

The Charge
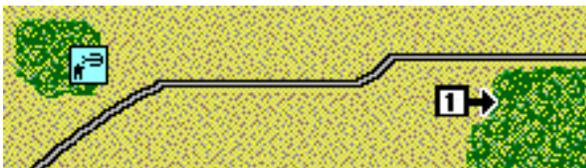
Time to clean out the woods.

▶ Open the **Unit Orders Window** by clicking on the M1 unit. Order the M1 unit to move toward the wood line by clicking on the map at point 1.

You just gave one movement order. You may have noticed that although you only gave one order, two orders are shown in the **Orders** counter. The program knows that a unit in defilade mode can't move, so it automatically preceded the movement order with an order to go into exposed mode.

▸ Select the **Begin Combat Phase** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.
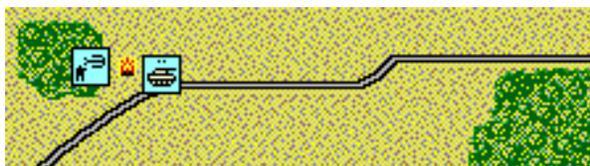
The M1 unit moved out of the woods toward the enemy. As soon as it moved out of the woods it became visible and came under fire. It may have taken losses. Once the enemy opened fire, they probably became spotted and should have taken return fire from the M1 and from the Javelin ATGMs that you left in the woods.

▸ Select the **Begin Combat Phase** item in the **Combat** menu. Watch the action and wait for a beep and a screen message signaling the end of the phase.

The M1 continued toward the enemy position. The firefight continued with probable losses to both sides. You probably knocked out the enemy tank and APC (Armored Personnel Carrier). Your M1 unit may or may not have survived.

Unless your artillery was unusually effective there should still be an enemy rifle squad near where the tank and APC were. Continue on your own and assault with your infantry. Follow this general outline: load your infantry back onto the AAV7, order the AAV7 into the enemy woods between the tank and APC wrecks. Don't forget to cease your artillery supporting fires before you get too close to the enemy position. When the enemy squad opens up on the AAV7, unload your infantry, cancel all AAV7 orders, and continue the assault on foot. In the future you should consider stopping and unloading APCs before they get in range of enemy light anti armor weapons, but for now just charge in amongst them.
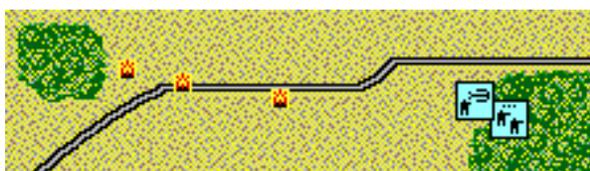
End of tutorial.

Appendix B - Strategy & Tactics Guide

Introduction

By Major Holdridge

This guide consists of a series of articles on the strategy and tactics of modern ground combat as they apply to TacOps. The articles were provided by expert TacOps players, experienced wargamers, and military professionals.

Generally speaking, you need to stay focused on your mission and your enemy's mission. In TacOps, scenario victory conditions are always stated as missions. Any action that does not support mission accomplishment will usually contribute to mission failure. There is usually more to a TacOps scenario than just charging directly toward the nearest enemy unit and slugging it out. Do not get drawn into firefights that do not contribute to mission accomplishment.

Always remember that mission accomplishment is the standard by which success or failure is judged. Focus your plan of attack primarily on the mission and secondarily on the enemy. Individual enemy units are only relevant to the degree that they can interfere with the accomplishment of your mission. Do not become so caught up in fighting that you forget your mission.

TacOps Combat Operations

By Kyle Mizokami

1. <u>Plan</u> before the battle. Look at the map, not only from your point of view but the enemy's. What are the preset conditions for victory? What is the terrain like? Those dictate the defense. Make a plan, with one main objective on the map and several smaller ones that lead to it. One step at a time; give everyone an objective to keep things moving. Despite the time and effort used in creating the plan however, don't be afraid to divert from it if an opportunity arises.

2. <u>Reconnaissance. reconnaissance. reconnaissance!</u> This is a job for your scouts—send them deep to gather information that will enable you to detect gaps in the enemy defenses. With that information you can shift your axis of attack if necessary, avoiding enemy strongpoints and finding targets for air strikes and artillery. It is also important to kill the enemy's own scouts and/or observation posts, especially before they detect the main body of your forces. Most units have a organic reconnaissance unit—reinforce that if necessary with extra units. Finally, put plenty of space between your scouts and main force, to give the main force time to shift direction if necessary, or back away from a hornet's nest.

3. <u>Speed. speed. speed!</u> Close with the enemy as quickly as possible—it's the safest thing to do. The closer you are, the more effective your weapons are, and your "dismounts" (infantry and weapons teams mounted in Bradleys, BMPs, and so on) become more relevant. Move fast so that his artillery can't get a good fix on you.

4. <u>Keep your artillery and air support moving,</u> and don't waste a single turn's worth of support. If your scouts survive, have them register Target Reference Points on likely enemy positions, so that Smoke, HE, or ICM can be brought to bear quickly if something really is there. If the enemy doesn't have thermal sights use smoke to screen your flanks or block the fire of an enemy unit you don't otherwise want to deal with. Use HE to hit infantry and other light units, ICM to shell enemy vehicles. Airstrikes are particularly good for rooting out troublesome defenses, but make sure enemy air defense has been suppressed.

5. <u>Deploy your air defenses to cover the advance.</u> Air strikes may hit you at any time, the worst times being while your vehicles are on a road, when they can bunch up accidentally, or while your forces are within meters of enemy lines and pressing home an attack.

6. <u>Move dispersed. fight concentrated.</u> When moving forward to make contact with the enemy, don't bunch your forces up, especially if the enemy has airstrikes pending, or artillery available (especially ICM and MLRS). When you do make contact, commit the entire force at once, adhering to the principle of mass, and send it at your objective full speed ahead, no stops. If necessary stop just short of the enemy's guns (and out of sight) and wait for the rest of your forces to catch up. The goal here is to concentrate your forces into one massive fist to smash the enemy, rather than hit him one finger at a time. (And to achieve the fist, concentrate your attack on a narrow front rather than a wide one. It's the difference between a slap and a punch.)

7. <u>Avoid the temptation to overuse roads.</u> Although the fastest route, the enemy invariably expects you to use roads even in the attack itself, and will position his forces accordingly. Move your forces down roads at first, but put some distance between you and the road before the attack commences.

8. <u>Create a diversionary force</u> and send it at the enemy about five minutes before the main attack begins. Send it at the enemy from a completely outrageous direction, where he would never dream you'd come from and defended lightly. He'll strip forces off his front line to meet the diversion, giving your main effort a better chance at success. At least that's the theory. If it ever works for anyone, please let me know.

9. <u>When advancing. hug terrain</u> that obscures your advance: woods, cities, and elevation changes. Don't go through them unless you have to: your attack slows down and your forces could be ambushed by infantry. If you have to deal with enemy forces in cities and forests, shell them with HE or screen them with smoke, but don't go after them with tanks.

10. <u>When your force first crests and comes into view of the</u> <u>enemy's main force</u>, do so in a way that as many of your forces come into view at once as possible. That way maybe some of them will survive the enemy barrage to spot and kill something.

TacOps Defensive Strategy

By Don Hill and Major Holdridge.
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Analyze the terrain. Identify high speed avenues of approach corridors where clear terrain or roads allow rapid movement to enemy units. Always cover these with observation and long range direct fire weapons and be prepared to move rapidly to block them with additional forces. Critical high speed avenues may need to be physically blocked by dismounted rifle units. Identify areas of rough terrain and try to channel the enemy into them by covering the easier routes with high accuracy long range weapons and or mines. An enemy armored unit moving slowly in rough terrain makes an easy target for artillery and air support. Rough terrain can often be initially defended just with observation posts, but be prepared to move in real fighting units as it becomes necessary. Compare the terrain against the enemy mission. You will often find that the enemy does not have the time or resources to use certain avenues of approach.

Analyze the general strengths and weaknesses of your units and those of your enemy. For example, if you are a Marine commander, you should recognize that Marine units have large footprints with more riflemen per unit and a good short to mid range anti-armor capability, but that they are often not very tactically mobile and are often weak in long range anti-armor weapons. Your worst problem may occur when OPFOR concentrates on one part of your defense since the rest of your force may not have the mobility to rapidly reinforce.

If you are commanding an Army mechanized unit, you should recognize that you have very good mobility and a very good mid to long range anti-armor capability, but that you may be weak in infantry staying power. In this case, OPFOR's best strategy may be to utilize multiple simultaneous avenues of approach either hoping to find a gap, or intending for one axis to be the main effort while the others pin or mislead you.

Analyze the strengths and weaknesses of specific weapons. especially those on vehicles that frequently face each other. For example, the U.S. Bradley has a TOW Anti-Tank Guided Missile (ATGM) that can kill armor out to 3750 meters. The OPFOR BMP has the AT5 ATGM which is slower than the TOW, but it hits at 4000 meters and beyond. If the BMP can engage the Bradley at ranges greater than 3750 meters, it can kill the Bradley without risk of return fire. On the other hand, if the BMP engages the Bradley from 3000 to 3750 meters, the Bradley may have time to spot the BMP and fire the faster TOW, killing the BMP before its missile reaches the Bradley.

Look for team solutions to tactical problems. For example, the enhanced ammo of the OPFOR T-80 tank can not penetrate the front of an M- 1 tank at more than 3000 meters. BMPs cannot kill the M1 tank from the front or side except with very slow to reload enhanced ATGMs. If the Bradley is teamed with the M1, the Bradley can kill the T-80 tanks before they close to within 3000 meters. The Bradleys can then pull back a bit and they and the M1 tanks can wreak havoc on the BMPs. Look for the peculiarities and advantages.

Gain and maintain contact and prevent battlefield isolation. The attacker has the initiative and will often attempt to isolate the battlefield by maneuver by concentrating his main force against

only one sector of the defense. The focal point of the attack becomes isolated from reinforcement when more distant defensive units are unable to maneuver towards the point of decision either through faulty intelligence (fog of war) or by being pinned by minor enemy supporting attacks.

Early and constant observation of the enemy forces are the keys to avoiding isolation. The defender must be able to observe the attacking forces early enough to both attrit them at long range and to assess their intended focal point, so that the defense may be reinforced at that point. To do this, the defender must not confine himself to the initial deployment limitations of the setup. Scouts and observation posts (OPs) should be pushed forward to cover all mission significant enemy avenues of approach. OPs should be redundant and they should be positioned to provide overlapping coverage of critical areas so that the loss of one OP to enemy action or its being masked by smoke or terrain does not create a large blind spot. OPs should generally not fire and reveal their position unless they are about to be overrun. Some defensive OPs should allow themselves to be bypassed so that they may continue to provide intelligence and to control long range artillery fires from behind the attackers.

Once the attacking forces are discovered. they usually should be engaged immediately. Generally, it its best to first engage distant attackers with artillery and air support rather than direct fire to avoid prematurely revealing the trace of the positions of your short to medium range weapons. This is especially true if the attacker is deployed with much of his strength forward. Artillery can destroy any thing on the battlefield, particularly with ICM, but, artillery must have forward observers for maximum effect. The proper use of forward observers and artillery will go far in disrupting an enemy attack.

If the enemy is leading with a small reconnaissance force, it may be more appropriate to engage the scouts with a few high accuracy, long range direct fire weapons so that you can immediately blind him and prevent the reconnaissance elements from exposing your main positions. Try to take out small advance forces with only a few concentrated volleys and then move any of your units that have fired to nearby alternate positions to await the main body. This is best done with forward deployed units, skirmishers if you will, that briefly engage the lead enemy units and then retire using terrain and smoke to cover their withdrawal. This screening force must avoid becoming decisively engaged by the main enemy force.

The defender also has a means to isolate portions of the battlefield. The key to the concept is to concentrate units and to position them in a manner that allows them to momentarily engage a smaller piece of the enemy force. For example, as OPFOR units advance to contact, they will often be strung out in a column of variable density and length. The defender can place himself at an angle to or on the flank of this advance, using elevation differences, towns, and or woods to initially screen himself from direct observation by the attacking units. As enemy units begin to pass through the screening terrain, the leading elements will become exposed. Since trailing enemy units will not yet be able to see the defenders, the defenders will be able to destroy the more forward attackers piecemeal without being subjected to return fire by the entire enemy force. If enemy reaction is sluggish and he continues to feed his troops into the kill zone after the initial ambush, this tactic can be continued from the same or nearby alternate firing positions. If the enemy reacts well and begins to deploy against your flanks, then immediately move to

positions that will provide a similar terrain advantage against his flanking maneuver. <u>This technique is known as terrain</u> <u>masking by angle.</u>
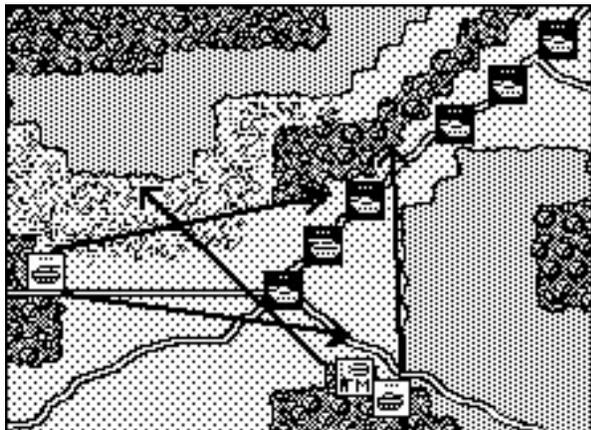
Proper use of terrain masking in an anti-armor ambush.

The same tactic can be based on terrain masking by elevation. In this case, the opposing forces are on significantly different ground elevations. The opponents cannot see each other until the leading attacking units crest a hill. The defending force can then engage and destroy just the leading units, again without being exposed to return fire from the entire enemy force. There are variations, such as using smoke to separate the leading attacking units from following units. but the concept remains the same.
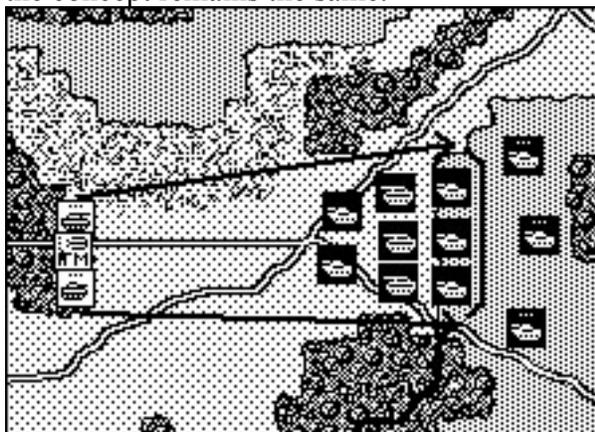
Proper use of elevation masking in an anti-armor ambush.

<u>Whenever possible the defense should be conducted as a</u> <u>mobile defense</u> that withdraws through a series of temporary fighting positions to a final point of decision. Until the attacker is heavily attrited, the defender should avoid decisive engagement. The initial formula should generally be: observe, engage with artillery, engage briefly with long-range direct fire weapons and withdraw those weapons, engage briefly with medium-range weapons and withdraw those weapons. Repeat this until either the enemy has been reduced to a manageable size or there is nowhere left to withdraw to - this is the point of decision. Assuming surprise fire is still possible, the defender's first goal at this last position is to kill as many targets as possible in the first few volleys of direct fire. After that the only choice remaining is usually to maintain fire, maintain position, and ride out the attack.

TacOps Offensive Strategy

By Don Hill and Major Holdridge
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Once you understand the mission, the next step is to analyze friendly and enemy forces and their capabilities. If you are commanding OPFOR and your force is composed of T80s and BTRs, the T80s will be about the only effective weapon you have for engaging enemy vehicles at long range. In this case, you cannot afford to pause and slug it out with a mechanized defender. You must rely on speed, artillery support, and the mass of numbers to close with and overwhelm the enemy. If your force is composed of T80s and BMPs, you will be able to engage in a more deliberate attack, perhaps even a multistage approach, since your BMPs can engage enemy APCs and IFVs at long range, and can even kill the M1 tank if enhanced ATGMs are being used.

As the Blue commander, you should note that the M1 can kill anything on the battlefield from any aspect at great range, and that it has superior armor to the OPFOR tanks. Without improved ATGMs, only the T80 can kill the M1 from the front or sides. This usually makes the M1 the best choice to lead any advance. If your force consists of M1s and Bradley IFVs, the Bradleys should usually trail the M1s by 500 to 1000 meters. If your force consists of LAVs and M1s, the M1s should usually still lead, but you will have to approach the enemy more carefully, taking maximum advantage of terrain masking. Only the M 1 s and a few LAV TOW vehicles will be able to kill T80 tanks. Just about anything can kill an ordinary LAV25. The same applies to a force of AAV7s and M1s, but you must be even more careful in your attack. The AAV7s simply carry too many Infantrymen to be rashly exposed to enemy fire. If there is enough time, dismount the Javelins in the AAV7s to overwatch the advance, but never lead with these huge APCs.

When analyzing the enemy force you must consider his ability to maneuver and his fire capabilities. If the enemy force consists almost entirely of unmechanized infantry, then, he will not be able to reinforce the point of attack rapidly. In this case, you may want to focus your attack as a rapid assault on one small area of the battlefield. Attacking unmechanized infantry on a wide frontage will usually only work to your disadvantage as it exposes you to a greater number of short-range infantry weapons.

If the defender is mobile, attack at multiple points, but focus on one as the main effort and threaten the others with supporting or diversionary efforts. Supporting attacks will tend to keep the defender from being able to shift his troop line and from being able to concentrate artillery and air support at the point of decision. Be alert to exploit unexpected success on the part of a supporting attack. A supporting attack may find a gap in the defense or the enemy may recognize the main effort early on and choose to ignore the supporting attacks. In such a case, it is possible that a supporting attack will encounter so little opposition that it should immediately assume the role of the main effort.

Analysis of the enemy fire capability is important for choosing target selection. If the enemy forces consist of BTRs or BMPs without improved ATGMs, then, only the T80 will be able to kill the M1. In this case, the T80 should be Blue's priority target. Once all are eliminated, the M1

will be able to dominate the long and mid-range battlefield. When fighting Marine forces, TOWs and M1s should be the priority targets due to their maneuverability, and long-range lethality. All exposed infantry and ATGM teams are highly susceptible to casualties and suppression from artillery fire. Just a suppression result will greatly reduce infantry's movement speed, rate of fire, and accuracy. ATGM teams should always be a special priority for artillery.

<u>When analyzing the terrain for offensive operations you should first consider the time available to accomplish your mission. Next, identify all reasonable attack routes or avenues of approach that will meet your mission time limit</u>. Mentally identify likely enemy unit defensive positions along each route and select the route that offers the best potential for coping with them. The obvious advantage of a high speed avenue of approach, such as a road or open terrain, is that it takes the attacker less time to close with the defender and thus the defender has less time to adjust artillery and to engage in direct fire. Fewer shots by the defender translates directly into fewer kills. Being able to speed through incoming artillery is especially advantageous to the attacker.

The primary considerations in deciding whether to attack using a high speed avenue of approach is the expected density of enemy long-range weapons defending that route and how much of the route they command. High defender density combined with long-range line of sight usually means disaster for a high speed attack. In such a case, you should look for a more covered route. take the time for an extended artillery bombardment, and, in general, make a more deliberate attack. However, if you have very little time allowed for your mission, you must use the most direct attack route. regardless of consequences. In such a case, using your supporting artillery for widely roving general suppression may prove more beneficial than concentrating it for killing effect.

Using a low speed avenue of approach through rough terrain, woods, or a town also has its advantages. They generally offer long-range concealment from enemy observation and some of your units may avoid detection altogether. Even if you are spotted, such terrain often reduces the enemy's direct fire hit probability significantly. It is also likely that these approaches are less heavily defended than the high speed avenues. The disadvantages are that once attackers are spotted in rough terrain, their slower movement makes them easier to hit with artillery and allows the defender more time for direct fire. Also, the slower rate of advance will give the defender more time to shift reinforcements to directly face or flank your attack.

Both the attacker and defender struggle to control the pace and events of the battlefield. One way to achieve control is to isolate a portion of battlefield so that only a portion of the enemy's forces are able to participate in an engagement, thus enabling you to overwhelm them with firepower. One way the attacker can isolate the battlefield is by maneuver. If the defending force consists mostly of unmechanized Infantry, the attacker can use either surprise or superior mobility to focus his forces at one point faster than the enemy can reinforce.

Another way the attacker can isolate the battlefield is by using the terrain to restrict observation and exposure to direct fire. Attacking formations can take advantage of terrain elevation masking to advance in tighter formations while out of the line of sight of known enemy positions with a pause just before an elevation change to deploy into a more on line attack formation. Terrain

masking by elevation can work to the defender's advantage by suddenly exposing the attacking forces piecemeal to defending units at a different elevation. The attacker can reduce the effects of this by crossing elevation changes with his units more on line. When the attacker crosses elevation changes in this manner he is more likely to achieve fire superiority in an isolated enemy kill zone and to avoid piecemeal attrition.
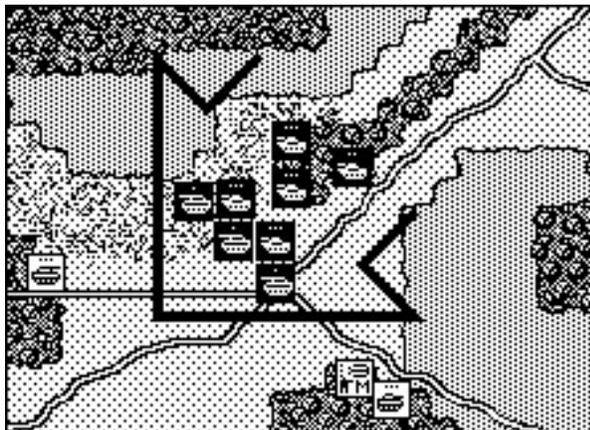
Proper way to attack through masking terrain.   **Proper way to attack across an elevation change.**
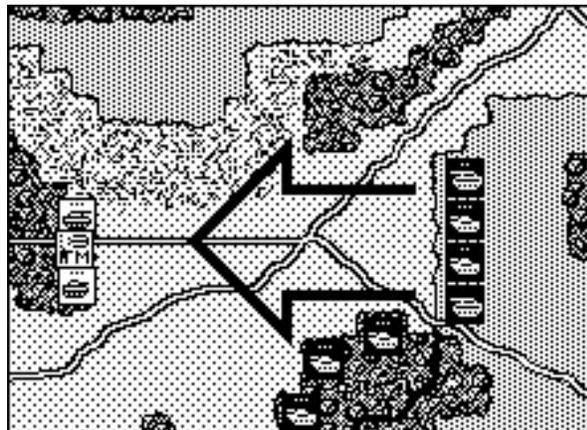
As extended formations pass around woods or hills, leading elements may become exposed to fire while trailing units are still out of sight. For a moment, trailing units cannot support the leaders since their line of sight is still blocked by the nearby terrain feature. This is terrain masking by angle.

The attacker can take similar advantage from terrain masking by angle. Crossing such terrain in mass or on line is just as helpful in reducing the effectiveness of masking by angle as it is against masking by elevation. If the attacker has enough time he can reduce the threat of terrain masking by moving through or over terrain that blocks line of sight in mass or on line. If the terrain feature is woods or town, the leading units should pause at the edge of the terrain feature and provide overwatch as trailing units move up to and perhaps pass through their position. Not only will the attacker have more forces to return fire, the units providing overwatch will be stationary and in cover thus in creasing their chances to spot and hit and giving them added protection from fire

TacOps Tactics - The Basics

By Major Holdridge

Q: If I dismount my infantry from their APCs when the APCs are beyond RPG range the infantry takes forever to reach whatever they are assaulting and subsequently get mowed down. This is especially true if they are assaulting an entrenchment. How should I effectively use infantry to assault an objective (Other than trying to come at them from the non-front direction).

A: The feeling that walking infantry "takes forever" can be misleading - a turn in TacOps is only one scale minute. If the threat to your infantry is heavy weapons like tanks and APCs then you need to support the foot assault with tanks and APCs of your own to take them out. Support your foot assault with serious and continuous arty and mortar fire on the enemy infantry. This will at least suppress the enemy infantry (they fire less and or they hit with less effect). Use arty and mortar smoke on the assault objective and on any more distant enemy positions that can see it - what the enemy infantry can't see they can not fire at. An example combined arms attack might go something like this: shell the enemy position with arty HE and or ICM until you build up good accuracy then drop one smoke volley on it then continue shelling with HE or ICM. One volley of arty smoke can be expected to last for about eight minutes (some mortar smoke clears faster). During that eight minutes you move your infantry forward in APCs, stop the APCs and unload the infantry a couple of hundred meters out from the objective and start them walking - the APCs and tanks stay put to provide supporting fire. If you time things properly, the smoke will clear just about the time your infantry closes with the enemy.

Q: When an APC gets hit and dumps its infantry, what should I do with them, if anything?

A: Load them onto something else nearby - preferably another APC but a tank can also carry them. Or just start them walking in a useful direction - in longer scenarios they might just come in handy an hour later when they actually get where they are headed. Or send them to the edge of a nearby piece of high ground and park them, set their engagement range to zero and just use them for observation posts.

Q: If I'm pounding an enemy-occupied entrenchment with artillery to keep them suppressed while I assault it, at what point should I cease fire to avoid fratricide (meaning how close is too close)?

A: The size of the explosion animation is a fair guide to the radius of effect. I think the effective radius is always a bit smaller than the animation.

Q: What are the various strategies for determining at what range to fire? Should I wait to see whites of there eyes or blaze away at maximum distance but minimum accuracy?

A: The choice of engagement range is too dependent on the terrain and tactical situation at the instant to be able to answer this very well with simple rules.

You can develop quite a few insights from prowling through the game and the materials that came with it. Carefully read the designer's notes and appendices at the end of the manual.

Load up a game scenario and select the Unit Data Base menu item in the Reports menu. This will take you into the "on-line" unit and weapon data base. Click on the units from the list and examine the technical information provided on each type of unit in the game. For each unit, look at its armor protection, look at its photo, and look over the list of weapons that it carries. Use the window buttons to look up the technical info, armor penetration table, and basic hit probability table for each weapon. Compare the Blue and OPFOR data for the most common and most important units. Note which Blue units can kill OPFOR main battle tanks and at what ranges and from what aspects; which Blue units can kill OPFOR BMPs and BTRs.

Your training will progress faster and with less frustration if you begin with scenarios that have Blue on the defense and that use US Army units. Don't command Marine Corps units at first. Marine units are generally low on vehicle mounted, long range, direct fire weapons and thus require greater experience and finesse to use successfully. Defensive tactics are a lot easier to learn through experimentation than offensive tactics. Start with the simple tactic of shelling the advancing OPFOR with arty followed by direct fire ambush and falling back ... shell, ambush, and fall back.

Some general tactical suggestions ...

Study the scenario mission. What must you do to accomplish your mission? What must the enemy do? Study the battlefield. Look at the terrain from the point of view of your enemy. Where must he be or where must he move in order to defeat you?

Recon and long range observation is critical since TacOps replicates fog of war. Gain contact with the enemy as soon as possible and maintain it. Contact can mean merely observing the enemy. It does not necessarily always mean getting into a firefight. Strive to know where the enemy is and to know where the enemy is not. Unless it is in your best interest to be in a hot firefight, try to keep the enemy from maintaining contact. Kill his recon units, kill or blind his observation posts.

Don't shoot direct fire if artillery can do the job.

Maintain a reserve behind the most forward units even if all you can spare is a tiny force only fit for controlling artillery.

Unless you have good reason to do otherwise don't bunch your units up. Don't travel in company size markers if there is any chance that the enemy may be observing you. Travel in platoons when contact is likely. Keep several hundred meters between platoons so that an ambush or a lucky arty or air strike doesn't do catastrophic damage.

If you start receiving artillery and you are defending. move immediately to an alternate firing position. Start your move before the arty gets accurate. If you are advancing, disperse and don't move more than a few hundred meters in a predictable straight line. Try to figure out where the

enemy artillery observers might be and try to move out of their line of sight or try to kill them with arty.

<u>If possible. avoid fighting front to front.</u> Set up direct fire kill zones that have your units firing more into the weaker side of enemy forces than into their front.

<u>Don't try for a big bite when a nibble will do</u>. Set up pockets and kill zones that let you quickly annihilate manageable portions of the enemy force without exposing your guys to overwhelming return fire. When you do manage to wipe out a piece of the enemy don't pause in place for a celebration. Move immediately to an alternate position even if the move is only a short distance.

<u>Work hard to develop a battle plan</u> that will accomplish your scenario mission without getting all of your guys killed. This may sound obvious, but it is a concept often overlooked by wargamers.

A hint to help you sort out what is happening in the combat phase ... <u>Each class of weapon in the game has a</u> <u>distinctive. realistic sound.</u> Learn the sounds and listen to the battle as well as look at it.

TacOps Tactical Tips

By David Hoeft

Here's a few tactical observations and suggestions, based on things I've learned through playing these last few weeks.

Spotting is critical. You have to know where OPFOR is coming from and going to, so you can use your artillery effectively, and shift reserves appropriately. It's even more important when you've set the preferences to 'realistic spotting'. I try to get some units well out in front of my main line of resistance (Humvees or APCs, if possible with a small rifle unit along), park them in some woods in 'cover' mode with a good field of view towards where OPFOR is coming from, turn their weapons range to zero, and then let them sit, providing observation. Infantry is best for this, as it can't be seen until very close up, but often a single vehicle is adequate.

I also try to have a few similar 'spotters' scattered back through my whole defense so as to keep things in sight in case the major units get overrun. Finally, if you can spare them, leave one or two such spotters hidden deep in some woods, to be bypassed, but then to come out later and provide 'rear area' observation (great for calling in artillery on units moving up to the front by road).

Place units on the reverse side of obstacles; this lets them get the OPFOR units from side or rear as they pass, lets you set up crossfire zones more easily, and usually prevents the OPFOR artillery from chewing them up before any OPFOR units get into range. Certainly, the forward side of the forests is tempting and looks like a good place to set up, but the problem is that the AI knows it's a good place, too, so has a tendency to pound the sites early on.
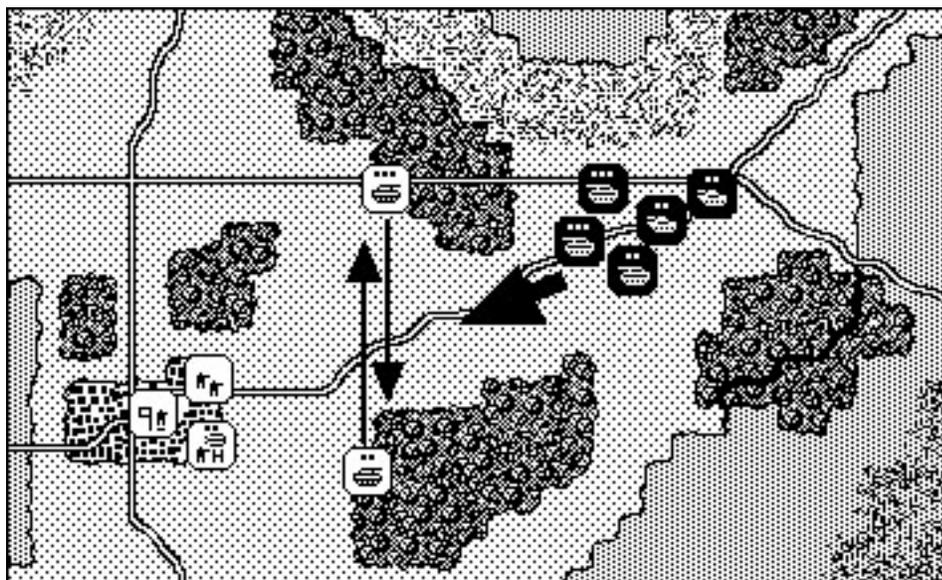
**Place units on the reverse side of obstacles; this lets them get the
OPFOR units from the side or rear as they pass.**

Support your ATGM units with some solid infantry. Something that really works well for me is to have one or more ATGM units stacked with or near a heavy MG team on the reverse side of a woods overlooking a road. As the ATGMs get the OPFOR APCs, the MG team will eliminate the infantry units dumped by the destroyed vehicles. This will also help in case the OPFOR units come at the Javelin team through the woods; in close quarters combat your infantry units can do a lot of damage to enemy APCs. In general, while the infantry can't do much if it's out in open terrain, distant from the OPFOR units, it can be tremendously effective if it's entrenched, fighting up close, and in platoon or company strength.

Try to keep units shifting around. Once you're spotted you will be pounded and eventually destroyed, and in the scenarios where OPFOR has a big advantage in numbers and you're on the defensive, you can be ground down if you play the attrition game.

If possible, have units back up a little way after firing, then return to a different spot to fire from, then move again. This is especially important with the armored units; don't waste those big, mobile guys by planting them where the OPFOR artillery or ATGMs can wear them away.

Defend in depth. When you plan your defense, anticipate and set up so that your units have 'fall back' defensive sites to move to. Don't have everyone up front on the line; make your initial set-up deep, and definitely keep a mobile reserve force.

I try to keep a good share of the tanks, and a few APCs with some Javelin teams and SMAW teams well back behind the lines, able to shift north or south, to reinforce places OPFOR seems to be pushing hard or to cut off units which have managed to break through the main line. Keep these reserves well back and out of sight. and have a plan for where you'll want to place them, in good cover, etc. if the need arises.

As the OPFOR attack progresses, and you get an idea of the major axis of their advance, take time to get some artillery TRPs with accuracy levels of '5' registered somewhere well out in front of the OPFOR forces, especially in places they'll funnel through. This will enable you to lay down fires quickly on them as they advance. It's worth it to do this, even if you have to lessen your suppression fires elsewhere for a turn or two.

'Pre-order' some of your air support; that is, order one of the missions that are 15 minutes out from the battlefield and target it somewhere near the center of the anticipated action, even if none of the OPFOR forces are there yet. This way, you'll (hopefully) have timely air support, still be able to save your 'rapid response' air assets for some other threatened area, and will make good use of those '15 minutes on alert' guys, who otherwise may be too slow and too late to help in a rapidly evolving crisis.

TacOps Tactical Tips - Continued

By Ned Anderson

Here are some tactics I picked up from Army FM 71-1, November, 1988: "Tank and Mechanized Infantry Company Team".

1) <u>Improved TOW Vehicles.</u> ITVs are best used if employed in defensive operations only. They are too slow and too weak to support M-1s, M-2s and M-60A3s in offensive ops. They can engage targets further out than most every other weapon used by the ground forces. They should target ADA vehicles first, allowing a better chance for attacking aircraft to survive their run.

2) <u>Improved TOW Vehicle deployment</u>. When given an ITV unit, split it into individual vehicles and place them in mutually supportive positions at least 300m from each other along likely enemy routes of advance. Allow two or three vehicles a clear LOS to attack the flanks of enemy units, place the other units in frontal engagement positions.

3) <u>ADA deployment.</u> Split any attached mobile ADA units into single units, assigning four per company of IFVs or tanks (one per platoon and one for the HQ section).

4) <u>Defensive Operations.</u> In defensive operations, place one platoon from each company about a kilometer ahead of the rest of its unit. This allows the player to have advance warning of the enemy approach and will allow him more time for executing his/her options. For example, four M1s ahead of the rest of the company, who are entrenched, locate an enemy armored company heading their way. The M1s fire one shot each, then retreat back to the battle positions of their company. The player then adjusts the positions of the rest of his/her company and attached assets (artillery, infantry, anti-tank) to better suit the circumstances.

TacOps Tactics - AH-64 Apache Attack Helicopter

By Kyle Mizokami

There's been a lot of talk about Apaches vs. small arms lately on how Apaches seem so vulnerable to infantry weapons. We've all had Apaches shot down by a seeming fluke.

What we have to keep in mind here is that the Apache is by far the most mobile and deadly weapon system the Blue player has: the Apache can fulfill a wide spectrum of roles: anti-tank, anti-personnel, air defense suppression, air defense, scouting, and forward observation. The Apache is that versatile, and yet it is also one of the most delicate weapon systems, exposed to the deadliest of threats. To get maximum use of our Apaches we've got to use their strengths to deny the enemy the chance to exploit its weaknesses.

Firepower and mobility are the Apache's two greatest strengths. The long range and destructive capability of its missiles enables the Apache to strike targets out of range of most of the OPFOR's weapons; if employed properly at a stand-off range, the Apache's only threats are ZSU-23-4s, SA16s, and the occasional pesky MiG27. The unparalleled mobility of the Apache allows us to deploy it along the enemy's axis of attack, maintain it far ahead of OPFOR columns and out of reach of his secondary AA weapons, and if necessary, reposition the Apache quickly to counter another threat axis. If mobility and fire power are used to their full extent we can keep destruction of the enemy to a maximum, anti-Apache threats to a minimum, and devise tactics to counter the remaining ones. If we get fixated on one of the two and neglect the other, at best our Apaches will have little impact on the ground battle, and at worst, our Apaches are gonna die.

Use the Apache's firepower to destroy the enemy at long range.

Use the Apache's mobility to keep ahead of his secondary AAA, so that you can concentrate on the main AA threat. Apaches have no business within the threat envelope of 30mm cannon, 12.7 machine guns, and RPK-74s. Maneuver them to keep out of range of these threats. If this is done, you don't have to worry about whether or not 7.62mm rifle rounds can kill Apaches.

Don't use your 30mm chain gun for anything but self-defense. Using them in the offensive role invites trouble. If you're in range to use the gun, he's in range to use his, and he has more guns than you. Get away! Once you are out of Hellfires, the alternative to going hunting with the gun is to provide air defense for your ground force (if you have any Stingers left), and forward observation for your artillery. In a pinch Apaches could use their guns to stop a ground attack, but if you're that desperate, you're not gonna stop the attack.

TacOps Tactics - Artillery

By Robert D. Clark, CPT, FA, USAR

Below are some thoughts and hints on the fire support system in TacOps.

First off, remember that artillery is an AREA-effect weapon, not a precision destroyer of tanks (with the exception of Copperhead rounds, which are large, heavy, and always in chronically short supply anyway). The best use for your artillery is to engage with it at long range, as far out as you can see. Keep arty adjusted along likely avenues of advance (and remember to save these points as TRPs). When you see OPFOR units come into sight (hopefully in column), switch to ICM for armor, HE for infantry, and start pounding. To get good effects fire several salvoes into the enemy, and remember to LEAD vehicles, targeting where you *think* they'll be in x seconds (however long till the next TOT) since suppression does not fix their position, the way it does with infantry (those are fun, get 'em suppressed, and then pound the hell out of 'em). Also remember that the fire support function is a combat multiplier, and that its function is to attrit the enemy, not wipe him out completely. That's what we pay the grunts and tankers to do.

Second, I've seen a lot of complaints about weapons loadouts for the air strikes (CAS for those in the know). As far as I'm concerned, the routine works just fine. Who cares if it's nape (napalm), cluster bombs, snake-eye, or just old plain-vanilla slick bombs. Not the ground force commander. He just wants a big boom out there on the bad guys. TacOps does this just fine. I mean jeez, what do you want anyway...there's no routine for "use it or lose it" for your CAS the way it is in reality (where A/C loiter times and the needs of other commander's can take your flight of F16's away from you at the last minute). You're already getting more CAS in the game than I believe you'd see as a brigade commander let alone a battalion commander.

Use your on board artillery well. and remember the one third/two thirds rule. In the attack, have one third of your range behind the FLOT (Forward Line Of Troops), two thirds in front of the FLOT. In the defense, reverse the equation. Mortars aren't much good against vehicles, so use mortars for smoking (nothing like a good smoke screen for doing unto others with impunity). If you've identified SAM and ZSU positions, and you have an airstrike on the way in fire a SEAD (pronounced, "see-add", for Suppression of Enemy Air Defense) mission on those sites, the minute before, and during the strike).

These simple rules (pounded into my thick head at FA Officer Basic Course at Ft. Sill) can help you to get the most out of your fire support.

TacOps Tactics - Retreats

By Major Holdridge

Q: Is there any good rule of thumb for falling back under fire? ... when I try to move units back after they've come into contact with the enemy, they get destroyed.

A: Use terrain to isolate line of sight into your firing positions from as much of the enemy force as possible. Pick firing positions and kill zones that channel your fire through "terrain tunnels" that let a lot of your units fire on (and get return fire from) only a few enemy units at a time.

Defend from cover so that when you choose to retreat you almost immediately break line of sight. Use unit SOP settings so that units reverse after their first volley - if you are awarded "surprise fire" with your first volley you will get at least one "free" 15 second pulse with no chance of return fire and by the next pulse you may be out of sight as you back deeper into cover.

Defend sometimes with your long range shooters positioned right on the edge of high ground, so that you can fire and then immediately reverse out of sight.

Maybe you are retreating with your rear toward the enemy. When retreating under fire, keep the front armor of vehicles toward the enemy - hold down the Alt key as you click on the map to order a unit to move in "reverse".

TacOps Tactics - Platoon/Company Operations

By Kyle Mizokami

Keep your platoons close together, so that one platoon can always support another if it gets into trouble. Don't put your platoons out on a limb. A good rule of thumb is to put the map grids on the map, and keep your company more or less within a 1000 meter box/grid sized area.

At least as far as the Army goes, three platoons per company is not flexible enough; it just doesn't offer the flexibility four platoons offers does. Battalions have four maneuver companies; companies ought to have four platoons. Four tanks per platoon is ideal, three is too little, five might be too much.

In team level games. tank platoons should be broken up into two tank sections. You have few enough tanks as it is, and this will reduce the chance that all of them could be killed in a single engagement, especially by airstrikes. Bradley platoons should be kept intact to concentrate TOW missiles and dismounted infantry strength.

In defense, Bradley platoons should have their dismounts (infantry and missile teams) keep their distance from the Bradley itself, oh, perhaps 90-100 meters. This is because the Bradleys will give their position away eventually from firing their TOWs, usually at long range, and the enemy may respond with artillery. "90-100" meters will give the dismounts enough distance to be mostly unaffected by artillery fire directed at the Bradleys, but they won't have to do any extra movement to mount back up into the Bradleys quickly when it's time to move—loading with be instantaneous.

When moving in a convoy down a road, detach a single vehicle from the lead platoon and designate it the point vehicle, keeping it about 750m ahead of the rest of the platoon. With this distance, if the point vehicle is destroyed you ought to be able to halt the rest of the column before it too comes under fire. The company itself should space about 250 meters between traveling platoons, just in case. This works out to about 1.25km for a company in road march.

A company can effectively physically hold about a kilometer of front. defend about three kilometers (kill anything within 1500 meters ahead and to the flanks), and influence about 5 kilometers (send out OPs and hit the enemy with artillery before the rest of the company can engage).

TacOps Reading List

By Major Holdridge and Kyle Mizokami

Q: Can you recommend some good references for TacOps that I might be able to find at my local bookstore?

A: I don't know of anything on OPFOR that might be locally available. The best reference on OPFOR (OK, OK the Former Soviet Union) is "Weapons and Tactics of the Soviet Army" by David C. Isby. Every modern wargamer should have this book. It is thick and has lots of photos. I can not recommend it enough. It can not often be found on the shelf of a popular bookstore, but I am sure they could order it for you. Also worth ordering are "Soviet Airland Battle Tactics" by William Baxter, and "Red Thrust" by Steven Zaloga.

For US weapons and tactics, good titles that you might find locally would be "Iron Soldiers" (paperback) by Tom Carhart - a real fun read, "Crusade" by Rick Atkinson, "Armor Attacks" and "Infantry Combat" (large format paperbacks) by John Antal, "Tank Attack: A Primer of Modern Tank Warfare" (large format paper back) by Steven Zaloga, "Desert Storm Ground War" (large format paper back) by Hans Halberstadt, and "From Shield to Storm" by James Dunnigan.

You might also call the Marine Corps Association at 800 336-0291 and order their book called "Mastering Tactics" by Major John F. Schmitt, USMCR. $11.95 for Association members and $14.95 for non-members. This is a 8 1/2" x 11" work book that breaks down 15 of the Tactical Decision Games that appear every month in the Marine Corps Gazette. The scenarios cover everything from squad to battalion level engagements with detailed maps and the book includes an excellent Table of Organization for the USMC.

As a general rule, anytime you see a book by David Isby or Steven Zaloga - buy it. They give good scoop, and they don't puff up their work with casual speculation.

These are fiction paperbacks but for modern weapons and tactics info they are better than a lot of nonfiction works: "Team Yankee", "Sword Point", and "Bright Star" all by Harold Coyle, and "Red Storm Rising" by Tom Clancy.

Other References:

Nonfiction: World War II
  Infantry Attacks, Erwin Rommel
  Panzer Battles, Gen. F.W. von Mellenthin
  War as I Knew It, Gen. George S. Patton
  A History of the Blitzkreig, Bryan Perrett
  The Heights of Courage: A Tank Leader's War on the Golan, Avigdor Kahalani

Nonfiction: Persian Gulf War
  Certain Victory: The U.S. Army In the Gulf War, BG Robert H. Scales, Jr.
  Iron Soldiers, Tom Cathart

Crusade, Rick Atkinson
The Desert Shield Fact Book, Frank Chadwick
Triumph Without Victory: The Unreported History of the Persian Gulf War, staff of US News and World Report

Nonfiction: OPFOR Weapons and Tactics
Soviet Airland Battle Tactics, William Baxter
Weapons and Tactics of the Soviet Army, David Isby
Inside the Soviet Military, Cary Schofield
Inside the Soviet Army, The Liberators, Victor Suvorov
Red Thrust, Steven Zaloga

Nonfiction: Weapons and Technical, also General Interest
Armored Cav, Tom Clancy
Armies of NATO's Central Front, David Isby and Charles Kamps
Strike Force: USMC Special Operations, Agostino von Hassell
Airborne: Assault From the Sky, Hans Halberstadt
Mud Soldiers: Life Inside the New American Army, George Wilson
Weapons Systems, US Army 1992, Government Printing Office

Nonfiction: Osprey Books
Inside the US Army Today, Gordon Rottman and Ron Volstad
Inside the Soviet Army Today, Steven J. Zaloga and Ron Volstad
Desert Storm Special #1: Land Power, The Coalition and Iraqi Armies, Tim Ripley
Panama 1989-90, Gordon Rottman and Ron Volstad
Warsaw Pact Ground Forces, Gordon Rottman and Ron Volstad

Nonfiction: Strategy, Operational Art, and Grand Tactics.
Forward Into Battle: Fighting Tactics From Waterloo to the Near Future, Paddy Griffith
Strategy, B.H. Liddell Hart
Maneuver Warfare Anthology, James D. Hooker, ed.
The Art of Maneuver, Robert Leonhard
Maneuver Warfare Handbook, William S. Lind and Michael Wyly
The Art of War, Sun Tzu (any translation)

Fiction:
Red Storm Rising, Tom Clancy
Team Yankee, Bright Star, Trial By Fire, The Ten Thousand, Harold Coyle
Arc Light, Eric Harry
Fire Arrow, Franlin Allen Leib
Red Army, The War in 2020, Ralph Peters.
The Defense of Hill 781, James McDonough

Periodicals:
Armed Forces Journal International
Aviation Week and Space Technology

Command
Counterattack
Defense News
For Your Eyes Only
International Defense Review
Intelligence Newsletter
Military Digest
Military Review
National Defense
Soldier of Fortune
Strategy and Tactics

Appendix C - Frequently Asked Questions

The following items provide insights into the TacOps design and the play of the game. They are presented pretty much the way I received them during playtesting, warts and all. Lest you think I always argue with playtesters, it should be mentioned that I have not included the hundred or so notes covering suggestions that I agreed with and then acted on with immediate and significant changes to the program.

Antitank Guided Missiles (ATGMs)

Q: Is guided ATGM fire affected by suppressive fire and the 10 to 30 seconds of flight time, or is the ATGM treated as a fire and forget round?

A: The speed of ATGMs is in the data base and is calculated for every ATGM fire. You will occasionally see one of the slower ATGMs take two, fifteen second combat pulses to reach a target at three or four thousand meters. Guided ATGM fire can be affected by suppressive fire if the missile takes longer than about ten seconds to get to the target. Only the Javelin ATGM is currently treated as a fire and forget round.

Artillery

Q: Why does the game allow artillery salvos to be shifted to a new target when they are only a few seconds away from impacting?

A: The current TacOps artillery abstraction is not intended to replicate the detailed, real world procedures involved in getting artillery rounds on target. The artillery routines are heavily abstracted to be "effect oriented" rather than "procedure oriented". They are meant to replicate plausible effect on target - not call for fire procedures that would in effect become a game in themselves and that would bore anyone but an artillery officer to tears. Ultra realistic fire support procedures would require a lot of tedious work from the player. Most players would find the additional detail boring and the extra work annoying. They are very much like real world commanders in this - they want effect on target but they don't want to be bothered with the details of how it gets there.

I know that artillery rounds usually travel through the air for many dozens of seconds. I know that one can not magically change a round in flight, from HE to ICM. I know that artillery salvos can not be instantly shifted 1000 meters while in flight. These details are irrelevant to the artillery abstraction presently used in TacOps.

In the real world there are a lot of people working very hard in the background to get artillery on target and they usually succeed. Real world artillery fire for effect doesn't usually arrive every thirty seconds in a three boom animation. Unless the batteries are only firing one round per tube for the fire for effect, the beaten zone is going to be active with more or less continuous explosions for several minutes. If the target is moving then at some point in the fire mission the real world spotters and batteries are going to change firing data to keep pace with the target. As long as the TacOps combat results are plausible over the span of several minutes of fire then it

doesn't matter that TacOps abstracts the continuos nature of real world artillery fire into discrete pulses of destructive effect and it doesn't matter if rounds can be magically shifted in mid air.

What I want TacOps to convey is that modern artillery is flexible, is timely, and is very destructive. TacOps artillery fire missions are meant to be an easy to use quantifier of the levels of destruction that are reasonably achievable by artillery support over several turns. It is not relevant to the current abstraction for technical procedures and physics realities to be calculated every single time a screen animation seems to indicate that a salvo is landing.

Q: Why does unobserved artillery wander around the target so much?

A: In real life, modern artillery does not deviate significantly between salvos unless the gunners change their firing data. This happens in TacOps as a gaming abstraction intended to simplify the artillery part of the game. The wandering impacts are intended to represent the real world tactic of "walking" salvos around in an unobserved target area in hopes that one of them will be productive.

Q: Off map artillery should be susceptible to counter-battery. Players should be able to divert their artillery support to counter-battery work.

A: Counterbattery is not in the game. The amount of artillery available to Blue and OPFOR units in most scenarios is far below the real world best that either side could muster if either had local arty or air superiority. The game scenarios usually replicate battle in an area where the situation is more or less equal - both sides may even be a bit short of support. The air and artillery that gets through to the TacOps battlefield is conceptually what is left over after everything off map that could be suppressed, has been. At a tactical level, there is no reason to game a scenario in which one side has overwhelming air or arty superiority - the winner would not be in question, there would be no "game" to it.

Q: There's too much arty ammo. I don't know if the ammo represents minutes of fire or rounds of fire (which seems to average two per minute), but either way, there seems to be too much.

A: Ammo for off map artillery is not stated in rounds - it is stated as salvos (a TacOps salvo is a fuzzy minute of fire from some indistinct number of tubes - somewhere between a hardworking battery and a lazy battalion). Most people complain that there is not enough artillery ammo in the scenarios. Either way, the program allows players with strong sentiments in this area to adjust the amount of ammo available to both sides at the beginning of any new game - up or down.

Q: I am convinced that the Blue response time to call for fires is faster than one minute. I know that in Kuwait they executed a counter battery fire in less than 20 seconds.

A: Can be 20 seconds, not counting time in the air, but usually is much more. TacOps arty response time conceptually includes time for calling for the mission, mission approval, processing firing data, and flight time of the rounds in the air. To avoid a thousand lines of code for arty and several layers of artillery support windows for the user, this is handled with a generalized response time for each side and for each type of arty weapon. The exact time for

each mission is made slightly variable by a random die roll to select an impact time from within a general response span. It is my opinion that TacOps artillery leans more toward being too responsive but in practice it seems to provide a reasonable compromise. Take a piece of paper and write 0600 (a time) on the first line. Then on each subsequent line enter a person or an activity and assign a time period to that line. Do this for all the people and steps involved between the time that a private in an infantry squad says "Gee, Sarge look at that" and the time that artillery rounds begin to impact on a target. Then come back and tell me that TacOps arty is too slow.

Q: Does the reverse slope reduce the effectiveness of the artillery?

A: Only from the perspective that a unit on a reverse slope is unlikely to be observed and unobserved arty fire is very inaccurate. The actual trajectory of incoming arty is not gamed - arty can reach every point on the map. There is not enough elevation differentiation in TacOps to be concerned about arty not being able to obtain a good fire solution.

Q: I don't understand how the changing accuracy of artillery fire is arrived at. I have had accuracy drop even though the target was in view of one or more units.

A: Artillery accuracy increases one level per volley if the center pixel of the arty target point is within the legal line of sight of any unsuppressed friendly unit at the instant of impact. Observation by specialized artillery direction units (such as Forward Observer, FIST, COP, etc.) increases accuracy by two levels per volley. If these conditions are not met, the accuracy decreases one level. The maximum possible accuracy level is 5. Decreasing the accuracy of unobserved artillery fire in steps is a playability and realism compromise. In the real world, modern artillery does not vary this way from its last impact point unless the firing battery changes its firing data.

Q: 60 mm and 81 mm mortar fire is not death incarnate, but they do an awful good job at suppressing infantry, sometimes to death. This is not reflected in the game.

A: Yes it is, but 60 mm and 81 mm fire has to be dead on the center of the target unit. Both have a very small salvo radius compared to 155 mm, especially if you have split them into one or two tube sections.

Q: After successive artillery fires on Infantry in the woods, I was unable to obtain a single suppression. This was also true of Infantry in the open.

A: Then you were not hitting them, any infantry unit within the salvo radius of an artillery mission is almost always automatically suppressed.

Q: I had five turns of 81 mm and 155 mm fire on Infantry in the open. Not one of them was killed.

A: The artillery fire may not have "eliminated" a whole unit, but you were most likely killing individuals within the units. If you click on spotted enemy infantry units you can see their

personnel strength in the info line at the bottom of the screen. Artillery casualties are applied incrementally against the personnel count of infantry units. An infantry unit marker does not go away until its personnel count reaches zero.

Q: What's the rule on smoke duration? I timed one mission and it only lasted 5 minutes. I'll have to check on sources, but my impression was that it lasted 15 minutes barring windy conditions.

A: Real world individual WP smoke rounds burn for 1 to 1 1/2 minutes - other rounds burn 3 to 4 minutes. Duration of artillery smoke after active burning stops depends on number of rounds fired, their distribution, plus environmental conditions such as humidity, temperature, and wind. However, the technical details of arty smoke are irrelevant to the ground commander who wants to use smoke. The ground commander does not calculate how the mission is to be fired - that is the job of the cannon cockers. The ground commander states what he wants to obscure and how long he wants the obscuration to last. It is the job of the artillery folks to figure out how to make it happen given environmental conditions in the target area. TacOps provides a simplified smoke mission that varies in size according to the size of the unit firing the smoke and varies somewhat in duration of effect to create uncertainty and variability without worrying about weather in detail. The dust/haze from a MRL or MLRS strike obscures for 30 to 70 seconds. Smoke grenades/dischargers obscure for 30 to 70 seconds. 4.2", 81 mm, and 120 mm mortar smoke obscure for 3 to 4 minutes per salvo. 122 mm, 152 mm, and 155 mm arty smoke obscure for 5 to 7 minutes per salvo. For additional variability and uncertainty there is a check made every fifteen seconds once the initial smoke timer expires - there is a 50% chance each check that any kind of smoke will obscure for another 15 seconds. The wise player will make notes about start times for his smoke. If long term obscuration is wanted, the player must periodically reseed the cloud with new fires.

Q: Pre-plotted artillery targets don't disappear even when "Plot Targets" is turned off until first combat phase.

A: The "setup turn" artillery TRPs or registration points are initially different from targeted arty missions. The program treats them like "unit markers" until the player commits himself by starting the first combat phase. Then they are converted, recorded, and are thereafter accessed using the arty support dialog just like other artillery TRPs.

Q: Why can't I place artillery delivered minefields and fire missions at the edge of the map.

A: I put a check in the program that sometimes prevents laying of mines and fire missions within 500 meters of the west or east map edges. This is partly a needed program constraint but mostly it is an arbitrary response to one of my early game opponents placing artillery delivered mines right up against the edge of the map in order to nail my units as soon as they came on the map - boring. It seems a bit less than sporting to not let the enemy at least get in the game.

Air Support

Q: At the player's option, air assets should be able to be committed operationally instead of tactically to interdict and attrit reinforcements.

A: Put this to music - tactical game, tactical game, tactical game. As with artillery, the air concept is that the interdiction and attrition effort has already been done by higher headquarters and either it wasn't working today or else this bunch just got through it. What is reaching the TacOps battlefield has already survived that sort of attention and is now in, or almost in, the nose to nose arena. The TacOps player is an amalgamation of all the Company and Battalion Commanders involved in a defined local action (and maybe one Regimental/Brigade Commander). The Division and Corps Commanders are playing a different game.

Q: Air strikes have generally been very useless. The plane arrives right on time and on target and then gets promptly shot down.

A: Having a SAM in every OPFOR infantry platoon certainly makes it tough, but I don't think most folks have consciously tried to properly blind and suppress OPFOR in the turns before the air arrives. Air in TacOps is currently limited to medium to low level delivery. Such approaches can't be recklessly used until OPFOR has been very heavily attrited. If you really want to get air in earlier, you will have to dedicate all your arty to suppressing and or smoking as many enemy units near the target as possible. First put arty smoke on the bigger nearby OPFOR units (leaving a hole over the target) and then suppress the heck out of the area around it with arty for a few turns. I generally don't try to use air unless there is a heck of a lot of other general fighting going on to distract the OPFOR SAM gunners.

Q: Do the types of aircraft used in air support orders really make a difference? Does one perform better than the other?

A: TacOps air strikes are generic. The names differ only for cosmetic effect. Data for responsiveness, survivability, accuracy, bomb effects, etc. vary a little bit between Blue and Red - the Blue aircraft are more capable.

Casualties/Vehicle Damage

Q: When a unit takes weapon or mobility damage, do all of the subunits suffer the same result?

A: No. All destructive combat results apply to only one team or vehicle at a time. If a vehicle gets weapons or mobility damage, that vehicle is split out of the larger marker and a new marker is created for it.

Q: Too many infantry are surviving the loss of their APCs.

A: The infantry loss rate for dead APCs is a random number from 0 to 100%. Click on those surviving units and see what their personnel count is. You will usually find that only a few guys out of a dozen made it out.

Q: One of my M-1s got a 1% kill on a tank at 3000m. Hey, I'm happy about that, I'm just surprised it was 1% considering that 2500m is an effective range for an M1.

A: 1% sounds like the target was moving in broken terrain and that the firing unit was taking effective return fire or artillery and maybe moving itself - not exactly training range conditions.

Q: In the game, an M-60 MG had the same chance to kill a BTR in the woods from the side as the M-1 did from the front at less than 100m. The SABOT round is much heavier than the RPG and has a greater velocity than the ATGM.

A: Well just tell yourself that the tank SABOT round would kill the BTR extremely dead, while the M60 machine gun would only kill it a little bit dead. Dead is dead, the extent of the overkill is irrelevant. At point blank ranges an M1 and a M-60 MG each have around a 95% chance of hitting a tank or squad sized target (in TacOps there is always a 5% chance of inexplicable failure). A BTR has frontal armor of 20 mm, side of 7 mm, and rear of 5 mm. One M1 SABOT round (DU) can penetrate two, side by side T72 tanks in real life (but not in the game). An M60 machine gun burst can penetrate 25 mm (firing high tech armor piercing ammo). The SABOT round gets through and the M60 mg burst gets through - the BTR is dead so what is the problem? Actually the SABOT round would probably blow right through the BTR without causing a brewup, but what the heck - TacOps assumes that the tank crew would use HE in such a case. Afghan mujahideen had no problem lighting up BTRs with just about anything larger than a rifle when firing into the side hull.

Q: In the scenarios I've played on the defensive, I've noticed the formation of distinct "kill zones" which quickly become littered with a high density of wrecks.

A: There is a great deal of destruction in TacOps. I have gone over and over the combat tables and they appear to be OK, though they do assume that the warriors are willing and well trained. Writing TacOps has convinced me that modern close combat between well equipped and well motivated adversaries would be a bloody business indeed. I don't think this grim lesson came out of Desert Storm very well because only one side was competent.

Computer Opponent

Q: Does the AI always work the same in a given scenario?

A: No. The computer opponent has multiple personalities or levels of competence imbedded in each scenario. Most scenarios include multiple different AI setups, opening moves, and general battle plans - some have dozens of variations. Some plans are better than others. Which one you get is a random event. Most scenarios feature at least one OPFOR plan or personality that is intentionally not particularly competent - lets call him LtCol Dufus. Oddly, his reckless massed charges are sometimes quite effective if the Blue player has a gap in his recon screen. If Dufus blunders through such a gap, he is such a fast mover that he can be off the west edge of the map before you can reposition your defense.

Q: Why doesn't the AI work with custom scenario templates?

A: Standard scenarios have a big part of the computer opponent (AI) imbedded in the scenario file so that the AI can be modified to take maximum advantage of the missions, terrain, and situation for that scenario. Custom scenario templates have no constraints, no boundaries. Unless

I let the user program the AI - a bad idea since that would spoil the play of the game for the creator - the computer opponent for such games would tend to be consistently weak. In this case I would rather provide no AI than to provide bad AI.

Q: The OPFOR off map artillery kept pasting that lump of forest (which, I admit, *would* be a great avenue of attack for my forces, but I didn't attack there) all day long. Even when the AI opponent KNEW that I was attacking from the North side of the Urban area, it kept pasting the trees. Why would it do that?

A: Beats me, but it does prove that the AI does not cheat.

Q: Shouldn't the AI opponent be able to guess that I am up to something when it detects overlapping smoke discharges in an open area? If I saw something like that, I would gamble that my opponent was up to something and move at least some units over to investigate.

A: Were I to add this to the logic, players would then just use it to suck the AI into traps - a programmer just can't win. I don't really want the AI to be investigating things like this. What I want is for the AI to work its overall battle plan and to stay in character as much as possible.

Cross-Platform Compatibility

Q: Can the Macintosh and the PC Windows versions play each other?

A: Yes.

Defilade

Q: Can tanks move from a full defilade position to a hull defilade firing position?

A: Beyond the scale of TacOps. This kind of firing behavior is assumed to be happening. Such assumed behavior is addressed by having most weapon firing probabilities be lower in the game than what would be expected from firing on a training range.

Q: The "]" symbol on the unit orders menu generally means "dig in," right? Do we assume that means some degree of camouflage as well?

A: TacOps defilade means "some kind of cover" not true "hull defilade". Definitely does not represent "digging" in. Merely means that a unit has expended some period of time to find the best place available locally to flop down. Most of the current scenarios reflect battles of hasty positions and rapid movement.

Email Play

Q: Although I understand the programming nightmares of writing modem routines for e-mail games, having to use a separate comm package and sending files back and forth that way will deter some folks....it will be seen for what it is...a work around.

A: Email play is very important to me for the future of wargaming and the TacOps approach is no work around. It is a recognition of current modem communications realities. It is my conviction that the best, most stable email or modem interface will always be found by using a popular commercial program designed and maintained specifically for that purpose. Modem links with local and national BBS are still annoyingly undependable and complex despite all the other advances in personal computing. If a user is familiar and confident with ZTerm, Microphone, or whatever (i.e. the user has finally managed to make a comm program work reliably with his system configuration and perhaps several BBSs), why make him go through all the same setup hassles again with a custom game comm interface?

Q: We need some smaller scenarios with shorter game length for human to human play by email. I don't think a 120 turn game is going to be very useful to the dedicated denizens of cyberspace.

A: Take a closer look at the scenario set. Some of the small scenarios have very small maps, low game lengths, and only a few units. They were designed specifically for casual email play.

Q: You should not need to save a different saved game for every time you quit after playing an e mail game. A simple save should update the game that you are playing. This would greatly simplify the playing of email.

A: The email game user is free to accept the default save name (the prudent path) or to change it to another one and overwrite a previous file (the reckless path). The reason for the seemingly duplicative saved games in email play is that I don't trust anything outside TacOps to be guaranteed once I turn on a modem and connect via a telephone line with another user or a BBS. I approach telecomputing with the assumption that my family, the modems, the phone connection, and the attached comm software will all conspire to ruin my game in progress with every data transfer. This is my frequent experience when telecomputing with any program. I try to offer a backup system in TacOps that will offer the greatest chance of allowing a user to recover from modem lockups and dropped connections without losing his game in progress.

Factory Defaults

Q: Perhaps it's just my level of play, but the M1A1 tank seems awfully easy to kill. In Team McMains, in six attempts I have yet for any tanks to survive. As soon as I start firing, the OPFOR responds with missiles and a few turns later it's all over but the music.

A: It is not you, it is the factory default game preferences settings. The factory defaults are designed to produce a equal game "out of the box". The factory defaults give OPFOR very much improved, warheads for its ATGMs - most can kill an M1 from any aspect. If you want to simulate the current military situation (or at least conventional wisdom on it) set the preferences to withhold the improved OPFOR warheads and to withhold OPFOR thermal sights.

Q: I think the factory defaults should be the real world situation.

A: I think the defaults should be what creates the most balanced game "right out of the box". Otherwise, some neophyte players who may not realize how big the current gap is between our stuff and OPFOR's would see the game as a walkover for Blue. They would lose interest before getting deep enough into the manual to figure out the preference settings needed for a more challenging game.

Formations

Q: Is it possible to have Red and Blue forces move in formation?

A: OPFOR forces under command of the computer opponent move in platoon, company, even regimental formation much of the time - terrain and situation permitting. When humans are playing, formation movement is up to them to coordinate via the orders they give to individual units. Attack and movement formations are an important part of tactical level combat. Making this automatic would eliminate a major way of differentiating between the skill of opposing players.

Game Design

Q: Did you go up to Cold Wars this past weekend? I got involved in some excellent micro-armor battles & it occurred to me that you have a captive audience for TacOps among these folks.

A: Captive audience? Not likely. Avid miniaturists don't have any money left to buy computers. Seriously, the primary original motivations for TacOps were (1) so that I could play miniatures without having to setup the lead and terrain and (2) so that I did not have to wargame with six manuals under my arm, a tape measure in my left hand, and a dozen differently colored dice in my right.

Game Run Out

Q: In the larger scenarios, once the Player has lost all hope there needs to be an escape sequence to end the scenario. Even in the Team McMains scenario in one of my early and POOR attempts, I had to Command B about 15 times after I was no longer combat effective in order to have the enemy meet his objective.

A: Use the "Do Game Run Out" item in the Combat menu.

Graphics

Q: Having read your excuses about using a minimal set of colors, I can only suggest that you recognize that current state of the art war games are using millions of colors.

A: Current state of the art war games are also commonly being removed from many owners' disk drives after a few weeks to make room for something else, and because it takes forever to scroll or redraw their maps.

Q: Why are you using low resolution graphics, my computer can display millions of colors and you only use a few?

A: Arrggghhhh!!!! What is the big deal with lots of colors? If a game only needs a few colors to properly and pleasingly communicate information, why have more? I would like to do lots of colors, it would mean less work for me, but many if not most computer owners do not yet have the system memory, speed, or disk storage to cope well with high end color games that eat up huge amounts of hard disk space and or system memory. I do not choose to participate in the current industry practice of leaving behind thousands of gamers with every new game.

Q: Some of the dialog boxes are awfully plain and old fashioned looking. You should color and make them all consistent.

A: I believe that purely decorative details in windows are distracting and that they complicate learning how to play a game. The purpose of an information window is to quickly and clearly communicate information. The purpose of a control window is to get information from the user or to allow the user to perform some game activity. Decorations get in the way of these goals. If something is not a control or does not provide useful information then it will not be in a TacOps window. The plain dialogs also snap on and off the screen very quickly and use a minimum of code and memory to operate. Rant time - high color, fancy windows and dialogs are nice, but they are "fluff". They probably don't even register on the average gamer's mind after the first few hours of play. Pretty pictures are not what keeps a war game on a user's hard disk month after month while newer games are loaded and then discarded. How many times have we heard the phrase, "looked great, but the game was awful ... lasted about a week." ? I would rather put my development time into new features.

Q: How about moving some or all of the menu items into a floating toolbar?

A: My design philosophy is to reserve the maximum possible screen area for map display. I expect I'll add some optional toolbars when small screens are truly a thing of the past.

Q: The big unit icons look completely different from the little icons. They should probably look similar.

A: The big icons look different because half of the playtesters liked small square symbols, while the other half liked big rounded ones. This way both groups can be happy.

Q: Every so often during the game turns the screen jumps around without me doing anything.

A: The program will often scroll the map automatically to a different place on the map because something has happened there that you should be aware of. Usually it is because a hidden enemy unit suddenly became visible or to show you where artillery or air support is impacting.

Q: I want to be able to zoom the map for greater detail.

A: I don't think I can currently risk increasing the zoom level of the map. The map display routine in TacOps depends on the entire map residing in memory even though the user only sees a portion of it. That is the primary reason why TacOps scrolls so quickly and smoothly.

Q: How about a map and scenarios of Fort Hood and Fort Irwin (the National Training Center) for a scenario pack?

A: I want to do these plus some Army training areas in Germany and the Marine Corps desert training center at 29 Palms, California, but I am concerned that the maps would not be realistic enough until I get more elevation levels into the program. There are a lot of radical (to say the least) elevation changes at Ft Irwin and 29 Palms. I think doing a poor job of replicating such well known terrain would offend more people than it would please.

Levels of Victory

Q: Why doesn't the game provide levels of victory such as marginal, good, excellent, etc.?

A: Specifying victory in levels would boil down to a subjective judgment on my part about what is important under given circumstances and forcing the users through the game code to accept that judgment. In gray areas like this, I prefer to not force my views on others.

Minefields

Q: Do mines naturally degrade through attrition?

A: Yes, one or two screen pixels per explosion.

Morale

Q: Morale: It's kind of unrealistic, I think, for all sides to fight battles of annihilation.

A: You could just as easy stipulate that the current high loss level in TacOps includes the folks who have simply chosen to remove themselves from harms way. Morale must be approached very cautiously - big potential here for making a lot of gamers very unhappy. Many people have an absolute hatred for morale rules in any form. You might also consider that nose to nose tactical battles between well equipped, well trained, well motivated armored units might often be battles of annihilation. Troops on foot especially can not easily outrun artillery or armor - their personal safety depends on closing with armor when trapped in the open, and in standing and fighting when in covered positions. Morale fans are free to set personal goals and victory

conditions that call for breaking contact after certain casualty percentages, but I don't think I should force it on everyone with game code.

Movement Speeds

Q: I would like to have more control over the speed of unit movement. There are times when I want to move more slowly on roads and clear terrain.

A: At present there is no user speed control in TacOps. The current speeds are a compromise, but for vehicles they are a bit fast for "contact imminent" and a bit slow for rear area movement. I have not been able to develop a way to give the user more precise control of the speed of his units that does not hopelessly bog the game down with hundreds of more mouse clicks per orders phase. I will continue to work on it. In the meantime, you can use the "Delay Button" in the orders dialogue to tell a unit to pause in place for 15 seconds per button press. Once you get the hang of it, it works pretty well at slowing units down.

Q: Infantry shouldn't slow down so much in the woods.

A: Dismounted troops slow down in close terrain due to caution and fear, not because it is hard to walk.

Q: Why do units with thermal sights slow down when driving through smoke?

A: Thermal sights are good for targeting hot vehicles and warm people, but they don't do much for cross country driving. The kind of thermal sights that we can afford to put in ground vehicles paint colored blobs on a small TV like monitor to represent things that are significantly hotter than their natural surroundings. Terrain is indistinct since it is all pretty much the same temperature.

Opposing Force (OPFOR)

Q: OPFOR sure looks to me like the former Soviet Union. Aren't you keeping up with current events?

A: I am not picking on the former Soviet Union per se. I hope and expect their democratic reforms to take root. However, Soviet equipment has been cheap and available for years, it is probably the most widely exported and widely used in the world. Whoever we find ourselves fighting, it is highly likely that they will be using Soviet equipment. It is also highly likely that they will be using Soviet style tactics since they are quite useful for low to mid tech, poorly trained armies. The best I can do to sidestep politically correct fanatics and still get a contemporary game out is to name the enemy as "OPFOR" - opposing force.

Q: It is well known that OPFOR tactics are very regimented and inflexible. OPFOR human players should have to cope with this.

A: The computer opponent usually follows a standard OPFOR battle drill but I don't want to force this on a human player. The user, who we should remember has paid good money for the privilege, should be allowed to use whatever tactics he wants.

Q: Does the FOT (T-90?) really exist?

A: Yes and no. FOT means future OPFOR tank. This nomenclature is unique to TacOps. Several new tanks are under development, but I have very little information on them. I put the FOT in as an option in order to allow more balanced near future scenarios. A TacOps FOT is, game wise, basically an M1A2 painted red.

Resupply

Q: I don't like the resupply method. You should have propositioned supply dumps that can be drawn from like a general Bn supply system. (Use icons to mark dumps.) Bn dumps may be resupplied. A Bn log base with trucks would be more realistic. If a truck makes it to the company, the company is resupplied.

A: Minor resupply is addressed in a very conceptual way with a resupply button in the unit orders dialog. TacOps calculates a reasonable supply of extra items on hand and limited local delivery of more as each scenario starts up. The resupply number (supply points) is a function of the number and types of troops and equipment in the scenario, as well as the expense, bulk, and weight of the ammo that they are using. The function allows a player to avoid being unrealistically limited to a basic load, but it also prevents having too much of the good stuff. I don't see the need to burden the average player with more detail given the time and distance scale of the typical TacOps engagement - less than two hours of battle and less than 20 kilometers of movement. If a user wants to have supply dumps and trace a path to them before resupply he can do that as a personal goal, but I won't force it on people via the program.

Smoke Grenades

Q: The smoke grenade button in the unit orders window is turning gray after a single smoke grenade is used even though additional grenades are available.

A: Vehicle smoke grenades take time to reload (usually from outside the vehicle). The button is dimmed until a couple of minutes have passed to simulate this.

Spotting

Q: Does a unit's facing influence its chances to see or spot things?

A: In general units always have 360 degree observation but their chance of spotting varies with the terrain and situation. Until a firefight starts, any well trained unit expecting imminent contact is going to be constantly visually scanning in all directions. Grunts will be upright and alert, tank commanders will be standing tall in their hatches. Once in contact, everyone who can is going to duck, that unit will become focused more on immediate targets and especially more focused on

enemy units that are sending effective fire their way. This is represented in the game by spotting ability declining during and for a short while after a firefight. It is also represented by not allowing a unit to instantly acquire a new target upon the destruction of an ongoing target - there is a bit of a delay.

Q: Killed units should not spot in the turn they are killed. Maybe you should move the spotting phase after combat resolution.

A: Units that are killed cease spotting at the instant that they are killed, although occasionally a "dead" unit will appear to get off another shot due to the simultaneous fire approach used in TacOps. Spotting can't be after combat resolution because spotting is a precondition to firing.

Q: Spotting is too automatic.

A: Very little in TacOps is automatic. To increase realism and uncertainty, there are extra random die rolls for just about every possible game action, though the more bizarre lapses have a very low probability of happening. Spotting is already definitely not automatic. The chance of spotting increases with the number of units in a given counter/marker, decreases as the stress and pace of operations increase, decreases with movement, decreases with covering terrain, and decreases with other factors that I can not recall at the moment. It is not uncommon for a unit in TacOps to inexplicably not spot and not fire on an enemy unit that seems to be in plain sight - the fortunes of war.

Q: Vehicles should have a reduced chance of spotting to their sides and especially to their rear. Infantry is not affected as much.

A: It is assumed that people in a unit are alert and are constantly scanning in all directions for threats and targets. I do not agree with the excessively strict facing handicaps prevalent in most tactical wargames.

Q: Units in clear terrain disappear frequently. Observing unit is not disturbed in any way and moving unit is in view before disappearing. After a time the unit reappears. Possible that disappearance is due to minor undulations in clear terrain?

A: Correct. This is a randomly generated event that is meant to simulate the many minor variations in terrain and vegetation that are too detailed to be in the game's data base, but that would be present in the real world. It is uncommon except in very flat desert to be able to watch an enemy unit close on your position across several kilometers of even clear terrain without periodically losing it to minor elevation changes in the ground or to a clump of vegetation. The rougher the data base terrain at the unit's location and the less a unit moves, the more often it will "disappear".

Q: Friendly units should obstruct fire.

A: Not appropriate to the ground scale in TacOps. Most of the time, a unit marker in TacOps represents 5 to 10 vehicles spread out over a 150 meters or so. However I am collecting votes on adding a low random chance of fratricide if units are firing over, through, or near friendlies.

Q: I see units firing hundreds of meters through woods and towns all the time. For example a unit at .... fired through a town to hit a unit at .....

A: The units you mentioned were both on high ground and the town was on low ground. They were shooting over the town. Units on high ground, shooting at targets on high ground will shoot over woods and towns that are located on low ground. Otherwise, units can fire into and out of the edges of woods and towns but they can not generally fire through them - there are a very few exceptions to this due to terrain data base oddities.

Standard Operating Procedures (SOP)

Q: You should add more unit SOP options and provide more automated actions for the human player's units.

A: In general TacOps leaves "unit order giving" as much as possible to the user. Having the program make very many more "automatic" decisions for the user will induce either boredom or annoyance. Playtesting indicated that there is little consensus among users on what constitutes common sense and good tactics. There was general consensus though that the game should "largely leave me alone to do what I want with my units - i.e. don't force your ideas of what is realistic on me". Just about any tactic that I "lock" into the program is going to displease as many people as it satisfies. Most of the time a 60 second movement pulse is a small enough time interval for the user to keep units from doing stupid things, like continuing to advance into surprise enemy fire. Certain SOP options were added during playtesting to compensate for occasions when 60 seconds is too long to wait. The pop smoke options fall in this category since popping smoke is a rather instantaneous action for vehicles. Helicopters were given an evasion option due to their very much higher rate of speed. - 60 seconds is too long to wait to let the user regain control of them when they get into trouble.

Suppression

Q: Is there ever a time that suppression is instantaneous?

A: Suppression from mines, arty, and air takes place instantly. Suppression from other weapons takes effect at the end of each 15 second combat pulse. It causes a problem in simultaneity to do direct fire suppression instantly.

Surprise

Q: You might consider a special deal for infantry units in concealed positions that would always give them the first shot.

A: Already in the code. A surprise fire status is given to any unit automatically that is in covering terrain, remains motionless, is unsuppressed, and goes unspotted for a turn or so. Not only do they get the first shot, but they are immune to spotting or return fire for 15 to 30 seconds. This status is also occasionally given to units who do not actually rate it just to keep things unpredictable.

Terrain

Q: Why are there only two ground elevations?

A: This design decision was made long ago and because of the huge amount of code involved I had to stick with it for this version of TacOps. When I started coding TacOps the "average" computer was too slow for more than three elevations - low ground, higher ground, and airborne. Additional ground elevations are now possible given the increased speed of computers released in the last two years and more will be added in future versions of TacOps.

Q: Had a M-1 tank moving in the woods at 150m and it was killed by an RPG. It is unlikely that an RPG would be able to hit a vehicle at such a distance in the woods since a small branch would cause a significant deflection and tree trunks would cause even larger deflections. It is even more ridiculous for an ATGM to be able to fire at targets in the woods, due to the above mentioned problems and the additional problems of wire in the trees, but that also happened.

A: They can in TacOps woods. You may be viewing TacOps woods based on your mental picture of what a typical German forest is like. That is not valid unless you can find something in the game documentation that has defined TacOps woods to be German forest. In a TacOps wood ATGMs can fire 200 meters at reduced accuracy, RPGs can fire 200 meters at reduced accuracy, vehicles can drive anywhere (though at a reduced speed). A TacOps wood is defined by what is possible inside a TacOps wood not by what is possible in a German or Virginia forest or by what is possible in a mesquite thicket at Ft Hood.

Thermal Sights

Q: I was playing Task Force McMains and had a peculiar experience with the thermal sighting capability on the M1A1s. OPFOR hit my armor units with a 122 mm MRL Smoke barrage to obscure his advance. My tanks had no problem engaging and killing his units - with impunity.

A: Well, that is what thermal sights do, they see through most smoke as well as darkness. In the real world, Blue tanks and Blue ATGMs have thermal sights while OPFOR equipment pretty much does not. Use of thermal sights by only the Blue will ruin most scenarios from a "game" standpoint, just as they ruined Desert Storm for the Iraqis.

Troop Capacity of Armored Personnel Carriers

Q: Why do APCs consistently show more troops are loaded than their capacity says will fit?

A: The APC troop capacities shown in the unit information window represent the "school solution". The program allows them to be exceeded slightly. In real life there always seems to be room for a few more guys in or on top of a vehicle - up to a point.

Undo Commands

Q: Why don't you have undo commands? I frequently would like to take something back, especially when marking artillery targets and I hit the wrong radio button.

A: Unfortunately in this and other places where honest mistakes could occur, I still have to code to make it as inconvenient as possible for cheating to take place in two player human Email or network games. I can not make cheating impossible, but I can make it so tedious that almost no one would want to go to the trouble. It is not so much that I think players would actually cheat one another. Rather, it is that I want to provide some guarantees so that when someone gets the occasional run of "hot dice" the other player will not have to wonder if all is on the up and up. I have seen gaming friendships break up on just such suspicions.

Appendix D - Tables Of Organization And Equipment

The following Tables of Organization and Equipment are notional descriptions of the primary Canadian Army, US Marine Corps, US Army, and OPFOR tactical level ground combat units. Logistic support elements are not shown for the most part. These charts provide a best case description of likely organization in a full mobilization, general war situation. Units in real life will seldom conform to these charts in peacetime due to frequent national and local tinkering with organization and equipment, changing budget conditions, and political considerations. Units in combat will seldom match these charts due to cross attachment, wear and tear, and casualties.

Canadian Army

Below are Tables Of Organization and Equipment for a notional 20th Canadian Mechanized Brigade Group that is based on the exercise structure used at the Canadian Land Force Command and Staff College. Canada uses the term regiment to designate units similar in size to US battalions in the Armor, Artillery, and Engineer Corps. In reconnaissance and armor units a Canadian squadron is similar in size to a US battalion and a troop is similar to a US platoon. Canadian infantry terms for infantry are similar to those of the US except that a unit the size of a US squad is referred to as a section.

20 Canadian Mechanized Brigade Group
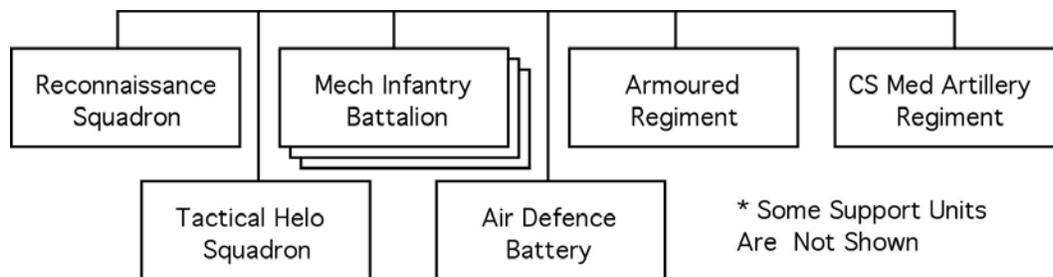
Brigade Headquarters - 20 Canadian Mechanized Brigade Group
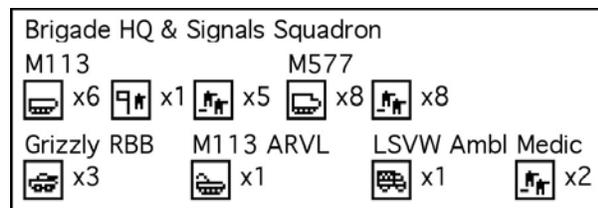
Reconnaissance Squadron - 20 Canadian Mechanized Brigade Group

Squadron HQ
Coyote Cmd   M577   M113   Grizzly RBB
[icon] x1   [icon] x1   [icon] x2 [icon] x2   [icon] x3 [icon] x3   [icon] x1

Reconnaissance Troop
Coyote Cmd   Coyote RMSS   Coyote MMSS   Bison   Eryx
[icon] x1   [icon] x1   [icon] x3 [icon] x3   [icon] x3 [icon] x3   [icon] x2   [icon] x2

Administration Troop
M113   M548 Ammo   M548 POL
[icon] x1 [icon] x1   [icon] x4   [icon] x2

M113 MRT   M113 MRV   M113 Ambl   Medic
[icon] x3 [icon] x3   [icon] x1   [icon] x2   [icon] x4

Support Troop
M113
[icon] x1 [icon] x1

M113 E/PNR   Eryx
[icon] x4 [icon] x4   [icon] x4

Infantry Battalion - 20 Canadian Mechanized Brigade Group

Battalion Cmd Section
M113
[icon] x2 [icon] x1 [icon] x1

Administration Company
M113   M113 ARVL   M113 Ambl   Medic
[icon] x1 [icon] x1   [icon] x2   [icon] x4   [icon] x8

Rifle Company
M113   Eryx   60mm
[icon] x3 [icon] x1 [icon] x2 [icon] x1   [icon] x1

Rifle Platoon
M113   60mm   Rifle Section
[icon] x4 [icon] x1   [icon] x1   [icon] x3 (Includes Eryx x3)

CSS Section
M113   M548 Ammo M548 POL
[icon] x1 [icon] x1   [icon] x2   [icon] x1

M113 ARVL   M113 Ambl   Medic
[icon] x1   [icon] x1   [icon] x2

HQ/Combat Support Company
M113
[icon] x3 [icon] x1 [icon] x3
M577   Grizzly RBB
[icon] x3 [icon] x3   [icon] x1

Reconnaissance Platoon
Coyote Cmd   M577   Sniper Team
[icon] x1 [icon] x1 [icon] x1 [icon] x1 [icon] x4

Coyote RMSS   M548
[icon] x10 [icon] x10   [icon] x2

Pioneer Platoon
M113
[icon] x1 [icon] x1

M113 E/PNR
[icon] x4 [icon] x4

Mortar Platoon
M577   Coyote Cmd   M548
[icon] x1 [icon] x1   [icon] x1 [icon] x1   [icon] x3 [icon] x3

M113 FOO   M113   Bison Mortar
[icon] x2 [icon] x2   [icon] x2 [icon] x2   [icon] x8

Anti-Armour Platoon
M113   M577
[icon] x1 [icon] x1   [icon] x1 [icon] x1

M548   M113 TUA
[icon] x2   [icon] x12

Armoured Regiment - 20 Canadian Mechanized Brigade Group

Regimental Command Section
Leopard Cmd   M113
[icon] x2   [icon] x1 [icon] x1

Regimental HQ Group & HQ Squadron
M577
[icon] x2 [icon] x2
M113   Grizzly RBB
[icon] x2 [icon] x2 [icon] x1
Taurus ARV   M113 ARVL
[icon] x1   [icon] x1
Coyote Cmd   Coyote RMSS
[icon] x1 [icon] x1   [icon] x8 [icon] x8

Armoured Squadron
Leopard Cmd
[icon] x2

Armoured Troop
Leopard
[icon] x4

M113   Leopard Dozer
[icon] x1 [icon] x1 [icon] x1

Admin Troop
M113   M113 Ambl   Medic   M548 Ammo
[icon] x2 [icon] x2 [icon] x2   [icon] x4 [icon] x2
M113 MRT   Taurus ARV   M548 POL
[icon] x3 [icon] x3 [icon] x1   [icon] x2

Close Support Medium Artillery Regiment - 20 Canadian Mechanized Brigade Group

Arty TAC/FSCC Section
M577   M113
[icon] x2 [icon] x2 [icon] x1 [icon] x1

Regt HQ/Sevices Battery
M577   M113   M113 CM Radar Grizzly RBB
[icon] x2 [icon] x2 [icon] x6 [icon] x6 [icon] x3   [icon] x1
M113 MRT   M113 ARVL   M113 Ambl Medic
[icon] x2 [icon] x2 [icon] x2   [icon] x2   [icon] x4

Close Support Artillery Battery - Self Propelled
M113   M113 FOO
[icon] x1 [icon] x1 [icon] x4 [icon] x4

Firing Troop
M577
[icon] x2 [icon] x2
M113
[icon] x4 [icon] x4
M109   M992 FAASV
[icon] x6 [icon] x6

Support Troop
M113
[icon] x1 [icon] x1
M578 MRV   M113 MRT
[icon] x1   [icon] x2 [icon] x2
M113 Ambl Medic
[icon] x1   [icon] x2

Air Defense Battery - 20 Canadian Mechanized Brigade Group

Command Section & Ops Troop
M113   M577
[icon] x2 [icon] x1 [icon] x1 [icon] x2 [icon] x2

Support Troop
M113 MRT   M113 ARVL M548 Cargo   M113 Ambl   Medic
[icon] x8 [icon] x8 [icon] x1 [icon] x1 [icon] x1 [icon] x2   [icon] x4

ADATS Troop
ADATS   M113
[icon] x1 [icon] x2 [icon] x2

ADATS Section
ADATS   M548 Ammo
[icon] x1 [icon] x1

Javelin Troop
M113
[icon] x2 [icon] x2

Javelin Section
M113   M113
[icon] x1 [icon] x1 [icon] x6 [icon] x6

Tactical Helicopter Squadron - 20 Canadian Mechanized Brigade Group

Tactical Helo Squadron
Griffon   Griffon   Griffon
[icon] x8 [icon] x8 [icon] x8

US Army

US Army Mechanized Infantry Battalion

HQ Company (HHC)
M3 x2   M577 x8   M113 x19   x7

Scout Platoon
M3 x6   x6

Rifle Company
M2 x13   x13   x9

Antiarmor Company
M901 x12   M113 x4

Mortar Platoon
M106 x6
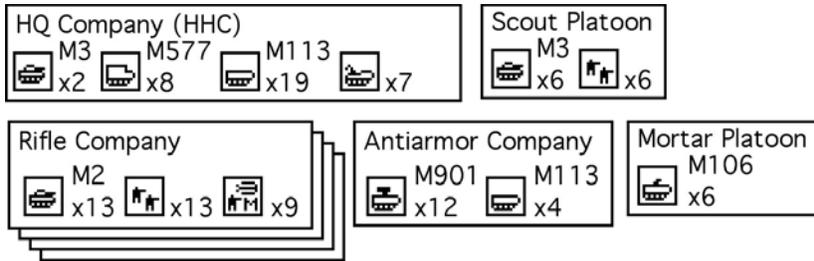
US Army Armored (Tank) Battalion

HQ Company (HHC)
M1 x2   M577 x8   M113 x13   x7

Tank Company
M1 x14

Scout Platoon
M3 x6   x6

Mortar Platoon
M106 x6
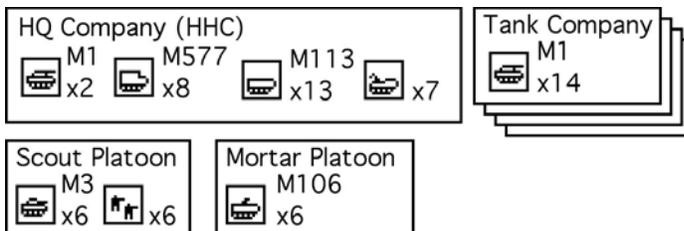
US Army Cavalry Squadron
(of a Heavy Tank or Mech Division)

HQ Company (HHC)
M3 x2   M577 x6   M113 x3
M981 x2   x2   UH60

Cavalry Scout Troop
M113   M3 x19   x19
M577   M106 x3

Air Cavalry Troop
AH1 x6   OH58 x4

US Army Armored Cavalry Regiment

Armored Cavalry Squadron

HQ Company (HHC)
M3 x2   M577 x7   M113 x11   x3   x6

Armored Cavalry Troop
M3 x12   x12
M1 x9   M106 x2

Tank Company
M1 x14

Howitzer Battery, 155m SP
M109 x8   M992 x8
M577 x2   M981 FIST x6

Combat Aviation Squadron

Some units have AH64 Apache in place of AH1 Cobra

Headquarters Troop
OH58   UH60 x18   EH1 x3

Air Cavalry Troop
AH1 x4   OH58 x6

Attack Helicopter Co
AH1 x7   OH58 x4

US Marine Corps

USMC Rifle Regiment
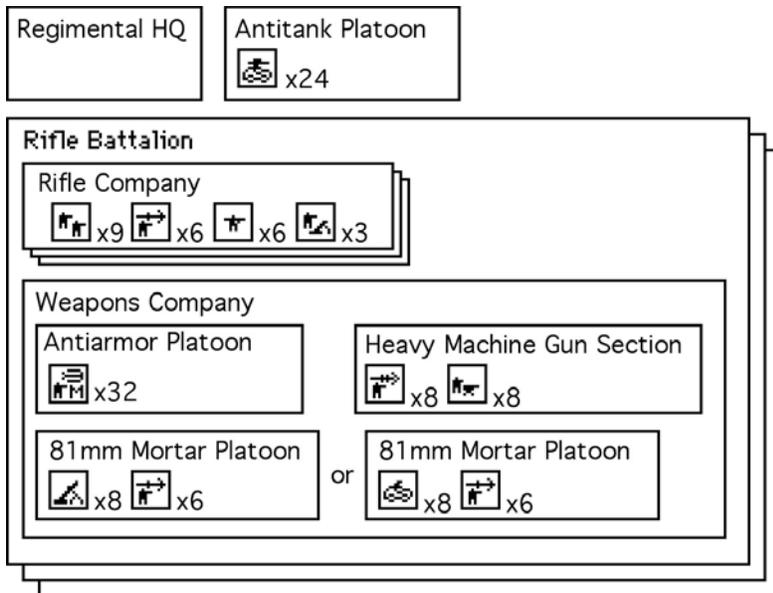
USMC Rifle Battalion (Mech)
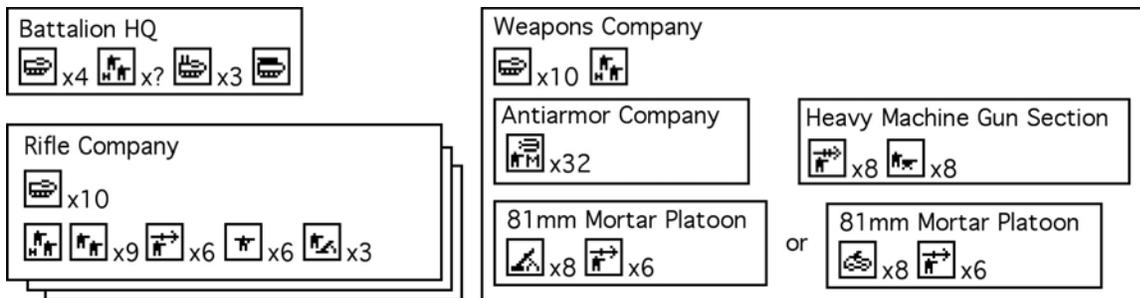
USMC Rifle Battalion (Mech) (Extra AAVs)
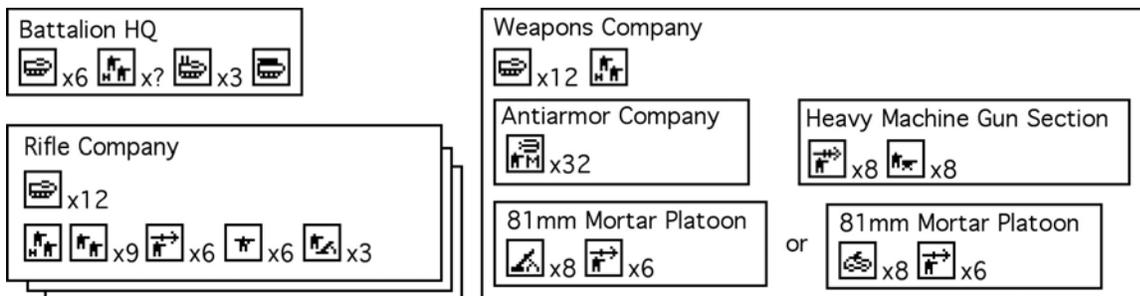
USMC Light Armored Infantry Battalion
(notional structure, actual structure varies across Marine Divisions)
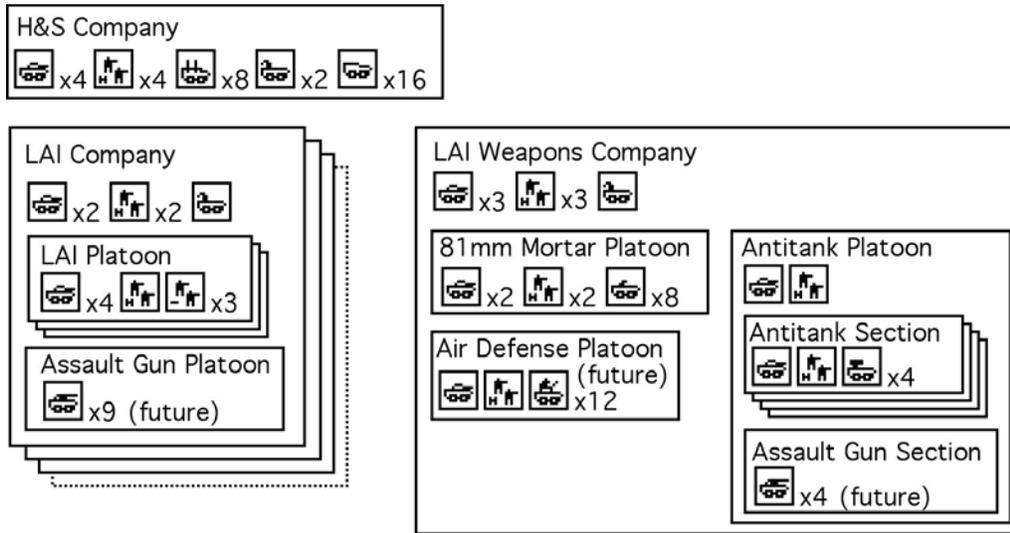
USMC Tank Battalion
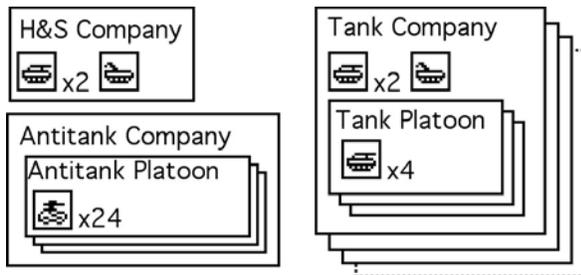
USMC Assault Amphibian Battalion
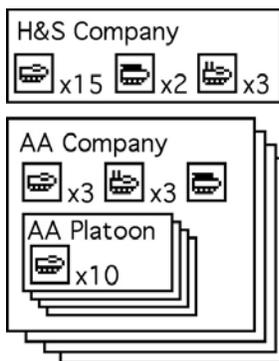
OPFOR

OPFOR Motorized Rifle Regiment (BMP)
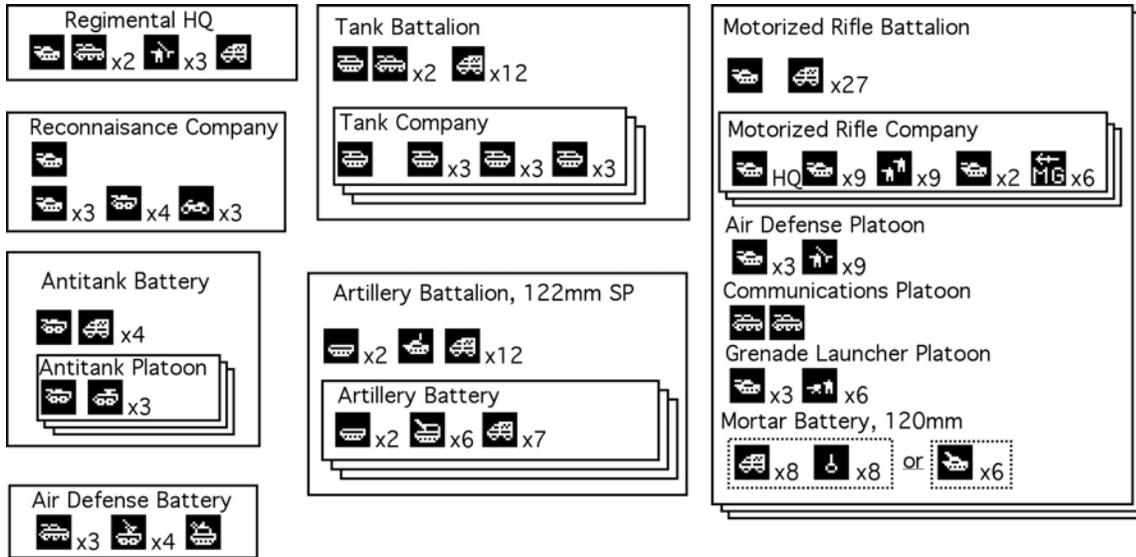
OPFOR Motorized Rifle Regiment (BTR)
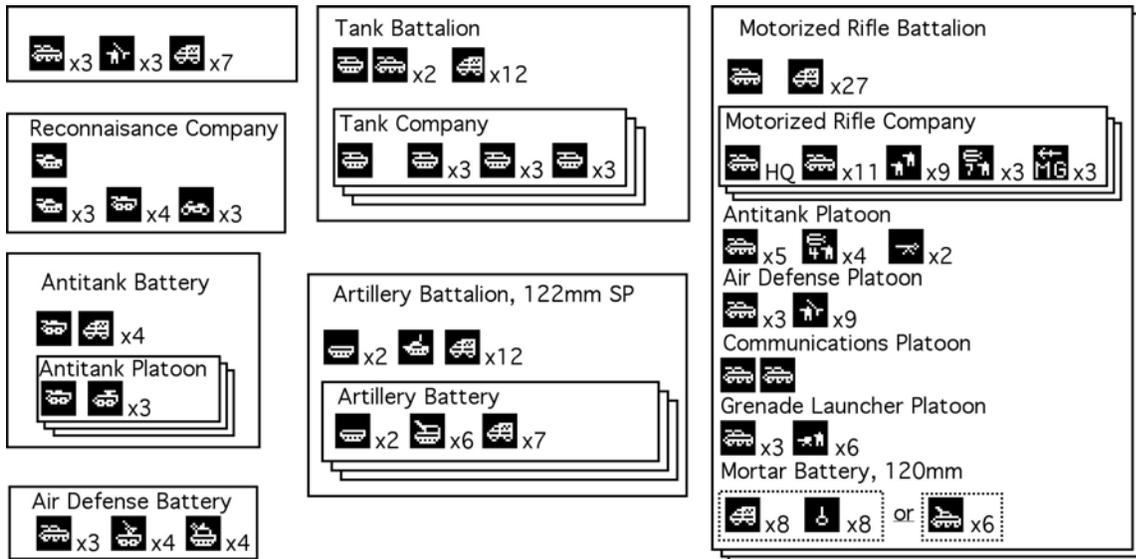
OPFOR Tank Regiment
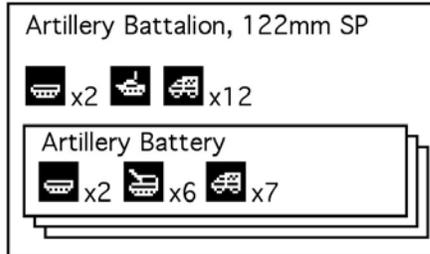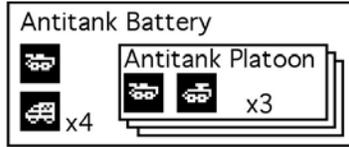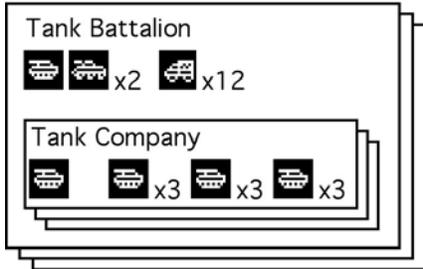
Appendix E - Unit Lethality Values

TacOps provides the user with a limited ability to alter scenarios through the deletion of selected startup units as well the addition of optional units. A point system is provided to help guide players who want to balance or unbalance a given scenario - perhaps for a friendly handicap for a more skilled player. The values shown below are intended to reflect a unit's lethality against appropriate targets and or its general usefulness in combination with other units in good weather and average terrain. For example the AH64 Apache helicopter has a very high point value. Its value is based primarily on its personal lethality against armored vehicles. The Unmanned Aerial Vehicle (UAV) is also very highly rated, but its value is based primarily on the enhanced lethality that its presence gives to other units, particularly off map artillery.

The points shown are for one infantry team or squad, or one heavy weapon team, or one vehicle. For example, one T80 tank is worth 85 points while a T80 tank company with 10 tanks would be worth 850 points (10 x 85).

Australia and New Zealand

Australian & New Zealand Units	Points	Remarks/TacOps Usage
APC, M113 T50 7.62mm	40	AU w fully enclosed turret
APC, M113 T50 7.62mm	40	AU w fully enclosed turret
APC, M113 T50 12.7mm	42	AU w fully enclosed turret
FSV, M113 25mm A	44	AU 25mm auto cannon
FSV, M113 25mm B	45	AU 25mm auto cannon w thermal sights
FSV, M113 76mm	48	AU 76mm gun
Inf, Section P9	35	AU Standard Australian inf section
LUV, LR 4x4	12	AU Light wheeled utility vehicle
LUV, LR 4x4 GL	37	AU w 40mm auto grenade launcher
LUV, LR 4x4 HMG	32	AU w 12.7mm machine gun
LUV, LR 4x4 LMG	31	AU w 7.62mm machine gun
LUV, LR 4X4 SOV + GL	37	AU w 40mm auto grenade launcher
LUV, LR 4X4 SOV + HMG	32	AU w 12.7mm machine gun
LUV, LR 4X4 SOV + LMG	31	AU w 7.62mm machine gun
LUV, LR 6x6	12	AU Light wheeled utility vehicle
LUV, LR 6x6 w HMG	31	AU w 12.7mm machine gun
LUV, LR 6x6 w LMG	31	AU w 7.62mm machine gun
LUV, Motorcycle	5	AU
RV, Leopard ARVM	40	AU Tracked recovery vehicle
Tank, Leopard 1A5	75	AU w 7.62mm machine gun
Inf, Section P10	35	NZ standard infantry section
Inf, Section P6	30	NZ future inf section

Canada

Canadian Unit	Points	Remarks/TacOps Usage
APC, Ambulance Bison	40	Wheeled armoured ambulance
APC, Ambulance Grizzly	40	Wheeled light armoured vehicle
APC, Ambulance M113	1	Tracked ambulance
APC, Bison Command Post	40	Wheeled Command and control vehicle
APC, Bison	40	Wheeled light armoured vehicle
APC, Coyote Command	45	Wheeled command and control vehicle
APC, Grizzly Radio Rebroadcast	40	Wheeled armoured radio rebroadcast vehicle
APC, Grizzly	40	Wheeled armoured infantry section carrier
APC, LAVIII ISC (+)	45	Infantry section carrier
APC, LAVIII ISC	45	Infantry section carrier
APC, LAVIII PNR (+)	45	Engineer/pioneer vehicle
APC, LAVIII PNR	45	Engineer/pioneer vehicle
APC, LAVIII TCP (+)	45	Command and control vehicle
APC, LAVIII TCP	45	Command and control vehicle
APC, M113 E/PNR	40	Engineer/Pioneer vehicle
APC, M113 MRT	40	Mobile repair team
APC, M113 PWS	42	Protected weapons system
APC, M113	40	Tracked vehicle
APC, M577 Command Post	50	Command and control vehicle
ATGM, Eryx P2	28	Dismounted ATGM
ATGM, Milan3 P3	36	Possible future ATGM for CA
ATGM, TOW Team P4	44	Tripod TOW ATGM launcher
ATGMV, Iltis LUVW TOW	44	Light utility vehicle w TOW ATGM
ATGMV, LAVIII TUA (+)	62	w TOW ATGM under armour
ATGMV, LAVIII TUA	62	w TOW ATGM under armour
ATGMV, M113 + Milan3	55	Possible future system for CA
ATGMV, M113 TUA	60	w TOW ATGM under armour
FAASV, Arty Ammo Supply Veh M992	60	Tracked ammo carrier for M109 SP Howitzer
FSCE, FOO Team P2	40	Artillery observers
FSCV, FOO/MFC M113	40	Forward observer/mortar fire control
FSCV, LAVIII FOO/MFC (+)	45	Forward observer/mortar fire control
FSCV, LAVIII FOO/MFC	45	Forward observer/mortar fire control
FSV, Cougar	50	Wheeled light armoured fire support vehicle
FSV, Coyote	45	Wheeled fire support vehicle
Helo, CH146 Griffon	80	Transport helicopter
Howitzer, SP 155mm M109	225	Self-propelled howitzer
Howitzer, Towed 105mm LG1	190	Wheeled howitzer
Inf, Engineer Team P4	15	Engineer team
Inf, HQ Command [-] P4	15	Command element
Inf, HQ Command P8	20	Command element
Inf, HQ Comms Tm P4	15	HQ communications personnel
Inf, HQ CSS Tm + LMG P4	18	HQ combat service support personnel

Inf, HQ CSS Tm P4	15	HQ combat service support personnel
Inf, HQ Ops Tm + LMG P4	18	HQ operations personnel
Inf, HQ Ops Tm P4	15	HQ operations personnel
Inf, Medic P1	1	Medical personnel
Inf, Medical Section P9	1	Medical personnel
Inf, MG 5.56mm C9 Team P2	13	Machine gun team
Inf, MG 50cal Team P2	19	Machine gun team
Inf, MG 7.62mm C6 Team P2	15	Machine gun team
Inf, Recce Team P2	26	Reconnaissance team
Inf, Rifles x 2 P2	8	
Inf, Rifles x 4 P4	16	
Inf, Section + Eryx P8	58	Standard rifle section with Eryx ATGM
Inf, Section P6	30	Standard infantry section less ERYX team
Inf, Sniper Team P2	30	
Inf, SRAAW Team P2	26	84mm Carl Gustav AT weapon
Inf, Team w LMG + M203 P4	28	
Inf, Team w LMG P4	20	
LUV, Ammo Carrier M548	40	Tracked cargo carrier
LUV, Cargo Carrier M548	40	Tracked cargo carrier
LUV, Fuel Carrier M548 POL	40	Tracked fuel carrier
LUV, Iltis LUVW	10	Light utility vehicle
LUV, Motorcycle	5	
Mortar, 60mm P2	18	Dismounted mortar team
Mortar, 81mm P7	30	Dismounted mortar team
Mortar, Carrier 81mm Bison	53	Wheeled mortar carrier
Mortar, Carrier 81mm M113	53	Tracked mortar carrier
Radar, Counter Mortar M113	40	Counter mortar radar
RECV, Coyote Recce (M)	45	Wheeled recce vehicle
RECV, Coyote Recce (T)	45	Wheeled recce vehicle with tripod surveillance suite
RECV, Lynx Recce	35	Tracked recce vehicle
RV, Husky AMRV	40	Wheeled light armoured recovery vehicle
RV, M113 ARVL	40	Tracked recovery vehicle
RV, M578 MRV	40	Tracked recovery vehicle
RV, Taurus ARV	40	Heavy tracked recovery vehicle
SAM, Javelin S15 P2	24	Also called Starburst SAM
SAM, M113 ADATS	80	Air defense and anti armour weapon
Tank, Leopard 2A5 Cmd	100	Possible future tank for CA
Tank, Leopard 2A5	100	Possible future tank for CA
Tank, Leopard C1 Cmd	70	Main battle tank, Command
Tank, Leopard C1	70	Main battle tank
Tank, Leopard C1(+) Cmd	80	Main battle tank, Command
Tank, Leopard C1(+)	80	Main battle tank
Tank, Leopard C2 Cmd	75	Main battle tank, Command
Tank, Leopard C2	75	Main battle tank
Tank, Leopard C2(+) Cmd	85	Main battle tank, Command

Tank, Leopard C2(+)	85	Main battle tank
Truck, Ambulance LSVW	12	Ambulance
Truck, Cargo HLVW	12	Truck, heavy
Truck, Cargo LSVW	12	Truck, light
Truck, Cargo MLVW	12	Truck, medium

Civilian/Paramilitary

Elements	Points	Remarks/TacOps Usage
Civil, Ambulance	0	Wheeled ambulance
Civil, Bomb Portable P1	1	
Civil, Bomb Transportable P1	1	
Civil, Car	0	unarmed
Civil, Firetruck	0	unarmed
Civil, Helicopter	0	unarmed
Civil, Truck Large	0	unarmed
Civil, Truck Medium	0	unarmed
Civil, Truck Small	0	unarmed
Civil, Truck w Hvy MG	22	
Civil, Truck w Lt MG	17	
Civil, x1 Dignitary P1	0	unarmed
Civil, x1 Fireman P1	0	unarmed
Civil, x1 Government P1	0	unarmed
Civil, x1 Media P1	0	unarmed
Civil, x1 Medical P1	0	unarmed
Civil, x1 NGO P1	0	Non governmental organization, unarmed
Civil, x1 P1	0	unarmed
Civil, x1 w Pistol P1	2	
Civil, x1 Police Unarmed P1	0	unarmed
Civil, x1 Police w Pistol P1	2	
Civil, x1 Police w Rifle P1	3	
Civil, x1 PVO P1	0	Private voluntary organization, unarmed
Civil, x1 Rescue P1	0	unarmed
Civil, x1 w MG P1	5	
Civil, x1 w Rifle P1	3	
Civil, x1 w RPG P1	5	
Civil, x5 Dignitary P5	0	Unarmed
Civil, x5 Fireman P5	0	Unarmed
Civil, x5 Government P5	0	Unarmed
Civil, x5 Media P5	0	Unarmed
Civil, x5 Medical P5	0	Unarmed
Civil, x5 NGO P5	0	Non governmental organization, unarmed
Civil, x5 P5	0	Unarmed
Civil, x5 w Pistol P5	5	
Civil, x5 Police Unarmed P5	0	Unarmed
Civil, x5 Police w Pistol P5	5	

Civil, x5 Police w Rifle P5	10	
Civil, x5 PVO P5	0	Private voluntary organization, unarmed
Civil, x5 Rescue P5	0	Unarmed
Civil, x5 w Mixed Wpns P5	20	
Civil, x5 w Rifle P5	10	
Civil, x10 Dignitary P10	0	Unarmed
Civil, x10 Fireman P10	0	Unarmed
Civil, x10 Government P10	0	Unarmed
Civil, x10 Media P10	0	Unarmed
Civil, x10 Medical P10	0	Unarmed
Civil, x10 NGO P10	0	Non governmental organization, unarmed
Civil, x10 P10	0	Unarmed
Civil, x10 w pistol P10	6	
Civil, x10 Police Unarmed P10	0	Unarmed
Civil, x10 Police w Pistol P10	6	
Civil, x10 Police w Rifle P10	20	
Civil, x10 PVO P10	0	Private voluntary organization, unarmed
Civil, x10 Rescue P10	0	Unarmed
Civil, x10 w Mixed Wpns P10	35	
Civil, x10 w Rifle P10	20	

Germany

German Units	Points	Remarks/TacOps Usage
APC, SPz Marder 1A3	45	Tracked infantry carrier
APC, TPz Fuchs	50	Wheeled infantry carrier
ATGM, PzAbwTrp Milan P3	36	Dismounted ATGM
ATGMV, JgPz Jaguar 1 HOT	65	Tracked ATGM vehicle w HOT
ATGMV, JgPz Jaguar 2 TOW	60	Tracked ATGM vehicle w TOW
Helo, PAH BO105 AT	180	Observation & light attack helicopter
Inf, PzGrenGrp P6	30	Mechanized infantry squad
Inf, PzGrenTrp P3	15	Mech infantry platoon HQ group
RECV, APC SpPz Luchs A2	33	Wheeled reconnaissance vehicle
RECV, SpPz Fennek	33	Wheeled reconnaissance vehicle
Tank, KPz Leopard 2A5	100	Main battle tank
Tank, KPz Leopard 2A6	110	Main battle tank

US Army and US Marine Corps

US Unit	Points	Remarks/TacOps Usage
AAA, SP M163 Vulcan	35	Tracked AAA
AAA, Towed M167 Vulcan	30	Towed AAA
Aircraft, MV22 Osprey	100	USMC tilt rotor aircraft
APC, AAAVC C&C Vehicle	50	USMC advanced amphibious command and control vehicle
APC, AAAVP	70	USMC advanced amphibious assault vehicle
APC, AAVC7 C&C Vehicle	48	USMC amphibious command and control vehicle
APC, AAVP7	48	USMC amphibious assault vehicle
APC, Ambulance M113	1	Tracked armored ambulance
APC, Ambulance M2 Bradley AMEV	0	Tracked armored ambulance
APC, Ambulance XIAV	1	Wheeled light armored ambulance
APC, LAV25 C&C	40	USMC Wheeled command and control vehicle
APC, LAV25 IFV	45	USMC Tracked infantry carrier
APC, LAV25 Logistics	40	Wheeled cargo carrier
APC, M113	40	Tracked infantry carrier
APC, M2 Bradley IFV	65	Tracked infantry carrier
APC, M2A2 Bradley ENG	65	Tracked engineer carrier
APC, M2A2 Bradley IFV	65	Tracked infantry carrier
APC, M2A3 Bradley ENG	65	Tracked engineer carrier
APC, M2A3 Bradley IFV	65	Tracked infantry carrier
APC, M3 Bradley CFV	67	Tracked scout vehicle
APC, M3A3 Bradley CFV	67	Tracked scout vehicle
APC, M577 Command Post	50	Tracked command and control vehicle
APC, Medical M2 Bradley AMTV	0	Tracked armored ambulance
APC, XIAV C2/TOC	50	Wheeled Command and control vehicle
APC, XIAV Engineer	40	Wheeled engineer vehicle
APC, XIAV ICV AGL	40	Wheeled infantry carrier + auto grenade launcher
APC, XIAV ICV HMG	40	Wheeled infantry carrier + heavy machine gun
ATGM, Dragon2 Team P2	30	Dismounted ATGM
ATGM, Javelin Team P2	42	Dismounted ATGM
ATGM, TOW Team P4	44	Dismounted ATGM
ATGMV, HMMWV AT TOW	46	Wheeled ATGM vehicle
ATGMV, LAV25 AT	62	Wheeled ATGM vehicle
ATGMV, M901 ITV	60	Tracked ATGM vehicle
ATGMV, XIAV TOW	62	Wheeled ATGM vehicle
Attachment, Blade	1	
Attachment, Mine Plow	1	

Attachment, Mine Roller	1	
Boat, Inflatable + Motor	1	Rubber boat
Boat, Inflatable	1	Rubber boat
Boat, Landing Craft Air Cushion	1	Ocean surf capable
Boat, Landing Craft Large	1	Ocean surf capable
Boat, Landing Craft Medium	1	Ocean surf capable
Boat, Landing Craft Small	1	Ocean surf capable
FAASV, Arty Ammo Supply Veh M992	60	Ammo carrier for M109 SP howitzer
FAASV, Arty Resupply Veh Future	60	Ammo carrier
FSCE, COLT Team P3	50	Arty observers with laser designator
FSCE, Forward Observer Team P2	40	Arty forward observer
FSCV, FIST M7 Bradley	85	Tracked artillery direction vehicle
FSCV, FISTV M981	60	Tracked artillery direction vehicle
FSCV, HMMWV Striker COLT	80	Wheeled artillery direction vehicle
FSCV, XIAV FSV	60	Wheeled artillery direction vehicle
Gun, XIAV Mobile Gun System	53	Wheeled gun system
Gun, XLAV25 105mm Assault Gun	53	Future system, assault gun
Helo, AH1 Cobra	260	Attack helicopter
Helo, AH64 CS	400	Attack helicopter
Helo, AH64 GS	400	Attack helicopter
Helo, AH64 Longbow CS	400	Attack helicopter
Helo, AH64 Longbow MR	400	Attack helicopter
Helo, AH64 MR	400	Attack helicopter
Helo, CH46	80	USMC transport helicopter
Helo, CH47	85	US Army transport helicopter
Helo, CH53	90	USMC Transport helicopter
Helo, MH47	100	Transport helicopter
Helo, MH53 Pave Low III	100	Transport helicopter
Helo, OH58 Kiowa AT	180	Observation and light attack helicopter
Helo, OH58 Kiowa GP	180	Observation and light attack helicopter
Helo, UH1N Iroquois	70	Transport helicopter
Helo, UH60 Blackhawk	80	Transport helicopter
Helo, UH60 Mine Dispenser	200	Mine dispensing helicopter
Howitzer, SP 155mm Future	225	Tracked howitzer
Howitzer, SP 155mm M109	225	Tracked howitzer
Howitzer, SP 155mm XIAV	190	Wheeled howitzer vehicle
Howitzer, Towed 105mm M119	190	Towed howitzer
Howitzer, Towed 155mm M198	200	Towed howitzer
Howitzer, Towed 155mm XM777	200	Towed howitzer
Inf, AGL MK19 Team P2	19	40mm auto grenade launcher
Inf, Corpsman P1	1	USMC medical personnel
Inf, Engineer Squad P8	30	Dismounted engineer squad
Inf, HQ Command [-] P4	15	Command element
Inf, HQ Command P8	20	Command element
Inf, Medic P1	1	US Army medical personnel

Inf, Medical Section P9	1	US Army medical personnel
Inf, MG 50cal Team P2	19	Machine gun team, heavy
Inf, MG 7.62mm Team P2	15	Machine gun team, medium
Inf, MG 7.62mm Team P4	19	USMC standard machine gun team
Inf, Recon Team P2	26	Reconnaissance team
Inf, Scout Team P2	13	Usually used as M3 Bradley dismount team
Inf, SMAW Team P2	26	USMC light anti armor weapon
Inf, Sniper Team P2	30	
Inf, Squad P13	41	USMC standard rifle squad
Inf, Squad P9	35	US Army light inf squad
Inf, Team P4	26	USMC LAV25 dismount team
Inf, Team P6	30	US Army mech inf squad (less 1 ATGM team)
Logistics Package	1	Container for supply points
LUV, HMMWV + AGL MK19	37	w 40mm grenade launcher
LUV, HMMWV + HMG	32	w .50 caliber machine gun
LUV, HMMWV + LMG	31	w 7.62 machine gun
LUV, HMMWV Ambulance M997	12	Wheeled ambulance
LUV, HMMWV	12	High mobility multipurpose wheeled vehicle
LUV, Load Carrier M548	40	Tracked cargo vehicle
LUV, M58 Smoke Generator	40	Tracked smoke generator
MCV, HMMWV + MICLIC Trailer	40	Wheeled mine clearing charge launcher
MCV, M60 AVLM Mine Clearing Veh	12	Tracked mine clearing charge launcher
MLV, AAVP7 LMC	48	USMV tracked mine clearing charge launcher
MLV, M548 Mine Dispenser	200	Tracked mine dispensing vehicle
MLV, Truck Mine Dispenser	200	Wheeled mine dispensing vehicle
Mortar, 120mm M120/121 P6	40	Dismounted mortar
Mortar, 60mm P3	21	USMC company mortar
Mortar, 81mm M252 Team P7	30	Dismounted mortar
Mortar, Carrier 120mm M1064	80	Tracked mortar carrier
Mortar, Carrier 120mm XIAV	80	Wheeled mortar carrier
Mortar, Carrier 4.2in M106	58	Tracked mortar carrier
Mortar, Carrier 81mm HMMWV	37	Wheeled mortar carrier
Mortar, Carrier 81mm LAV25	53	Tracked mortar carrier
Mortar, Carrier 81mm M125	53	Tracked mortar carrier
MRL, 227mm MLRS	270	Tracked multiple rocket launcher
MRL, 227mm XHIMARS MLRS	250	Wheeled multiple rocket launcher
OCV, M1 Obstacle Breaching Veh	12	Tracked obstacle clearing vehicle
OCV, M9 Armored Combat Earthmover	12	Tracked earthmover
Radar, AN/MPQ64 Sentinel Ops	20	Wheeled air tracking radar
Radar, AN/TPQ36 Firefinder Ops	20	Wheeled counter battery radar
Radar, AN/TPQ37 Firefinder Ops	20	Wheeled counter battery radar

Radar, AN/TPQ47 Firefinder Ops	20	Wheeled counter battery radar
Radar, Surveillance M113 PPS5	50	Tracked Ground surveillance radar
RECV, XIAV NBC Recce	40	Wheeled reconnaissance vehicle
RECV, XIAV Recce AGL	40	Wheeled reconnaissance vehicle
RECV, XIAV Recce HMG	40	Wheeled reconnaissance vehicle
RV, Recovery Vehicle AAVR7	48	USMC amphibious recovery vehicle
RV, Recovery Vehicle LAV25 AMRV	40	Wheeled Recovery vehicle
RV, Recovery Vehicle M578 ALRV	40	Tracked recovery vehicle
RV, Recovery Vehicle M88A1 MRV	40	Heavy tracked recovery vehicle
RV, Recovery Vehicle M88A2 HRV	40	Heavy tracked recovery vehicle
RV, Recovery Vehicle XIAV MRV	40	Wheeled recovery vehicle
SAM, HMMWV Avenger ADA SAM/AAA	40	Wheeled SAM/AAA
SAM, HMMWV HUMRAAM ADA	60	Wheeled SAM launcher
SAM, LAV25 Air Defense SAM/AAA	53	Wheeled SAM/AAA
SAM, M6 Bradley Linebacker SFV	80	Tracked SAM launcher
SAM, Stinger Team P2	28	Portable surface to air missile
Tank, M1A1	92	Main battle tank
Tank, M1A1D	100	Main battle tank
Tank, M1A1HA	100	Main battle tank
Tank, M1A2SEP	110	Main battle tank
Tank, M1IP	86	Main battle tank
Tank, M551 Sheridan	70	ATGM tank
Tank, M60A1	70	Main battle tank
Tank, M60A3	75	Main battle tank
Tank, XM8 AGS L1	67	Future gun system, level 1 armor
Tank, XM8 AGS L2	70	Future gun system, level 2 armor
Tank, XM8 AGS L3	75	Future gun system, level 3 armor
Truck, Cargo 2.5t M1078	12	
Truck, Cargo 2.5t M1081 LVAD	12	
Truck, Cargo 2.5t	12	
Truck, Cargo 5 ton	12	
Truck, Cargo 5t M1083	12	
Truck, Cargo 5t M1084 MHE	12	
Truck, Cargo 5t M1085 Long	12	
Truck, Cargo 5t M1086 Long MHE	12	
Truck, Cargo 5t M1093 LVAD	12	
Truck, Cargo 5t M923	12	
Truck, Cargo 5t M939	12	
Truck, Cargo M1074/1075 PLS	12	
Truck, Cargo M977 HEMTT	12	Wheeled, heavy cargo vehicle
Truck, Dump 5t M1090	12	

Truck, Dump 5t M1094 LVAD	12	
Truck, Forward Repair System	12	
Truck, Fuel M978 HEMTT	12	Wheeled refueler
Truck, M1070 HET Tank Transport	20	Tank transporter
Truck, M1088 5t + M871 Trailer	12	
Truck, Van 2.5t M1079	12	
Truck, Wrecker 5t M1089	12	
UAV	400	Unmanned aerial vehicle
VLB, M1 AVLHAB Bridging Vehicle	12	Tracked bridge laying vehicle
VLB, M60 AVLB Bridging Vehicle	12	Tracked bridge laying vehicle

OPFOR

OPFOR Unit	Points	Remarks/TacOps Usage
AAA, SP 23mm ZSU-23-4	40	Self-propelled, tracked AAA
AAA, Towed 23mm ZU23	27	Wheeled AAA
AAA, Towed 57mm S60	40	Wheeled AAA
APC, Ambulance BTR	1	Wheeled ambulance
APC, BMD1 IFV	50	Tracked infantry squad carrier
APC, BMD2 IFV	55	Tracked infantry squad carrier
APC, BMD3 IFV	55	Tracked infantry squad carrier
APC, BMP1 IFV	50	Tracked infantry squad carrier
APC, BMP1P IFV	55	Tracked infantry squad carrier
APC, BMP2 IFV	55	Tracked infantry squad carrier
APC, BMP3 IFV	70	Tracked infantry squad carrier
APC, BRDM2	33	Wheeled recce vehicle
APC, BTR80 FAC	40	Wheeled forward air controller
APC, BTR80	43	Wheeled infantry squad carrier
APC, BTR80A	45	Wheeled infantry squad carrier
APC, BTR90	50	Wheeled infantry squad carrier
APC, BTRD (BMD M1979)	45	Tracked infantry squad carrier
APC, BTRT	70	Tracked infantry squad carrier
APC, MTLB	40	Tracked multipurpose vehicle
APC, VTT323 IFV	47	Chinese/North Korean APC
APC, YW531A Type63	40	Chinese/North Korean APC
ATGM, AT13 MetisM Team P3	31	Portable ATGM
ATGM, AT14 Kornet Team P3	41	Portable ATGM
ATGM, AT3 Sagger Team P3	25	Portable ATGM
ATGM, AT4 Spigot Team P3	41	Portable ATGM
ATGM, AT5 Spandrel Team P3	43	Portable ATGM
ATGM, AT7 Saxhorn Team P2	36	Portable ATGM
ATGMV, 9P149 Shturm-S	50	Tracked ATGM vehicle
ATGMV, 9P157 Khrizantema	70	Tracked ATGM vehicle
ATGMV, BRDM2 Spandrel	50	Wheeled ATGM vehicle
ATGMV, YW534 Red Arrow	55	Tracked ATGM vehicle

Attachment, Blade	1	
Attachment, Mine Plow	1	
Attachment, Mine Roller	1	
Boat, Landing Craft Air Cushion	1	Ocean surf capable
Boat, Landing Craft Large	1	Ocean surf capable
Boat, Landing Craft Medium	1	Ocean surf capable
Boat, Landing Craft Small	1	Ocean surf capable
FSCE, Forward Observer Team P2	40	Artillery observers
FSCV, ACRV 1V14/15	60	Tracked artillery forward observer with special equipment
FSCV, AMRV PRP3/4M	50	
Gun, AT 100mm MT12/T12	30	Wheeled anti-tank gun
Gun, AT 125mm 2A45M	34	Wheeled antitank gun
Helo, KA50A HokumA Air Atk	350	Attack helicopter
Helo, KA50A HokumA AT	350	Attack helicopter
Helo, KA50A HokumA Recon	350	Attack helicopter
Helo, KA52 HokumB Air Atk	350	Attack helicopter
Helo, KA52 HokumB AT	350	Attack helicopter
Helo, KA52 HokumB Recon	350	Attack helicopter
Helo, Mi24D Hind	300	Attack helicopter
Helo, Mi24E Hind	300	Attack helicopter
Helo, Mi24F Hind	300	Attack helicopter
Helo, Mi26 Halo	100	Transport helicopter
Helo, Mi28N Havoc Air Atk	350	Attack helicopter
Helo, Mi28N Havoc AT	350	Attack helicopter
Helo, Mi28N Havoc Recon	350	Attack helicopter
Helo, Mi2T Hoplite Transport	85	Utility Helicopter
Helo, Mi2URN Hoplite Recon	180	Utility Helicopter
Helo, Mi2URP Hoplite AT	180	Utility Helicopter
Helo, Mi2US Hoplite Gun	180	Utility Helicopter
Helo, Mi8/17 HIP Gunship	200	Utility Helicopter
Helo, Mi8/17 HIP Mine Dispenser	200	Mine laying helicopter
Helo, Mi8/17 HIP	85	Transport helicopter
Helo, SA341H Gazelle Recon	180	Utility Helicopter
Howitzer, SP 122mm 2S1	150	Tracked Self propelled howitzer
Howitzer, SP 122mm Type83	150	Tracked Self propelled howitzer
Howitzer, SP 152mm 2S3	225	Tracked Self propelled howitzer
Howitzer, SP 152mm 2S5	225	Tracked Self propelled howitzer
Howitzer, Towed 122mm D30	190	Towed howitzer
Howitzer, Towed 152mm 2A65	200	Towed howitzer
Howitzer, Towed 152mm D20	200	Towed howitzer
Inf, AGL AGS17 Team P3	25	Automatic grenade launcher
Inf, Command Observation Post P6	50	Artillery forward observer
Inf, Engineer Squad P10	30	Engineer squad
Inf, HQ Command [-] P4	15	HQ command personnel
Inf, HQ Command P8	20	HQ command personnel

Inf, Medic P1	1	Medical personnel
Inf, Medical Section P9	1	Medical personnel
Inf, MG 5.45mm RPK Team P4	20	Machine gun team
Inf, MG 7.62mm PKM Team P2	19	Machine gun team
Inf, Recon Team P2	26	Reconnaissance team
Inf, RPG Team P4	20	Rocket propelled grenade launcher
Inf, Sniper Team P2	30	
Inf, SPG9 Team P3	25	Recoilless rifle team
Inf, Squad P8	40	Standard inf squad
Inf, Team P2	10	Misc small units or irregulars
Inf, Team P6	27	Misc small units or irregulars
LUV, Motorcycle	5	
MCV, IMR2M Obstacle Clearing Veh	40	Tracked obstacle clearing vehicle
MCV, MTK2 Mine Clearing Vehicle	40	Tracked mine clearing vehicle
MLV, MTLB UMZ Mine Dispenser	200	Tracked mine laying vehicle
Mortar, 120mm P6	40	Dismounted mortar
Mortar, 82mm P5	30	Dismounted mortar
Mortar, Carrier 120mm VTT323	58	Tracked mortar carrier
Mortar, Carrier 82mm VTT323	53	Tracked mortar carrier
Mortar, SP 120mm 2S23	80	Wheeled mortar carrier
Mortar, SP 120mm 2S31	85	Tracked mortar carrier
Mortar, SP 120mm 2S9	85	Tracked mortar carrier
MRL, 122mm BM21	150	Wheeled multiple rocket launcher
MRL, 220mm 9P140	200	Wheeled multiple rocket launcher
OCV, IMR2 Obstacle Clearing Veh	12	Tracked obstacle clearing vehicle
Radar, Artillery Locating ARK1M	20	Tracked counter battery radar
Radar, Surveillance SNAR10	20	Tracked surveillance vehicle
RECV, BRM1K ACRV	50	Tracked artillery direction vehicle
RECV, BRM3K CRV	70	Tracked artillery direction vehicle
RV, BREM1 Recovery Vehicle	40	Heavy tracked recovery vehicle
SAM, 2S6 SP SAM/AAA	80	Tracked air defense system
SAM, SA10 Grumble	80	Wheeled SAM launcher
SAM, SA11 Gadfly	80	Tracked SAM launcher
SAM, SA13 Gopher	80	Tracked SAM launcher
SAM, SA14 Gremlin P1	22	Portable surface to air missile
SAM, SA15 Gauntlet	80	Tracked SAM launcher
SAM, SA16 Gimlet P1	24	Portable surface to air missile
SAM, SA18 Grouse P1	22	Portable surface to air missile
SAM, SA6 Gainful	80	Tracked SAM launcher
SAM, SA7 Grail P1	20	Portable surface to air missile
SAM, SA7B Grail P1	22	Portable surface to air missile
SAM, SA8B Gecko	80	Wheeled SAM launcher
SAM, SA9 Gaskin BRDM2	80	Wheeled SAM launcher
Tank, M84 + ATGM (Yug)	90	w ATGM capability

Tank, T55AMV + ATGM + ERA	70	w ATGM capability
Tank, T55M M1974	57	Main battle tank
Tank, T55M M1974+	60	modernized version
Tank, T62M M1975	62	Main battle tank
Tank, T62M M1975+	65	modernized version
Tank, T62MV + ATGM + ERA	75	w ATGM capability
Tank, T64BV + ATGM	80	w ATGM capability
Tank, T72BM/S + ATGM	80	w ATGM capability
Tank, T72M [IQ91]	70	Low capability export model used by Iraq in Desert Storm
Tank, T72M	80	Main battle tank
Tank, T80B + ATGM	90	w ATGM capability
Tank, T80U + ATGM	90	w ATGM capability
Tank, T80U	85	Main battle tank
Tank, T80UM1 + ATGM	90	w ATGM capability
Tank, T84 + ATGM (Ukraine)	90	w ATGM capability
Tank, T90S + ATGM	95	w ATGM capability
Tank, TFO	100	Future OPFOR Tank
Tank, Type 59 II	70	Main battle tank
Tank, Type 85 IIM	80	Main battle tank
Tank, Type 98	80	Main battle tank
Truck, Cargo .5mt	12	
Truck, Cargo 10mt	12	
Truck, Cargo 15mt	12	
Truck, Cargo 2mt	12	
Truck, Cargo 4mt	12	
Truck, Cargo 6mt	12	
Truck, Tank Transport 21mt	12	Tank transporter
Truck, UMZ Mine Dispenser	200	Wheeled mine dispensing vehicle
Truck, Van 4mt	12	
UAV	400	Unmanned aerial vehicle
VLB, MTU72 AVLB Bridging Vehicle	12	Tracked bridge laying vehicle

Appendix F - Unit Points Guide

By Mike Nankervis
[Updated by I.L. Holdridge]

This guide is a compilation of the Order of Battle lethality value totals given in the custom scenario templates for TacOps. It is designed as an aid to those players who enjoy setting up custom games. This guide lists all of the points totals for the larger formations contained in the various custom scenario templates: 1) US Army, 2) US Marine Corps, and 3) Canadian.

If you've always wanted to set up a custom scenario and needed a listing of the points totals for the various formations, i.e. US Army Mechanized Infantry Battalion, then you'll just love this. Remember, the lethality values are an "approximation" of usefulness for each and every type of unit in TacOps. They are by no means an exact value as the individual values are subject to change in later updates. What this tends to mean is, if you set up a scenario and give each side 20,000 points, the scenario STILL might not be balanced all that well.

Canadian Forces

Mechanized Infantry Brigade HQ: 949 Points

6 x M113 APC	1 x HQ Command
13 x HQ Ops Tm	8 x M577 Command Post
1 x Grizzly RBB	1 x M113 ARVL
1 x Truck LSVW Ambl	2 x Medic

Brigade Reconnaissance Squadron: 3106

5 x Coyote Cmd	6 x HQ Command [-]
2 x M577 Command Post	6 x HQ Ops Tm
5 x M113 APC	1 x Grizzly RBB
9 x Coyote Recce (T)	22 x Inf Tm w LMG
9 x Coyote Recce (M)	4 x Bison APC
10 x Eryx ATGM	4 x M113 E/PNR
4 x Inf Engineer Team	4 x M548 Ammo
2 x M548 POL	3 x M113 MRT
3 x HQ CSS Tm	1 x M113 ARVL
2 x M113 Ambulance	4 x Medic

Brigade Reconnaissance Squadron HQ: 1288

1 x Coyote Cmd	2 x HQ Command [-]
2 x M577 Command Post	6 x HQ Ops Tm
5 x M113 APC	1 x Grizzly RBB
4 x M113 E/PNR	4 x Inf Engineer Team
4 x Eryx ATGM	4 x M548 Ammo
2 x M548 POL	3 x M113 MRT
3 x HQ CSS Tm	1 x M113 ARVL
2 x M113 Ambulance	4 x Medic

Brigade Reconnaissance Troop: 626
- 1 x Coyote Cmd
- 3 x Coyote Recce (T)
- 3 x Coyote Recce (M)
- 2 x Eryx ATGM

- 1 x HQ Command [-]
- 8 x Inf Tm w LMG
- 2 x Bison APC

Brigade Air Defence Battery: 4008
- 33 x M113 APC
- 16 x HQ Ops Tm
- 1 x M113 ARVL
- 1 x HQ CSS Tm
- 2 x M113 Ambulance
- 16 x M113 w ADATS
- 18 x Javelin S15 SAM

- 1 x HQ Command [-]
- 2 x M577 Command Post
- 1 x M113 MRT
- 1 x M548 Cargo
- 4 x Medic
- 12 x M548 Ammo

Brigade Air Defence Battery HQ: 381
- 2 x M113 APC
- 3 x HQ Ops Tm
- 1 x M113 ARVL
- 1 x HQ CSS Tm
- 2 x M113 Ambulance

- 1 x HQ Command [-]
- 2 x M577 Command Post
- 1 x M113 MRT
- 1 x M548 Cargo
- 4 x Medic

ADATS Trp, Brigade Air Defence Battery: 550
- 2 x M113 APC
- 4 x M113 w ADATS

- 2 x HQ Ops Tm
- 3 x M548 Ammo

Javelin Trp, Brigade Air Defence Battery: 1427
- 23 x M113 APC
- 18 x Javelin S15 SAM

- 5 x HQ Ops Tm

Javelin Section, Brigade Air Defence Battery: 439
- 7 x M113 APC
- 6 x Javelin S15 SAM

- 1 x HQ Ops Tm

Armoured Regiment: 9251
- 10 x Leopard Cmd Tank
- 17 x HQ Ops Tm
- 1 x Grizzly RBB
- 5 x Taurus ARV
- 22 x Medic
- 1 x HQ Command [-]
- 8 x Inf Tm w LMG
- 8 x M548 Ammo
- 8 x M548 POL
- 4 x Leopard Dozer

- 15 x M113 APC
- 2 x M577 Command Post
- 1 x M113 ARVL
- 3 x Truck LSVW Ambl
- 1 x Coyote Cmd
- 8 x Coyote Recce (T)
- 64 x Leopard Tank
- 28 x HQ CSS Tm
- 12 x M113 MRT
- 8 x M113 Ambulance

Armoured Regiment HQ: 604
- 2 x Leopard Cmd Tank
- 5 x HQ Ops Tm
- 1 x Grizzly RBB
- 1 x Taurus ARV
- 3 x Medic

- 3 x M113 APC
- 2 x M577 Command Post
- 1 x M113 ARVL
- 3 x Truck LSVW Ambl

Reconnaissance Troop, Armoured Rgt: 580
- 1 x Coyote Cmd
- 8 x Coyote Recce (T)

- 1 x HQ Command [-]
- 8 x Inf Tm w LMG

Armoured Squadron : 2016
2 x Leopard Cmd Tank	16 x Leopard Tank
3 x M113 APC	3 x HQ Ops Tm
2 x M548 Ammo	7 x HQ CSS Tm
2 x M548 POL	3 x M113 MRT
1 x Leopard Dozer	1 x Taurus ARV
2 x M113 Ambulance	4 x Medic

Armoured Troop: 300
4 x Leopard Tank

Mechanized Infantry Battalion: 9590
75 x M113 APC	21 x HQ Command [-]
22 x HQ Ops Tm	6 x M577 Command Post
1 x Grizzly RBB	6 x M113 ARVL
8 x M113 Ambulance	16 x Medic
2 x Coyote Cmd	7 x M548 Cargo
11 x HQ CSS Tm	10 x Coyote Recce (T)
10 x Inf Tm w LMG	4 x Eryx ATGM
16 x 60mm Mortar	24 x Inf Section + Eryx
12 x Inf Team	8 x M548 Ammo
4 x M548 POL	12 x M113 TUA
2 x M113 FOO/MFC	2 x Inf FOO Team
8 x Bison Mortar Carrier	4 x M113 E/PNR
4 x Inf Engineer Team	

Mechanized Infantry Battalion HQ: 712
7 x M113 APC	1 x HQ Command [-]
9 x HQ Ops Tm	3 x M577 Command Post
1 x Grizzly RBB	2 x M113 ARVL
4 x M113 Ambulance	8 x Medic

Reconnaissance Platoon, Mechanized Infantry Bn: 885
1 x Coyote Cmd	1 x HQ Command [-]
1 x M577 Command Post	1 x HQ Ops Tm
2 x M548 Cargo	2 x HQ CSS Tm
10 x Coyote Recce (T)	10 x Inf Tm w LMG

Reconnaissance Section, Mechanized Infantry Bn: 130
2 x Coyote Recce (T)	2 x Inf Tm w LMG

Anti Armour Plt, Mechanized Infantry Bn: 950
1 x M113 APC	1 x HQ Command [-]
1 x M577 Command Post	1 x HQ Ops Tm
2 x M548 Cargo	2 x HQ CSS Tm
12 x M113 TUA	

Anti Armour Det, Mechanized Infantry Bn: 120
2 x M113 TUA

Mortar Platoon, Mechanized Infantry Bn: 984

1 x M577 Command Post	1 x HQ Command [-]
1 x Coyote Cmd	3 x HQ Ops Tm
2 x M113 FOO/MFC	2 x Inf FOO Team
3 x M548 Cargo	3 x HQ CSS Tm
2 x M113 APC	8 x Bison Mortar Carrier

Mortar Group, Mechanized Infantry Bn: 402

1 x M113 FOO/MFC	1 x Inf FOO Team
1 x M548 Cargo	1 x HQ CSS Tm
1 x M113 APC	1 x HQ Ops Tm
4 x Bison Mortar Carrier	

Pioneer Platoon, Mechanized Infantry Bn: 275

1 x M113 APC	1 x HQ Command [-]
4 x M113 E/PNR	4 x Inf Engineer Team

Mechanized Infantry Company: 1446

16 x M113 APC	4 x HQ Command [-]
2 x HQ Ops Tm	1 x Eryx ATGM
4 x 60mm Mortar	6 x Inf Section + Eryx
3 x Inf Team	1 x HQ CSS Tm
2 x M548 Ammo	1 x M548 POL
1 x M113 ARVL	1 x M113 Ambulance
2 x Medic	

Mechanized Infantry Platoon: 367

4 x M113 APC	1 x HQ Command [-]
1 x 60mm Mortar	3 x Inf Section + Eryx

Infantry Co Dismounted: 714

4 x HQ Command [-]	2 x HQ Ops Tm
1 x Eryx ATGM	4 x 60mm Mortar
9 x Inf Section + Eryx	2 x Medic

Close Support Medium Artillery Regiment: 11573

12 x M577 Command Post	33 x HQ Ops Tm
31 x M113 APC	3 x M113 CM Radar
1 x Grizzly RBB	20 x HQ CSS Tm
2 x M113 ARVL	10 x M113 MRT
6 x M113 Ambulance	12 x Medic
16 x M113 FOO/MFC	16 x Inf FOO Team
4 x M578 MRV	24 x M109 155mm SP Hwtzr
24 x	

Close Support Medium Artillery Regiment HQ: 1001

4 x M577 Command Post	5 x HQ Ops Tm
7 x M113 APC	3 x M113 CM Radar
1 x Grizzly RBB	8 x HQ CSS Tm
2 x M113 ARVL	2 x M113 MRT
2 x M113 Ambulance	4 x Medic

CS Battery, Close Support Medium Artillery Rgt: **2643**

  6 x M113 APC   7 x HQ Ops Tm
  4 x M113 FOO/MFC   4 x Inf FOO Team
  3 x HQ CSS Tm   2 x M113 MRT
  1 x M113 Ambulance   2 x Medic
  1 x M578 MRV   2 x M577 Command Post
  6 x M109 155mm SP Hwtzr   6 x M992 FAASV

CH146 Helicopter Squadron: 1920

  24 x CH146 Griffon Helo

CH146 Helicopter Flight: 640

  8 x CH146 Griffon Helo

US Army

Armored Cavalry Regiment: 26514 Points
    114 x M3 Bradley   114 x Inf Scout Team
    123 x M1A2 Tank   18 x M106 Mortar Carrier
    18 x M109 155mm SP Hwtzr

Armored Cavalry Troop, Armored Cavalry Rgt: **1976**
    12 x M3 Bradley   12 x Inf Scout Team
    9 x M1A2 Tank   2 x M106 Mortar Carrier

Combat Aviation Squadron: 13060
    1 x OH58 Kiowa Helo GP   18 x UH60 Blackhawk Helo
    26 x OH58 Kiowa Helo AT   26 x AH1 Cobra Helo

Air Cavalry Troop, Combat Aviation Squadron: **2120**
    6 x OH58 Kiowa Helo AT   4 x AH1 Cobra Helo

Attack Helo Co, Combat Aviation Squadron: 2540
    4 x OH58 Kiowa Helo GP   7 x AH1 Cobra Helo

HQ Troop, Combat Aviation Squadron: 1620
    1 x OH58 Kiowa Helo GP   18 x UH60 Blackhawk Helo

Airborne Inf Bn (Air Assault): 9418
    62 x UH60 Blackhawk Helo   12 x HMMWV + HMG
    27 x Inf Squad   18 x MG Team 7.62mm
    31 x HMMWV + LMG   6 x Javelin ATGM
    6 x 60mm Mortar   20 x HMMWV AT
    4 x CH47 Helo   4 x HMMWV Mortar Carrier
    4 x Stinger SAM

M125 81mm Mortar Platoon: 318
    6 x M125 Mortar Carrier

Mechanized Infantry Battalion: 8320
    8 x M3 Bradley   8 x Inf Scout Team
    52 x M2 Bradley   52 x Inf Team
    36 x Javelin ATGM   12 x M901 ITV
    4 x M113 APC   6 x M106 Mortar Carrier

Antiarmor Company, Mech Inf Bn: 880
    4 x M113 APC   12 x M901 ITV

Antiarmor Platoon, Mech Inf Bn: 220
    1 x M113 APC   3 x M901 ITV

M106 4.2" Mortar Platoon, Mech Inf Bn: 348
    6 x M106 Mortar Carrier

Mechanized Infantry Company: 1613
    13 x M2 Bradley   13 x Inf Team
    9 x Javelin ATGM

Mechanized Infantry Platoon: 506
    4 x M2 Bradley   4 x Inf Team
    3 x Javelin ATGM

Scout Platoon: 480
    6 x M3 Bradley   6 x Inf Scout Team

Armored Battalion: 6628
    58 x M1A2 Tank   6 x M3 Bradley
    6 x Inf Scout Team   6 x M106 Mortar Carrier

Tank Company: 1400
    14 x M1A2 Tank

Tank Platoon: 400
    4 x M1A2 Tank

M109 155mm SP Howtizer Battery: 1350
    6 x M109 155mm SP Hwtzr

Attack Helicopter Battalion: 9780
    1 x OH58 Kiowa Helo GP   3 x UH60 Blackhawk Helo
    12 x OH58 Kiowa Helo AT   18 x AH64 Apache Helo AT

Attack Helo Co, Attack Helo Bn: 3120
    4 x OH58 Kiowa Helo AT   6 x AH64 Apache Helo AT

AH64 Apache (AT) Helicopter Flight: 1600
    4 x AH64 Apache Helo AT

AH64 Apache (GP) Helicopter Flight: 1600
    4 x AH64 Apache Helo GP

AH1 Cobra Helicopter Flight: 1040
    4 x AH1 Cobra Helo

CH47 Helicopter Flight: 340
    4 x CH47 Helo

OH58 Kiowa (AT) Helicopter Flight: 720
    4 x OH58 Kiowa Helo AT

OH58 Kiowa (GP) Helicopter Flight: 720
    4 x OH58 Kiowa Helo GP

UH60 Blackhawk Helicopter Flight: 480
    6 x UH60 Blackhawk Helo

US Marine Corps

Rifle Battalion (+)(Helo): 7001 Points
20 x CH46 Helo
18 x SMAW Team
32 x Javelin ATGM
6 x Stinger SAM
9 x 60mm Mortar
8 x HMMWV AT
8 x 81mm Mortar

27 x Inf Squad
18 x MG Team 7.62mm
3 x HMMWV + HMG
8 x HMMWV + LMG
3 x HMMWV + MK19
8 x CH53 Helo

Rifle Battalion (+)(Mech): 5186
30 x AAVP7 APC
32 x Javelin ATGM
18 x SMAW Team
8 x HMMWV Mortar Carrier

27 x Inf Squad
18 x MG Team 7.62mm
9 x 60mm Mortar

Rifle Battalion: 3746
27 x Inf Squad
18 x MG Team 7.62mm
9 x 60mm Mortar

32 x Javelin ATGM
18 x SMAW Team
8 x HMMWV Mortar Carrier

Rifle Company: 743
10 x Inf Squad
6 x SMAW Team

6 x MG Team 7.62mm
3 x 60mm Mortar

Weapons Plt, Rifle Co: 333
6 x MG Team 7.62mm
3 x 60mm Mortar

6 x SMAW Team

Rifle Platoon: 123
3 x Inf Squad

Rifle Squad: 41
1 x Inf Squad

81mm Mortar Plt (Foot), Rifle Bn: 240
8 x 81mm Mortar

81mm Mortar Plt (HMMWV), Rifle Bn : 296
8 x HMMWV Mortar Carrier

Anti Armor Plt, Rifle Bn: 1344
32 x Javelin ATGM

Anti Armor Section, Rifle Bn: 336
8 x Javelin ATGM

Stinger Section: 112

4 x Stinger SAM

Stinger Section (HMMWV): 160
4 x HMMWV

4 x Stinger SAM

HMMWV 81mm Mortar Section: 74
2 x HMMWV Mortar Carrier

HMMWV Air Defense Section: 80
   2 x HMMWV Air Defense

HMMWV Anti Tank Section: 92
   2 x HMMWV AT

HMMWV Heavy Machine Gun Section: 64
   2 x HMMWV + HMG

HMMWV Light Machine Gun Section: 62
   2 x HMMWV + LMG

HMMWV Mk19 Section: 74
   2 x HMMWV + MK19

HMMWV Section: 24
   2 x HMMWV

AAV Company: 1584
   33 x AAVP7 APC

AAV Platoon: 480
   10 x AAVP7 APC

Anti Tank Company: 3312
   72 x HMMWV AT

Anti Tank Platoon: 1104
   24 x HMMWV AT

LAI Air Defense Platoon: 636
   12 x LAV-AD AFV

LAI Air Defense Section: 212
   4 x LAV-AD AFV

LAI Assault Gun Platoon: 477
   9 x LAV AG

LAI Assault Gun Section: 159
   3 x LAV AG

LAI Anti Tank Platoon: 1347
   5 x LAV25 IFV   5 x Inf Team
   16 x LAV AT AFV

LAI Anti Tank Section: 319
   1 x LAV25 IFV   1 x Inf Team
   4 x LAV AT AFV

LAI Battalion: 5392
   56 x LAV25 IFV   56 x Inf Team
   16 x LAV AT AFV   8 x LAV Mortar Carrier

LAI Company: 994
   14 x LAV25 IFV   14 x Inf Team

LAI Mortar Platoon: 566
    2 x LAV25 IFV   2 x Inf Team
    8 x LAV Mortar Carrier

LAI Mortar Section: 106
    2 x LAV Mortar Carrier

LAI Platoon: 284
    4 x LAV25 IFV   4 x Inf Team

LAI Squad: 71
    1 x LAV25 IFV   1 x Inf Team

LAI Weapons Company: 2126
    10 x LAV25 IFV   10 x Inf Team
    16 x LAV AT AFV   8 x LAV Mortar Carrier

Tank Battalion: 5504
    44 x M1A2 Tank   24 x HMMWV AT

Tank Company: 1400
    14 x M1A2 Tank

Tank Platoon: 400
    4 x M1A2 Tank

M109 155mm SP Howtizer Battery: 1350
    6 x M109 155mm SP Hwtzr

CH46 Helicopter Flight: 320
    4 x CH46 Helo

CH53 Helicopter Flight: 360
    4 x CH53 Helo

Cobra Helicopter Flight: 520
    2 x AH1 Cobra Helo

OPFOR

Motorized Rifle Regiment (BMP)(+): 21157 Points

8 x BRDM2 APC	17 x Inf Team
133 x BMP2 IFV	88 x Inf Squad
31 x T80U Tank	54 x PKM MG Team
18 x AGS17 Team	27 x SA16 SAM
18 x 2S 120mm SP Mortar	9 x BRDM2 AT
4 x ZSU-23-4 AAA	18 x 122mm SP Hwtzr

Motorized Rifle Battalion (BMP): 4811

43 x BMP2 IFV	4 x Inf Team
28 x Inf Squad	18 x PKM MG Team
6 x AGS17 Team	9 x SA16 SAM
6 x 2S 120mm SP Mortar	

Grenade Launcher Platoon, MR Bn (BMP): 240

3 x BMP2 IFV	3 x AGS17 Team

Air Defense Platoon, MR Bn (BMP): 381

3 x BMP2 IFV	9 x SA16 SAM

120mm Mortar Battery, MR Bn (BMP): 510

6 x 2S 120mm SP Mortar

Motorized Rifle Company (BMP): 1161

12 x BMP2 IFV	1 x Inf Team
9 x Inf Squad	6 x PKM MG Team

Motorized Rifle Company (BMP) MG Plt: 224

2 x BMP2 IFV	6 x PKM MG Team

Motorized Rifle Platoon (BMP): 285

3 x BMP2 IFV	3 x Inf Squad

Motorized Rifle Regiment (BTR)(+): 21265

8 x BRDM2 APC	17 x Inf Team
4 x BMP2 IFV	88 x Inf Squad
31 x T80U Tank	144 x BTR80 APC
27 x PKM MG Team	18 x AGS17 Team
27 x AT7 ATGM Saxhorn	12 x AT4 ATGM Spigot
27 x SA16 SAM	18 x 2S23 120mm SP Mortar
6 x SPG9 Team	9 x BRDM2 AT
4 x ZSU-23-4 AAA	18 x 122mm SP Hwtzr

Motorized Rifle Battalion (BTR): 4820

48 x BTR80 APC	3 x Inf Team
28 x Inf Squad	9 x PKM MG Team
6 x AGS17 Team	9 x AT7 ATGM Saxhorn
4 x AT4 ATGM Spigot	9 x SA16 SAM
2 x SPG9 Team	6 x 2S23 120mm SP Mortar

Anti Tank Platoon, MR Bn (BTR): 429

5 x BTR80 APC	4 x AT4 ATGM Spigot
2 x SPG9 Team	

Grenade Launcher Platoon, MR Bn (BTR): 279
3 x BTR80 APC   6 x AGS17 Team

Air Defense Platoon, MR Bn (BTR): 345
3 x BTR80 APC   9 x SA16 SAM

120mm Mortar Battery, MR Bn (BTR): 480
6 x 2S23 120mm SP Mortar

Motorized Rifle Company (BTR): 1068
12 x BTR80 APC   1 x Inf Team
9 x Inf Squad   3 x PKM MG Team
3 x AT7 ATGM Saxhorn

Motorized Rifle Platoon (BTR): 249
3 x BTR80 APC   3 x Inf Squad

Machine Gun/Anti Tank Platoon , MR Co (BTR):   251
2 x BTR80 APC   3 x AT7 ATGM Saxhorn
3 x PKM MG Team

Reconnaissance Company , MR Rgt: 568
4 x BMP2 IFV   8 x Inf Team
4 x BRDM2 APC

Anti Tank Battery, MR Rgt: 690
4 x BRDM2 APC   4 x Inf Team
9 x BRDM2 AT

Anti Tank Platoon, MR Rgt: 210
1 x BRDM2 APC   1 x Inf Team
3 x BRDM2 AT

ZSU 23-4 Air Defense Battery: 160
4 x ZSU-23-4 AAA

ZU 23-2 Air Defense Battery: 216
8 x ZU23

Tank Battalion: 2635
31 x T80U Tank

Tank Company: 850
10 x T80U Tank

Tank Platoon: 255
3 x T80U Tank

122mm SP Howitzer Battalion: 2700
18 x 122mm SP Hwtzr

122mm SP Howitzer Battery: 900
6 x 122mm SP Hwtzr

152mm SP Howitzer Battalion: 4050
18 x 152mm SP Hwtzr

152mm SP Howitzer Battery: 1350
    6 x 152mm SP Hwtzr

Havoc Helicopter Flight: 700
    2 x Mi28 Havoc Helo

Hind Helicopter Flight: 600
    2 x Mi24 Hind Helo

Appendix G – Special Units, Special Capabilities

1 Tank With Attachment

Any tank may be outfitted with an excavation blade, or a mine plow, or a mine roller. A tank with any one of these attachments can be used to breach minefields. A tank with excavation blade or mine plow can breach some obstacles.

Use the **Options/Add One Unit** menu item to add and place on the map one of the following items: Attachment Blade, or Attachment Mine Plow, or Attachment Mine Roller. Close the **Add One Unit Window**. Click on the attachment marker that is now on the map. A window should appear with a button labeled "Install this item on a tank". Click on this button and then click on a single vehicle, tank marker. The marker for the attachment should then disappear. The tank marker should change to include an item on the front of the tank hull that is meant to represent the attachment. A sideways 'U" is a blade, a sideways "fork" is a mine plow, and a black circle is a mine roller. If the largest symbol size is being used an "E" (for engineer) will also be added to the tank marker.

The mine roller attachment works by detonating mines as it travels. It breaches faster than a mine plow or blade and is less susceptible to damage. However, there is still some chance that the roller will be damaged as it does its job. If the roller is damaged the tank will automatically halt awaiting new orders and the roller marking will be removed from its icon.

The mine plow attachment works by shoveling mines aside. It is slower than the mine roller. There is a chance that it will detonate some mines but it is reasonably resistant to damage. If the plow is damaged the tank will automatically halt awaiting new orders and the mine plow marking will be removed from its icon.

The blade attachment also works by shoveling mines aside. It is slower than the mine plow, is more likely to detonate a mine, and is more likely to be damaged. If the blade is damaged the tank will automatically halt awaiting new orders and the blade marking will be removed from its icon.

2 Mine Dispenser

The following units can automatically lay minefields in response to an orders button in the **Unit Orders Window**: US M548 with Volcano mine dispenser, US 5 ton truck w Volcano mine dispenser, US UH60 helicopter with Volcano mine dispenser, and OPFOR MTLB with UMZ mine dispenser, OPFOR 5 ton truck w Volcano mine dispenser, and OPFOR HIP helicopter with UMZ mine dispenser.

Each unit lays minefields in 110x110 meter segments. Each unit can lay a maximum of ten of these segments. Each dispensed minefield will have a two to three minute delay before arming and will self destruct after a designated period of time.

3 Vehicle Launched Bridge

A vehicle launched bridge can overcome some water terrain and some man made obstacles. The following units can automatically deploy or recover a vehicle launched bridge in response to an orders button in the **Unit Orders Window**: US M60 AVLB, US M1 Heavy Assault Bridge, and OPFOR MTU72 Vehicle Launched Bridge.

4 Explosive Line Charge

An explosive line charge can help breach a minefield or a wire obstacle The following units can launch an explosive line charge (ELC) in response to an orders button in the **Unit Orders Window**: US M60 AVLM (2 lines), USA HMMWV with MICLIC trailer (1 line), US AAVP7 with Mark154 LMC (3 LINES), OPFOR MTK2 Mine Clearing Vehicle (2 lines), and OPFOR IMR2 Obstacle Clearing Vehicle (2 lines).

To use an ELC the player opens a unit orders window for an ELC equipped unit, then gives movement orders to move the unit adjacent to the minefield or wire obstacle. The player then clicks on the "Launch Line Charge" button. The program will ask the player to select a target by clicking on a minefield marker or a wire obstacle marker. In a following combat/movement phase the unit will automatically move to the minefield or obstacle and launch its line charge.

When an ELC is fired at an obstacle that consists of wire only, the obstacle's countermobility effect will be reduced by a random 30 to 100 percent. If an ELC is fired at a combination obstacle consisting of wire and barricade or wire and ditch then the obstacle's countermobility effect versus dismounted personnel will be reduced by a random 30 to 50 percent but the obstacle's effects on tracked and wheeled vehicles will not change. The player can learn the exact effect of the firing on the obstacle by right clicking on the obstacle marker and selecting "Info" from the unit popup menu. [Or by holding down the Ctrl key and clicking on the obstacle marker.]

When an ELC is fired at a minefield, an abstracted path will be created through the center of the minefield that is 5 pixels wide (50 meters). This path is intentionally about five times wider than it should be. The path is oversized in the game because if the marked path was narrower then the player would not be able to easily see it and would not be able to reliably click on it when he later needed to give movement orders to units to follow the path. This path is not guaranteed to be free of mines. An ELC will clear a random 75 to 100 per cent of the active mines along the path. The actual level of clearance will not be revealed to the player. If more certainty is desired by the player then he will need to fire a second line charge and or proof the path by pushing a blade, mine plow, or roller vehicle across it.

5 Engineers

Minefield breaching and obstacle breaching will generally be done faster, better, and or with less risk if done by an engineer unit or with dedicated engineering equipment.

6 Smoke Generator

The M58 Smoke Generator vehicle can lay a line of smoke in response to orders given with the **Unit Orders Window.** The M58 is first given a movement order to move to a map point. The player then clicks on the SG (smoke grenade) button to order the M58 to generate smoke. This sequence is repeated to lay a line of smoke behind a moving M58. Each segment of the smoke produced by the M58 will last for seven to eight minutes.

The TacOps M58 abstraction is unrealistic in the following ways. A TacOps M58 can produce an unlimited amount of smoke - a real M58 can produce 90 minutes of smoke. Due to the absence of wind in the TacOps model, this abstraction can not represent the important real world ability of this vehicle to remain stationary in a hidden position while generating smoke that can drift downwind into a useful line.

7 Logistics Package

A transportable, user defined, Logistics Package marker can be added to a scenario by using the **Options/Add One** Unit menu item. The Logistics Package marker can be used to resupply any unit that is located within 200 meters.

The **Unit Supply Window** is used to access the supply points that are in a Logistics Package. To open the **Unit Supply Window** click on the **Supply** button in the **Unit Orders Window**. When the **Supply Window** appears, check mark the **Logistics Package** box. You will then be asked to select a Logistics Package marker from the map that is located within 200 meters of the unit. If the resupply is successful, the logistics marker will be reduced by the number of points taken by the unit. If a logistics marker is reduced to zero supply points it will be automatically deleted. Logistics Package markers can be destroyed by enemy direct and indirect fire.

Appendix H - Play By Email Helps And Hints

Play By Email (PBEM) Helps and Hints

By Mike Nankervis

If you have never played a PBEM game of TacOps, then you've never really played TacOps at all. PBEM is the second best way to play the game, a face to-face network game is best of all. I've gathered some hints, helps, or gripes from other PBEM players so the following are not all my own original ideas.

1) If you still don't quite have the ability to get around the various commands for a PBEM game, check out the archived TacOps Folder messages on AOL. If you have this Guide, you SHOULD have access to the archived messages. Major Holdridge has given specific instructions as to how one begins a PBEM game. It's a little lengthy, so I'll not duplicate his work here. Go ahead and download the archives and read them thoroughly, you'll become a better player for the effort.

2) After having started a PBEM game one should organize the saved game files and order files in such a way as to not get them mixed up. An opponent can do nothing with your Saved Game file....he (or she) will need the PBM orders. It has been suggested that one should create a folder for each set of orders sent. For example, you are sending the orders files for turns 23 and 24. On the desktop go to the FILE menu and select NEW Folder (or COMMAND-N). When the folder appears, name it appropriately. Personally, I do it this way," Turns 23&24 to (name of opponent)". This way, when you send the folder via AOL (or another on-line service) you'll know exactly what is being sent each time. Also, you may wish to create a folder, within the TacOps file folder, and name it something like "PBEM games". You'll then create new folders for each PBEM game you become involved in and, as a result, you'll have less clutter in your TacOps file folder or the Scenarios folder.

3) Several of the "grognards" (which is French for "grumblers") have created custom folder icons. The icons are easily used to differentiate between the various folders. At a glance, you can find a specific folder instead of searching for it within the maze of "other" generic folder icons.

4) As a matter of courtesy to one's opponent. If you know you'll be unable to send orders for a lengthy period of time...say 3 days to over a week...then it is suggested that you inform your opponent as to that fact. It becomes a little costly to vainly check your AOL account several times a day hoping for the "you've got mail" message.

5) When playing a PBEM game it becomes necessary to either have great memory or to keep a paper copy of what is occurring in the game. During the course of a game, you'll often spot enemy units for only a brief period of time. If you want to direct artillery fire on certain of these units, but you just can't reach them with SHIFT FIRE and you don't want to CEASE FIRE and lose accuracy you'll need to remember exactly where those bad guys are. The maps used in TacOps have each been reduced to printable files and are available via AOL. It is highly

recommended that you download them and print them out when needed. They can very helpful for marking the positions of enemy units as well as the allocation of fire support.

6) If you just can't use #5 due to 1) no printer or 2) you are too lazy (like me) to keep a paper copy around, then try this method. By keeping an artillery unit available for a mission at all times one can generate ON MAP position markers. You can create Target Reference Points (TRPs) on the exact spot where an enemy marker is located. Since your unit doesn't have a fire mission, you'll not lose out on hitting anything. All you need to do is create a TRP where you want and then CEASE FIRE. I generally use my off map supporting artillery as it can reach the entire map. However, if your supporting arty have all been assigned missions, you can use Self Propelled Howitzers (the best as they can reach the whole map too) or Mortars (limited in usefulness by short range). Just try this out...it works.

7) Make sure you double check your orders before SENDING the orders. It can be quite maddening to place an ICM shot which has a 1 second TOT (Time on Target) right on a marker of 14 BMPs (or Bradleys) and forget to change the artillery from ADJUST to FIRE FOR EFFECT. Also, remember to NOT waste on map artillery rounds. An artillery unit will fire an adjusting round until an accuracy of 5 is reached, after that, no more rounds will impact on the screen, but you'll still be expending the rounds. On map artillery rounds are expensive to resupply so, SHIFT it or CEASE it.

Appendix I - Classroom Usage

Graphic Aid

An instructor can use TacOps to create graphics to support a tactical lecture. Any TacOps screen display can be captured as a paint file for use in creating slides or transparencies.

[Windows] One technique to accomplish this is to press the Print Screen key while holding down the Alt key. This will capture the current screen display and store it in the Windows clipboard - ready for pasting into a paint program such as Microsoft Paint (which is generally present in the Windows95/98 Accessories Program Menu). Alternately, a third party screen capture utility could be used.

[Macintosh] One technique to accomplish this is to press the 3 key while holding down the Shift Key and the Command key. This will capture the current screen display and store it in the system clipboard - ready for pasting into a paint program. Another technique is to press the 4 key while holding down the Shift Key and the Command key. This will allow you to select a precise area of the screen before the capture occurs. Alternately, a third party screen capture utility could be used.

An instructor could also set up a tactical situation and save it as a saved game file or as a sequence of saved game files for later recall and display with a computer projection screen system.

Tactical Homework

An instructor can prepare a tactical problem and issue saved game file copies of it for study or solution by students after class. A saved game file is marked as an instructor prepared file if the first character of the US/CA/blue force password is an asterisk (*). If the instructor wishes to insure that the students can not change the problem's fog-or-war setting or order of battle, then before he saves the file he should create a password that begins with an asterisk (*) - use the Options/Change Password menu item. Do not give this password to the students. Such a file can be loaded and played by a student without the instructor's password, but without the password all options relating to altering the game situation will be disabled.

Classroom Exercise

An instructor can prepare a tactical problem for team study and solution by students during class. One approach would be for the instructor to use TacOps to display a tactical situation and then call for a solution from the students. The instructor could then enter unit orders into TacOps that reflect the first stage of the student's plan and run one or more combat turns to develop the situation farther. The students could then be queried for appropriate reactions to the unfolding game events. This cycle of collecting student input, translating their input into unit orders, and running combat turns could be repeated indefinitely. Alternately, a classroom exercise could take the form of an umpire moderated mini-CPX (Command Post Exercise). See also **Appendix**

J - Command Post Exercise Guide and **Appendix K - Multiplayer Teams Network Mode**
for more information on CPX techniques.

Appendix J - Command Post Exercise Guide

1. Introduction

Note: This Appendix was written before the addition of the **Multiplayer Teams Network** mode of play. It describes a CPX that uses only one computer or two computers in **Two Players – Network** mode. However, much of this information is also applicable to a CPX that uses more than two computers. See **Appendix K - Multiplayer Teams Network Mode** for additional information on using that mode to conduct a CPX**.**

TacOps can be used to conduct a variety of styles of Command Post Exercise (CPX). A CPX is a military style exercise in which a small control group (also known as umpires) generates events and decides combat results for a large player group. The control group usually uses a combination of computers and paper maps to administer the exercise. The player group may be working with only paper maps or they may be linked to the control group by networked computers. Depending on the style of the CPX, the control group may run the enemy force (the usual case) or there may be a player group for the friendly force and a player group for the enemy force. The latter style is often called a Force on Force CPX.

The complexity of a TacOps CPX can vary from a single person acting as the control group for a few players located in one room (or spread across the Internet) up to a multi-battalion exercise with multiple control groups and multiple remotely located operations centers using real world communications equipment and networked computers. Below is a description of one possible approach to a moderately complex TacOps CPX - scale it up or down according to your resources and exercise goals.

2. Military Or Game Club CPX

2.1 Requirements

Two large player teams (one for the friendly force and one for OPFOR), two small control teams (one for the friendly force and one for OPFOR), four or more rooms, and two or more computers connected by a LAN style network. Each of the teams is located in a different room (Command Post). If you only have access to one very, very large room you could accomplish the same thing by putting the teams in different areas. The objectives of separation are for no team to be able to easily overhear the conversations of any other team and for the player teams to be unable to micro manage their control team.

2.2 Preparation for the CPX

Either create a custom scenario or use any of the existing scenarios.

Using a printable version of a TacOps map create a paper copy for each player team to use in its Command Post. Print the map at 175% to 300% so there is plenty of room for marking it with grease pens or transparency pens, tape the paper map pieces together, and either mount the finished paper map under hard plastic (poster frames are good for this) or laminate it with

adhesive coated clear plastic film (a cheap roll of clear plastic "shelf liner style contact plastic" will do fine). Also print or Xerox a large stack of maps done at a reduced size so that the whole map fits on one sheet of paper. These miniature maps can prove very useful for facilitating communications between the command teams and the control teams.

2.3 Conduct of the CPX

Battle and maneuver are resolved on the two control team computers but they are planned and directed with paper maps and verbal or written orders. Player teams never look at the control team computer screens. Player team members follow the battle by translating reports from the control team into plots on the player team's paper map (situation map). Opposing control teams may or may not look at each other's screens - it depends on how the exercise is run. Player teams send verbal or written orders to their control team on what they want to be done in the next few turns. Instructions to the control team are given as brief, realistic field orders and fire support requests, not as detailed "this tank will shoot at that tank" game play talk. The control teams then uses their best judgment to enter orders into the TacOps game engine to fit the intent of the player teams and they then run one or more combat phases. Battle reports, summaries, and situation reports are then sent from the control teams to the player teams verbally by radio, land line, or intercom, and/or by short paper messages. The control team might also provide reports graphically using one page miniatures of the battle map or by passing clear plastic overlays of a large situation map. Similarly a player team might communicate its intent to the control team by sketching instructions on a one page miniature of the battle map or passing an overlay. The basic idea is for the control teams to receive instructions and for them to report the game movement and battle action in a realistic, highly abbreviated way. The player teams do not give detailed instructions to the control teams and they do not get detailed, blow by blow battle reports.

The more people you have available, the more realism you can have in the exercise. In a perfect setup, each control team would have at least two or three members. One person to sit at the computer and one or more people to act as battle observers and communicators between the computer operator and the player teams. The communicators might sometimes act as small units reporting in or taking orders from the player group or they might sometimes act as headquarters personnel higher than the player group.

In a perfect setup, each player team would have a command element and one or more subordinate maneuver elements with a separate room for each.   The command element would consist of a Commanding Officer (CO), an Intelligence Officer (S2), an Operations Officer (S3), a Fire Support Coordination Officer (FSO), and several communicators, or clerks, or S shop assistants. The CO processes the big picture and provides intent. The S2 maintains the enemy OOB plot on the situation map and advises the CO on enemy capabilities. The S3 maintains the friendly situation plot on the situation map, advises the CO on friendly capabilities, and helps the CO communicate with subordinate elements (if any) and with the control team. The Fire Support Coordination Officer tracks the on map and off map artillery situation, advises the CO on fire support matters, and coordinates artillery support with subordinate elements (if any) and with the control team. If subordinate maneuver elements are participating in the CPX, they would typically represent company level commanders but in a large scale exercise they might be battalion level command elements with yet another level of players underneath.

For maximum realism, limit the amount of time allowed for the control teams to enter orders and to start each combat phase. Use a cheap chess timer at each computer. At the end of each combat phase each control team starts its timer. Set the timer for at least five minutes per one minute game turn until everybody gets in the spirit of things. Work toward getting the timer down to one or two minutes for a very realistic exercise. Allowing only one or two minutes of administration for each combat turn will in effect turn the exercise into virtually a real time affair and can only be done if lots of people are involved as communicators.

Caution for club gamers: do not use a timer if there are people playing who can not handle being yelled at once in a while. Use of timed turns will absolutely introduce stress into the game - people may start living their roles - you need to decide up front if this is really the kind of gaming experience that you want your group to have. If you use a timer, you might consider having at least one ten minute admin break per hour during which all player team personnel must leave their Command Post. Also, if a timer is used then you may need to double or triple the game length setting for victory adjudication because you will start to see the player groups falling behind the action curve (just as they do in real life) and map movement and firefights will start to slow down (just as they do in real life).

2.4 CPX Variants

The following are concepts that can be applied to scale the complexity of a CPX up or down.

Use two control groups with each having a computer running TacOps and linked by a computer local area network (LAN). The enemy force has a control group and the friendly force has a control group.

Use only one control group and only one computer running TacOps. Only the enemy force has a control group. This one control group controls the enemy force as well as administering the exercise.

Have the control group administer the exercise and also act as the subordinate maneuver elements for a player command element.

Have player command elements and separate player maneuver elements.

Have the player command element also act as the player maneuver element.

Locate controllers and players in one large room such as a gym.

Locate controllers and players in separate rooms or separate buildings linked by intercom, telephone, radio, and or computer local area network.

Locate controllers and players in separate locations around the world linked by the Internet - through email and or Internet Relay Chat (IRC).

Use the new multiplayer teams network mode.

3. CPX Support Features

The TacOps game engine provides a number of features to facilitate the controller's job in a CPX. Most of these features can be described as either controls or reports. Controls enable the umpire to instantly change the game situation at any time. Reports provide the controller with a means to rapidly compile and pass situational information to the players. Most of these controls and reports are accessed via the **Options** or **Reports** menus.

Important. Some of these controls and reports are only available when the game has been set to CPX Umpire mode by check marking the **Options/Enable Umpire Tools** menu item. If something does not work as described below then you made need to first check mark the **Options/ Enable Umpire Tools** menu item.

3.1 Controls

There are two type of umpire controls - keyboard and menu.

3.2 Keyboard Controls

The umpire can instantly reposition a unit marker during any orders phase. Hold down the shift key, click on a unit marker, and then click on the map at the desired new location. The unit marker will be instantly repositioned at the new location.

3.3 Menu Controls

In a normal TacOps game session most of the items in the Options menu are only available during the first or setup turn of a game. In a TacOps CPX Umpire Mode game session, every menu item in the Options menu is available throughout a game - but still only during orders phases.

An umpire can use **Options** menu items to do the following activities during any orders phase.

    Add one or more units.
    Add or delete air support.
    Add or delete artillery support units and ammunition.
    Change entry times for off map units (if there are any).
    Change exit percentage goals (not usually applicable to CPX games).
    Change game length (not usually applicable to CPX games).
    Change supply availability.
    Change units and weapons.
    Delete units.
    Kill units.
    Add or delete entrenchments, minefields, obstacles, bridges, and helicopter landing zones.
    Add or delete smoke.

Damage vehicles.
Repair vehicles.

When a unit is 'deleted' by the umpire it is removed from game play as if it had never existed. A 'deleted' unit will not produce attrition points nor will it show up in reports as an eliminated unit.

When a unit is 'killed' by the umpire it is removed from play as if it had been eliminated through combat action. A 'killed' unit produces attrition points and it will show up in reports as an eliminated unit.

Entrenchments, minefields, obstacles, bridges, and helicopter landing zones are added by using the **Options/Engineering** menu item. During the orders phase of their addition some of these items are initially displayed as unit markers and they may be repositioned in the same manner as unit markers (i.e. hold down shift key, click on marker, click on map point for new location). Others can not be repositioned and must be deleted and readded. At the beginning of the combat phase after addition, all of these markers will be permanently converted to terrain features and none can then be handled as if they were unit markers.

3.4 Reports

Additional reports are available in the Reports menu when using CPX Umpire Mode. If archiving, printing, or additional editing is desired each report can be saved to disk as a plain text file or it can be copied to the system clipboard for pasting into another application. Reports can be simply passed as text to the players or they can be used as briefing scripts for verbal transmissions. Reports might also be archived for use in reconstructing game events for a post exercise review.

Situation Report. Reports the name, type, size, direction of movement if moving, damage, and map coordinate location for all friendly units for the phasing color. The "phasing color" is determined by which force color is currently check marked as being able to give unit orders in the **Orders** menu list.

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┌──────────────────────────────────────────────────────────┐
│ □ ══════ Situation Report – Blue 0700 ══════ □            │
│ ┌──────────────────────────────────────────────────┐ ▲   │
│ │ Situation Report – Blue 0700                     │ ▓   │
│ │ [A Co, 1st Plt], 4xTank, M1A1D, ID:1, UTM:038052 │ ▓   │
│ │ [B Co 1st Plt], 3xAPC, LAV25 IFV, ID:2, UTM:040051│     │
│ │    [B Co 1st Plt], 1xInf, Team, ID:3             │     │
│ │    [B Co 1st Plt], 1xInf, Team, ID:4             │     │
│ │    [B Co 1st Plt], 1xInf, Team, ID:5             │     │
│ │ [B Co, 2d plt], 3xAPC, AAVP7, ID:6, UTM:037051   │     │
│ │    [B Co, 2d plt], 3xInf, Squad, ID:7            │     │
│ │    [B Co, 2d plt], 2xInf, MG 7.62mm Team, ID:8   │     │
│ │    [B Co, 2d plt], 2xInf, SMAW Team, ID:9        │     │
│ │    [B Co, 2d plt], 3xATGM, Javelin Team, ID:10   │ ▼   │
│ └──────────────────────────────────────────────────┘     │
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Spot Report. Reports the type, size, direction of movement if moving, and map coordinate location for any enemy unit that was spotted at any time during the previous combat phase. The location reported is the position of the unit when it was last spotted. The unit may or may not still be at that location.

Support Report. Reports the status of available artillery and air support. The following info is provided for off-map and on-map artillery and mortar units: ammunition on hand, current firing status, map coordinates of current target, ammunition being fired at current target, accuracy of current firing, and the next time on target for current firing. The following info is provided for air support: current sortie availability, current mission status, minutes to current target, and the map coordinates of the current target.

TRP Report. Reports all friendly artillery and mortar Target Reference Points. The following information is provided for each TRP: TRP map coordinates and TRP accuracy.

Logistics Report. Reports the ammunition status of all friendly units.

3.5 Umpire Mode Startup for a Two Computer CPX

On both computers - simultaneously...

Start the TacOps program.

When the **Startup Window** appears, select the **Two Players - Network** button.

Select the **Options/ Enable Umpire Tools** menu item. This will activate all special CPX controls and reports and it will automatically activate the **Options/Ignore Unit Setup Limits** menu item.

Setup friendly forces according to the exercise plan.

If you are doing an umpire activity that involves Blue/friendly units then you should generally do those activities only the Blue/friendly forces computer. If you are doing an umpire activity that involves OPFOR units then you should generally do those activities on the Red computer. For example, if you need to add or delete an OPFOR unit then you must do that on the Red computer. Adding or deleting an OPFOR unit on the Blue computer may initially appear to work but the action will be ignored or undone when the next combat phase begins.

3.6 Umpire Mode Startup for a One Computer CPX

Start the TacOps program.

When the **Startup Window** appears, select the **Two Player** button. (It is possible to use many of the umpire support features in **Solitaire** mode but the umpire will have little if any influence over what the automated computer opponent (AI) does.)

Check mark the **Options/ Enable Umpire Tools** menu item. This will activate all special CPX controls and reports and it will automatically activate the **Options/Ignore Unit Setup Limits** menu item.

Select the **Options/Change Fog Of War** menu item and set friendly fog-of-war to **Units shown on enemy screen at all times**. This is necessary in order for the umpire to be able to see all friendly units during later orders phases and combat phases.

Setup the friendly forces according to the exercise plan.

Unselect the **Orders/Do Blue Unit Orders** menu item. This will automatically advance the game to the OPFOR forces setup phase.

Select the **Options/Change Fog Of War** menu item and set OPFOR fog-of-war to **Units shown on enemy screen at all times**. This is necessary in order for the umpire to be able to see all OPFOR units during later orders phases and combat phases.

Setup the OPFOR forces according to the exercise plan.

From this point on you would do additional setup and umpire activities for friendly forces and for OPFOR by alternately selecting between the **Orders/Do Blue Unit Orders** menu item and the **Orders/Do Red Unit Orders** menu item. In general, if you are doing an umpire activity for Blue/friendly forces then you should have first selected the **Orders/Do Blue Unit Orders** menu item. If you are doing an umpire activity for OPFOR then you should have first selected the **Orders/Do Red Unit Orders** menu item.

Appendix K - Multiplayer Teams Network Mode

1. Contents.

Summary.
Player Identification Number (PIN).
Game startup instructions for the Umpire.
Game startup instructions for Players.
Network Menu Items.
Miscellaneous Notes.

2. Summary.

Note: Additional useful information on CPX organization and umpire techniques can be found in **Appendix I - Command Post Exercise Guide**.

The multiplayer teams mode (MTM) of play allows more than two players to participate in the same game via the Internet or a LAN. The technical limit on the number of players is 200. The practical limit for Internet play is around 10 players. The practical limit for LAN play is an unknown number significantly greater than 20. At the time of this writing, 20 players on a LAN was the largest group that had been tried.

One participant must serve as a neutral umpire. The umpire must be the network host. The umpire can not usually be a game player because he has perfect situational awareness - the normal fog of war rules do not apply to the umpire.

The Multiplayer Teams mode was designed primarily for use by military professionals during the conduct of a Command Post Exercise (CPX). The setup and administration of a multiplayer teams game is more complex than the other modes of play and requires at least one exercise umpire.

An MTM game requires one umpire and two or more players. The umpire "hosts" the game on a dedicated exercise control computer. The players "join" the game via networked player computers. The umpire starts the game in host mode, creates and sets up all unit markers for all players on the umpire computer, and designates the ownership of each marker by assigning it a player identification number (PIN). As players join the game session, they will each be assigned a unique PIN which matches the PIN that has been assigned to their unit markers. Later each player will a receive the unit markers that carry his PIN from the umpire via a situation update. Immediately after the initial situation update, the players may or may not be able to change the starting position of their unit markers. After the issuance of the initial situation update, game play proceeds like any other TacOps mode with alternating orders and movement/combat phases.

The general flow of a typical MTM game turn is as follows. A turn consists of a simultaneous orders phase followed by a simultaneous movement and combat phase. During the orders phase, each player gives orders to the units, off map arty elements, and or air support sorties that he

controls. When a player has finished giving orders he selects the **Combat/Begin Combat** menu item. This causes his computer to automatically send a ready signal to the umpire computer. Once the umpire has received a ready signal from every player, the umpire computer will automatically begin to obtain orders from all players. Once all orders have been received, the umpire computer will automatically combine them into an orders update and then transmit it back to all players. Once all players have received the orders update, the movement and combat phase will automatically start on their computers and on the umpire computer. Movement and combat will then be displayed more or less simultaneously on all computers. Players can not issue new orders to their units until the movement and combat phase has finished on all player computers. The menus on all player computers will be disabled until the last computer reports that it has finished the movement and combat phase. If the exercise network contains computers of varying capabilities, the older and slower computers will likely take significantly longer to complete the display of the movement and combat phase. When the movement and combat phase is completed on each computer, another ready signal is automatically sent to the umpire computer. Once the umpire computer senses that the movement and combat phase has been completed on all player computers, it will automatically authorize all players to begin a new orders phase by sending a signal to their computers that re-enables their menus. This cycle is then repeated for the duration of the exercise. The umpire has the option to alter this cycle somewhat. The umpire can use the **Combat/Begin Combat w Options** menu item to (1) force the immediate start and display of a movement and combat phase on all computers with or without first collecting orders from the players or (2) to start and display one or more movement and combat phases on just the umpire computer followed by the manual transmission of a situation update to all players.

3. Player Identification Number (PIN).

The ownership or command of game items (unit markers, off map arty elements, and air support sorties) is controlled by the assignment of a unique Player Identification Number (PIN) to each player and to each item. A player can not use or give orders to an item unless it carries his PIN. When a scenario is first loaded on the umpire computer all game items have a PIN of zero – all items at this time belong to the umpire.

The umpire's PIN is always zero. The umpire must assign a unique PIN from 1 to 200 to each player. The umpire must also assign a PIN to each game item to indicate which player can control which item. A player can only control items of his same force color. Do not assign the same player PIN to items of different colors. The umpire PIN of zero can be assigned to items of different colors. Any unit marker, off map arty element, or air sortie - of any color - with a PIN of zero belongs to the umpire.

The umpire can transfer ownership of a unit marker from one player to another, within the same force color, at any time during a game. The umpire does this by changing the PIN assigned to the unit's marker. The umpire must then immediately send a situation update to all players in order for the change to actually take effect. Note that sending a situation update to all players will undo any new orders that they have given during the current orders phase. Therefore if units need to be reassigned, it is best to do so at the beginning of an orders phase before the players have begun giving new orders to their units.

The umpire normally uses items from the **Network** menu list to assign PINs to unit markers, off map arty elements, and air support sorties. The following menu items in the Network menu list can be used to set or change item PINs. It is important to remember that PIN changes will not appear on any computer other than the umpire computer until a situation update is sent to all players.

Network/Change PIN Listed Units. This menu item produces a listing of all unit markers of a given color - for example all Blue markers. The listing shows the current PIN of each listed marker. To change the PIN for any listed item, double click on that item in the list. A small window will then appear into which can be typed a new PIN for that unit. The umpire may also use this window to assign a text name to that unit.

Shortcut. If the "**C**" key is touched while an item in the list is selected, the PIN for that item will be copied to memory. If the "**V**" key is touched while an item in the list is selected, the last PIN to be copied into memory will be pasted into that item.

Network/Change PIN Selected Units. This menu item leads to a window which allows the assignment of a PIN to a group of selected unit markers. The group of markers can have been drag selected prior to the opening of this window or the group can be selected after the window is opened by clicking on one of the buttons in the window such as "**Select all Blue**". The first selection method should be used to change only some markers of a given color. The second method should be used when all markers of a given color need to be changed.

Network/Change PIN Off Map Artillery. This menu item produces a listing of all off map artillery of a given color - for example all Blue off map artillery. The listing shows the current PIN of each listed item. To change the PIN for any listed item, double click on that item in the list. A small window will then appear into which can be typed a new PIN for that item. The

umpire may also use a button in this window to set the PIN of all off map artillery of a given color.

Shortcut. If the "**C**" key is touched while an item in the list is selected, the PIN for that item will be copied to memory. If the "**V**" key is touched while an item in the list is selected, the last PIN to be copied into memory will be pasted into that item.

Network/Change PIN Air Support. This menu item produces a listing of all pending air sorties of a given color - for example all Blue sorties. The listing shows the current PIN of each listed item. To change the PIN for any listed item, double click on that item in the list. A small window will then appear into which can be typed a new PIN for that item.

Shortcut. If the "**C**" key is touched while an item in the list is selected, the PIN for that item will be copied to memory. If the "**V**" key is touched while an item in the list is selected, the last PIN to be copied into memory will be pasted into that item.

Network/Change PIN All. This menu item leads to a window which provides a "one click" method to instantly transfer all game items with a given PIN from one player to another.

The umpire may also assign PINs to units by right clicking on a unit marker and then selecting the "**Set PIN**" menu item from the unit popup menu list.

The umpire may also assign PINs to off map artillery units by using the "**Set PIN**" button in the **Artillery Support Window**.

The umpire may also assign PINs to air sorties by using the "**Set PIN**" button in the **Air Support Window**.

It is expected that the umpire will usually design a scenario from scratch using one of the custom scenario templates. The umpire will be able to assign PIN numbers easily to the unit markers as he adds them via the **Options/Add Optional Units** menu item or the "Options/Add One Unit" menu item.   However, if one of the precompiled game scenarios is used there may be times when some units begin the game off map with a delayed entry time and thus are more difficult to assign PINs to. In this case an entry point selection window will appear during the first orders phase of the game for each group of units that have a delayed entry time.   At this instant a PIN can be assigned to every unit in that group by typing a value into the **Set Pin** text box located in the upper right corner of that window and touching the return key.

4. Game startup instructions for the Umpire.

Start TacOps v4. When the startup window appears ...
Select the check box for "**Multiplayer Teams - Networ**k".
Select the check box for "**Host Game**".
Click the **OK** button.

Select a scenario or a custom scenario template and map .

Create and set up all unit markers on the map for all players and all force colors.
Preplan a PIN (and call sign if desired) for each player that will be joining the game. Observers
do not need a PIN – the program will automatically assign a PIN of 201 to all observers.

Assign appropriate PINs from the above roster to all unit markers, off map artillery elements,
and airstrike sorties. Any unit or element that retains the default PIN of zero will belong to the
umpire. Except for zero, do not assign the same player PIN to items of different colors.

If team colors other than Blue and Red are to be used, the umpire must use the **Options/Rules of
Engagement** menu item to set force wide Rules of Engagement for the additional teams. The
default setting for the Blue and Red teams is that they will engage each other's markers at any
opportunity but they will not engage the markers of other team colors unless attacked. The
default setting for team colors other than Blue and Red is that they will not engage any other
marker color unless attacked. The **Options/Rules of Engagement** menu item produces a
window that allows these Rules of Engagement to be changed. This window presents a matrix of
possible color X vs color Y interactions. If a given color vs color interaction button in the matrix
is set to "**Free Fire**" then markers of the first color will engage markers of the second color at
any opportunity. If a given color vs color interaction is set to "**Self Defense**" then markers of the
first color will engage markers of the second color only after being attacked.

After setting the force wide Rules of Engagement, the umpire can choose to give different Rules
of Engagement to individual unit markers. This is done by clicking on a unit marker so as to
open its unit orders window and then clicking on the button in the window labeled "**Rules of
Engagement**".

For safety, save the current situation as a saved game file now.

Select the **Network/Log Onto Network** menu item. When the logon window appears note that
your LAN IP address is displayed in the small black box with green lettering in the upper right
corner of the window.   Record your address so that you can later provide it to the joining players
[see important note below for Internet games]. They must use this address in order to join the
game session that you are hosting. Enter the call sign that you want to use in the "**Call Sign**"
box. Click the **OK** button.

[Note: The LAN IP address shown in the small black box with green lettering is probably not
the same as your Internet IP address. If you are hosting an Internet game you must tell the
players your Internet IP address and not your LAN IP address. You will need to discover your

Internet IP address by some means outside of TacOps. LAN IP addresses usually begin with the number "192".]

If all goes well, you will see a message at the bottom of the screen that says "Listening for someone to join the TacOps network" – otherwise you will get an error window or error message.

Tell the remote players what your LAN IP address [or Internet IP address] is and tell them to try to join the game.

As each player tries to join the game, a joining alert window will appear on the umpire computer asking if it is OK to let the person join the game. If the joiner has picked the wrong force color, the wrong scenario or map, or any of several other possible errors these errors will be displayed in the joining window. If errors are shown, the umpire may need to immediately disconnect the joining player and then tell him to restart TacOps using the correct items.

The umpire must assign a game unique PIN to the joining player. There is a text entry box in the joining alert window for this purpose. The umpire will also be shown what force color (team) the joiner has chosen and his desired call sign. If these settings do not match the umpire's wishes then the umpire can unilaterally change them with buttons and controls in the joining window. Once all is in order then the umpire clicks the **OK** button to admit the joining player.

Once all players have successfully joined the game network the umpire must transmit a situation update to all players in order for them to receive their units and the current overall game situation. Select the **Network/Send Situation Update To All** menu item. This will automatically transmit a situation update to all players. The progress of the situation update will be displayed in the information line at the bottom of the map window. Any errors in the transmission will be reported with an error sound and either an alert window or a message in the information line. If the situation update is successful, the players can proceed to giving orders to their units. If the situation update fails, the umpire should take appropriate steps to correct the network problem.

5. Game startup instructions for Players.

 Obtain the following information from the umpire: the scenario file name, the scenario map number if a custom scenario template is being used, the umpire's LAN IP address [or Internet IP address], your network call sign, and your team assignment (Blue through Yellow - or Observer). Determine how the umpire will later cue the players to begin trying to join the game network.

Start TacOps v4. When the startup window appears:
Select the check box for "**Multiplayer Teams - Network**"
Select the check box for "**Join Game**"
Click the **OK** button.

Select the scenario or custom scenario template and map specified by the umpire. A map will appear on your screen but there will be no units displayed.

When instructed to do so by the umpire, select the "**Network/Log Onto Network**" menu item. When the logon window appears, enter the umpire's LAN IP address [or Internet IP address] into the four tan colored boxes in the upper right corner of the window. Do not enter any periods - just enter the four number blocks that make up an IP address - one block in each box. Enter a call sign in the red text box below the IP address boxes. Select the check box for your umpire assigned team color (Blue through Yellow). Click the OK button.

If all goes well, you will see a message at the bottom of the screen that says that you have joined the TacOps network. If all does not go well you will get an error sound and an error message will be shown in the information line at the bottom of the TacOps map window.

Once all players have successfully joined the game network the umpire will transmit a situation update to all players. The progress of the situation update will be displayed in the information line at the bottom of the battle map. Any errors in the transmission will be reported with an error sound and either an alert window or in the information line. At the end of the situation update your units will appear on your map and you may begin giving orders to them.

6. Network Menu Items.

The following items in the **Network Menu** list perform the indicated functions.

"**Network Status**". This menu item will display a window listing the players who are currently logged onto the game network. The umpire can disconnect a player by selecting that player's call sign in the window list and then selecting the "Disconnect Selected Player" button. The umpire can send a situation update to just one player at a time by selecting that player's call sign in the window list and then selecting the "Send Situation Update to Selected Player" button. There are no routine uses for these features. They are provided to the umpire for use in undefined problem situations where they may seem applicable.

```
┌─────────────────────────────────────────────────────────┐
│ □  ═══════════ Network Report ═══════════  □             │
│  ┌────────────────────────────────────────────────┐ ▲   │
│  │ PIN: 000, Umpire, Umpire, Orders not finished. [1, 1] │ ▓ │
│  │ PIN: 001, Outlaw 6, Blue, Orders not finished. [1, 1] │ ▓ │
│  │                                                 │ ▼   │
│  └────────────────────────────────────────────────┘     │
│                                                          │
│  [x, y] x = seconds required for last orders exchange    │
│         y = seconds for last situation update.           │
│  ┌─────────────────────────────┐  ┌──────────────────┐   │
│  │ Disconnect Selected Player  │  │ Copy To Clipboard│   │
│  └─────────────────────────────┘  └──────────────────┘   │
│  ┌─────────────────────────────────┐  ┌──────────────┐   │
│  │ Send Situation Update To Selected Player │ Save As Text │ │
│  └─────────────────────────────────┘  └──────────────┘   │
│  ┌─────────────────────────────────┐                     │
│  │ Get orders from selected player.│                     │
│  └─────────────────────────────────┘                     │
└─────────────────────────────────────────────────────────┘
```

The network status window has not yet been coded for use as a full time network monitor. It can interfere with network communications. Do not leave the network status window open any longer than absolutely necessary. Do not try to use the network status window to monitor orders updates or situation updates.

"**Umpire Controls Turns**". If this item is check marked, the umpire must select the "Begin Combat" menu item on the umpire computer before each movement and combat phase can take place. If this item is not check marked then each movement and combat phase will be started automatically as soon as every remote player has selected the "Begin Combat" menu item on their computers.

"**Automatic Turns**". If this item is check marked, each movement and combat phase will be started automatically as soon as every remote player has selected the "Begin Combat" menu item on their computers. If this item is not check marked then the umpire must select the "Begin Combat" menu item on the umpire computer before each movement and combat phase can take place.

More Network Tools. This menu item will display a window containing the following items.

"**Disable the menu bar on all remote computers**". Check marking this button will send a signal to all remote computers that disables their menu bar to prevent the players from accessing menu items and giving orders to their units. Unchecking this button will send a signal to all remote computers to restore the players' access to game functions. This feature is useful for preventing players from inadvertently disrupting umpire midgame activities such as adding or deleting units, changing PIN assignments, working on network or computer problems, etc.

"**Enable Umpire Tools menu item on all remote computers**". Check marking this button will send a signal to all remote computers that enables the "**Options/ Enable Umpire Tools**" menu item. This menu item should normally be disabled on all computers except the umpire computer. Unchecking this button will send a signal to all remote computers to disable this menu item. This feature is useful for temporarily allowing players to instantly reposition their unit markers with the shift + click procedure that is otherwise normally available only during the setup turn.

"**Send Combat Done message to all**". This menu item will send a signal to all computers indicating that the movement and combat phase has ended for all players. This signal will also re-enable the disabled menu bar on the remote computers. This is useful for the occasional network error which leaves all players locked out of their computer. Otherwise there is no routine use for this feature. It is provided to the umpire for use in undefined problem situations where it may seem applicable.

"**Send Sound To All**". This menu item will cause all remote computers to play a loud attention gaining sound. There is no routine use for this feature. It is provided to the umpire for use in undefined problem situations where it may seem applicable.

7. Miscellaneous Notes.

It is possible in a multiplayer game to have team (friendly) fog-of-war in addition to the normal enemy fog-of-war.   If friendly fog-of-war is enabled, a player will not be able to see a unit marker belonging to a teammate on his computer screen unless that marker is in a clear line of sight and within legal spotting distance of one of his own units. For example, Blue Player PIN 1 will not be able to see a unit marker that belongs to Blue Player PIN 2 unless that marker is legally spotted by one of Blue Player PIN 1's units. Friendly fog-of-war is controlled by a check box in the normal fog-of-war window**.** To enable or disable friendly fog-of-war, select the **Options/Change Fog-Of-War** menu item to open the **Fog-of-War** window and then mark or clear the check box in the lower left corner labeled "Enable friendly vs friendly fog-of-war".

The "**Map/Hide Units W Different PIN**" menu item will hide all unit markers that do not belong to the player on a given computer.

If the umpire uses any menu item in the **Options** menu, he should send a manual situation update to all players prior to allowing the execution of the next combat phase. Otherwise the changes made by the umpire may not be passed to all players.

If the umpire uses the **Orders/Duplicate Units** menu item, he should send a situation update to all players prior to allowing the execution of the next combat phase. Otherwise the duplicated units may not be passed to all players.

Currently there are five ways to execute an orders exchange and combat cycle in TacOps v4. Adroit use of these options can speed game play greatly. The umpire can choose to use any of these options at any time during a game.

1) Each player and the umpire selects the **Combat/Begin Combat** menu item to signal the host computer that he is finished giving orders. Once the umpire and all players have so signaled, the host computer automatically collects orders from each player, the host computer then rationalizes the individual player orders into a single orders update, and then the host computer automatically sends that orders update on to every player. The combat phase then executes automatically on all computers.

2) The umpire can choose to take himself out of the turn cycle by uncheck marking the Network/ **Umpire Must Start Combat** menu item. If this menu item is not check marked then orders exchange and the running of each movement and combat phase will be started automatically by the umpire computer as soon as every remote player has selected the **Combat/Begin Combat** menu item on their computers.
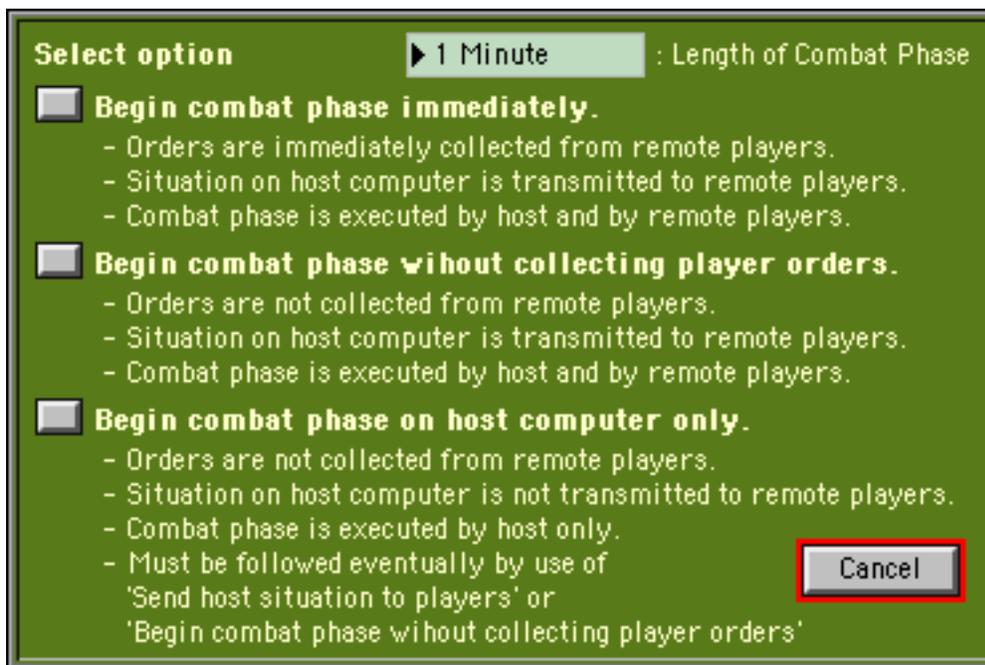
3) The umpire can use the **Combat/Begin Combat With Options** menu item to arbitrarily force the start of an automatic group orders exchange and combat cycle even if some or all of the players have not yet signaled that they have finished giving orders. The umpire can also direct the automatic execution of one to five combat phases after the group orders exchange by clicking on the cyclic control labeled "Length of Combat Phase".

4) The umpire can use the **Combat/Begin Combat With Options** menu item to arbitrarily start a combat phase on all computers without collecting orders from the players but still allow the players to view the execution of the combat phase on their computers. If this option is used, the host computer simply sends the master situation that is on the host computer to all players along with a signal to begin combat using only what is in that master situation.

5) The umpire can use the **Combat/Begin Combat With Options** menu item to run one or more combat phases just on the host computer without getting any data from the players and without sending any data to the players. In this case orders are not auto collected from the players, the master situation on the host computer is not auto sent to the players, and the combat phase is not auto executed on the player computers. Once the umpire has run however many turns that he wants, he must then manually transmit a situation update to the players before returning to the normal orders phase/combat phase cycle. **CAUTION** - failure to transmit the situation update prior to executing an automatic group orders exchange and combat cycle may seriously damage the game.

Appendix L - Glossary

2S1 Tracked 122mm self propelled howitzer, OPFOR
2S23 120mm SP Mortar Wheeled mortar carrier, OPFOR
2S3 Tracked 152mm self propelled howitzer, OPFOR
2S6 SP AAA/SAM Tracked air defense system, OPFOR
2S?? 120mm SP Mortar Tracked 120mm self propelled mortar, OPFOR
4x4 Four wheel drive vehicle
6x6 Six wheel drive vehicle
AAA   Antiaircraft artillery
AAAVC Advanced amphibious assault vehicle command, USMC
AAAVP Advanced amphibious assault vehicle personnel, USMC
AAVC7 Amphibious assault vehicle command, USMC
AAVP7 Amphibious assault vehicle personnel, USMC
AAVR7 Amphibious assault vehicle recovery , USMC
ACRV   Artillery command and recon vehicle, OPFOR
AD Air defense
ADATS Air defence antitank system, CA
AFV   Armored fighting vehicle
AG Assault gun
AGS17   Automatic grenade launcher 30mm, OPFOR
AH1 Cobra Helo   Attack helicopter, US
AH64   Apache attack helicopter, US
Apache   AH64 attack helicopter, US
APC Armoured personnel carrier
Arty artillery
ARV   Armoured recovery vehicle
ARVL   Armoured recovery vehicle light
ARVM   Armoured recovery vehicle
AT Antitank
AT Gun Antitank gun
AT3 ATGM Sagger   Antitank guided missile, OPFOR
AT4 Light antiarmor rocket launcher, US
AT4 ATGM Spigot Antitank guided missile, OPFOR
AT7 ATGM Saxhorn   Antitank guided missile, OPFOR
ATGM   Antitank guided missile
AU Australia
Bison Ambulance   Wheeled light armoured ambulance, CA
Bison APC   Wheeled light armoured infantry section carrier, CA
Bison CP Wheeled light armoured command and control vehicle, CA
Bison Mortar Carrier   Wheeled light armoured 81mm mortar carrier, CA
Blackhawk   UH60 transport helicopter, US
BM21 MRL   Wheeled multiple rocket launcher, OPFOR
BMD1 IFV   Tracked armored infantry squad carrier, OPFOR
BMP1 IFV   Tracked armored infantry squad carrier, OPFOR
BMP2 IFV   Tracked armored infantry squad carrier, OPFOR
BMP3 IFV   Tracked armored infantry squad carrier, OPFOR
Bradley   M2 or M3 infantry fighting vehicle, US
BRDM2 APC Wheeled armored recce vehicle, OPFOR
BRDM2 AT   Wheeled armored ATGM carrier, OPFOR
BREM1 ARV Heavy tracked recovery vehicle, OPFOR
BTR Ambulance   Wheeled armored ambulance, OPFOR
BTR80 APC   Wheeled armored infantry squad carrier, OPFOR
BTR80A APC Wheeled armored infantry squad carrier, OPFOR
BTR90 APC   Wheeled armored infantry squad carrier, OPFOR
C&C   Command and control
C6 MG   CA 7.62mm machine gun, CA
C9 MG   CA 5.56mm machine gun, CA
CBU   Cluster bomb unit
CH146 Griffon Helo   Transport helicopter, CA

CH46 Helo   Transport helicopter, US
CH47 Helo   Transport helicopter, US
CH53 Helo   Transport helicopter, US
CM Countermortar
Cmd Command
CA   Canada
Cobra   AH1 attack helicopter, US
COLT   Combat observation lasing team, US
Comms   Communications
COP Combat observation post, OPFOR
Corpsman   Medical personnel, USMC
Cougar FSV   Wheeled light armoured fire support vehicle, CA
Coyote Cmd   Wheeled light armoured command and control vehicle, CA
Coyote FSV   Wheeled light armoured fire support vehicle, CA
Coyote Recce (M)   Wheeled vehicle with mast surveillance suite, CA
Coyote Recce (T)   Wheeled vehicle with tripod surveillance suite, CA
CSS Combat service support
DF TRP   Direct fire target reference point
Dragon2 ATGM   Antitank guided missile, US
E/PNR   Engineer/Pioneer
EHRSA   Equivalent homogeneous rolled steel armor
Eryx ATGM   Antitank guided missile, CA
FAASV   Field Artillery Ammunition Support Vehicle, US/CA
FISTV   Fire support team vehicle, US
FO   Forward observer, artillery observer, US
FOO   Forward observation officer, artillery observer, CA
FOO/MFC   Forward observation officer/mortar fire control, CA
FSV Fire support vehicle
GAZ66   Light truck, OPFOR
GP   General purpose
Grizzly   Wheeled light armoured infantry section carrier, CA
Grizzly Ambulance Wheeled light armoured ambulance, CA
Grizzly RRB   Wheeled light armoured radio rebroadcast vehicle, CA
HALO   Mi26 transport helicopter, OPFOR
HAVOC Mi28 attack helicopter, OPFOR
HE   high explosive
HEAT   high explosive antitank
Helo Helicopter
HEMTT Heavy expanded mobility tactical truck, US
HIND   Mi24 attack helicopter, OPFOR
HIP Mi8/17 transport helicopter, OPFOR
HLVW   Heavy logistic vehicle wheeled, CA
HMG   Heavy machine gun
HMMWV   High mobility multipurpose wheeled vehicle, US
HMMWV + HMG HMMWV with .50 caliber machine gun, US
HMMWV + LMG HMMWV with 7.62 machine gun, US
HMMWV + MK19 HMMWV with 40mm grenade launcher, US
HMMWV Air Defense   HMMWV with air defense weapons, US
HMMWV AT HMMWV with TOW ATGM, US
HMMWV Mortar Carrier   HMMWV with 81mm mortar, US
HQ   Headquarters
HQ Command command element
HQ Comms Team   HQ communications personnel
HQ CSS Team   HQ combat service support personnel
HQ Ops Team HQ operations personnel
Husky AMRV Wheeled armoured recovery vehicle, CA
Hwtzr   Howitzer
ICM improved conventional munitions
IFV Infantry fighting vehicle
Iltis LUVW   Light utility vehicle wheeled, CA
Iltis LUVW TOW   Iltis LUVW with TOW ATGM, CA
Inf   infantry

IQ91   Indicates T72M tank used by Iraq in 1991
ISC Infantry section carrier, CA
ITV Improved TOW vehicle, US
Javelin ATGM   Antitank guided missile, US
Javelin S15 SAM   Surface to air missile, also known as Starburst, CA
Kiowa   OH58 helicopter, US
LAAW   Light antiarmor weapon
Landing Craft Air Cushion   Ocean surf capable
Landing Craft Large   Ocean surf capable
Landing Craft Medium Ocean surf capable
Landing Craft Small   Ocean surf capable
LAV III FOO/MFCLight armored vehicle III forward observer/mortar fire control variant, CA
LAV III ISC   Light armored vehicle III infantry section carrier, CA
LAV III PNR Light armored vehicle III pioneer/engineer variant, CA
LAV III TCP Light armored vehicle III command and control variant, CA
LAV III TUA Light armored vehicle III with TOW under armour, CA
LAV-25 Light armored vehicle personnel carrier, US
LAV-AD Light armored vehicle air defense variant, US
LAV-AG Light armored vehicle assault gun variant, US
LAV-AMRV Light armored vehicle recovery, US
LAV-AT Light armored vehicle TOW ATGM variant, US
LAV-C&C   Light armored vehicle command and control, US
LAV-Logistics   Light armored vehicle bulk cargo carrier, US
LAV-M Light armored vehicle mortar carrier, US
LAV-Mortar Carrier   Light armored vehicle mortar carrier, US
LAW   Light antiarmor weapon
Leopard 1A5 Main battle tank, AU/NZ
Leopard 2   Main battle tank, possible future CA
Leopard 2 Cmd Tank   Main battle tank with command communications
Leopard 2 Dozer   Main battle tank with dozer blade
Leopard 2 Tank   Main battle tank
Leopard ARVM   Tracked armoured recovery vehicle, AU/NZ
Leopard C1 Cmd Tank   Main battle tank with command communications, CA
Leopard C1 Dozer Main battle tank with dozer blade, CA
Leopard C1 Tank   Main battle tank, CA
Leopard C2 Cmd Tank   Main battle tank with command communications, CA
Leopard C2 Dozer Main battle tank with dozer blade, CA
Leopard C2 Tank   Main battle tank, CA
LG1 105mm Hwtzr Wheeled howitzer, CA
LMG   Light machine gun
LR Land Rover, AU/NZ
LR 4x4   Light wheeled utility vehicle, AU/NZ
LR 4x4 GL   Land Rover with 40mm auto grenade launcher, AU/NZ
LR 4x4 HMG Land Rover with 12.7mm machine gun, AU/NZ
LR 4x4 LMG Land Rover with 7.62mm machine gun, AU/NZ
LR 4X4 SOV + GL Land Rover SOV with 40mm auto grenade launcher, AU/NZ
LR 4X4 SOV + HMG   Land Rover SOV with 12.7mm machine gun, AU/NZ
LR 4X4 SOV + LMG   Land Rover with 7.62mm machine gun, AU/NZ
LR 6x6   Land Rover light wheeled utility vehicle, AU/NZ
LR 6x6 w HMG   Land Rover with 12.7mm machine gun, AU/NZ
LR 6x6 w LMG   Land Rover with 7.62mm machine gun, AU/NZ
LSVW   Light support vehicle wheeled, CA
LUVW   Light utility vehicle wheeled, CA
Lynx RV Tracked reconnaissance vehicle, CA
M106 Mortar Carrier   Tracked 4.2 inch mortar carrier, US
M109 155mm SP Hwtzr Self propelled howitzer, US
M113   Armored personnel carrier, squad/section carrier, US/CA
M113 + Milan2 ATGM Possible future system, CA
M113 Ambulance   Tracked ambulance, US/CA
M113 APC   Tracked infantry squad/section carrier, US/CA
M113 ARVL   Tracked recovery vehicle, US/CA
M113 CM Radar   Countermortar radar, US/CA

M113 E/PNR Engineer/Pioneer vehicle, CA
M113 FOO/MFC   Forward observer/mortar fire control, CA
M113 FSV 25mm A   Fire support vehicle with 25mm auto cannon, AU/NZ
M113 FSV 25mm B   Fire support vehicle with 25mm auto cannon and thermal sights, AU/NZ
M113 FSV 76mm   Fire support vehicle with 76mm gun, AU/NZ
M113 MRT   Mobile repair team, CA
M113 PPS5 Radar Ground surveillance radar, US
M113 PWS   Protected weapons system, CA
M113 T50 12.7mm APC with fully enclosed turret, AU/NZ
M113 T50 7.62mm APC with fully enclosed turret, AU/NZ
M113 TUA   Tracked TOW ATGM under armour, CA
M113 w 81mm Mortar   Tracked mortar carrier, US/CA
M113 w ADATS   Air defense and antiarmour weapon, CA
M119 105mm Hwtzr   Wheeled howitzer, US
M125 Mortar Carrier   Tracked 81mm mortar carrier, US/CA
M163 Vulcan SP AAA   Antiaircraft artillery, tracked vehicle, US
M167 Vulcan AAA Antiaircraft artillery, wheeled trailer, US
M198 155mm Hwtzr   Wheeled howitzer, US
M1A1 Tank   Main battle tank, US
M1A2 Tank   Main battle tank, US
M2 Bradley   Armored IFV, squad carrier, US
M203   Grenade launcher mounted on service rifle, US/CA
M3 Bradley   Scout version of Bradley IFV, US
M47 Dragon2 ATGM   Antitank guided missile, US
M548 Ammo Tracked cargo carrier, ammunition, US/CA
M548 Cargo   Tracked cargo carrier, misc cargo, US/CA
M548 Load Carrier Tracked cargo vehicle, misc cargo, US/CA
M548 POL   Tracked fuel carrier, US/CA
M551 Sheridan Tank   Obsolete tank, missile firing, US
M577 Command Post   Tracked armored command and control vehicle, US/CA
M578 AMRV Tracked armored recovery vehicle, US/CA
M578 MRV   Tracked armored recovery vehicle, US/CA
M60A1 Tank Main battle tank, US
M60A3 Tank Main battle tank, US
M72 LAW   Light antiarmor weapon, US/CA
M88 AMRV   Heavy tracked armored recovery vehicle, US
M901 ITV   Improved TOW vehicle, US
M977 HEMTT Cargo   Heavy expanded mobility tactical truck, US
M978 HEMTT Fuel   Heavy expanded mobility tactical truck, US
M981 FISTV Fire support team vehicle, US
M992 FAASV Field Artillery Ammunition Support Vehicle, US/CA
MBT   Main battle tank
Medic   Medical personnel
MG Machine gun
Mi24 Hind Helo   Attack helicopter, OPFOR
Mi26 HALO Helo Transport helicopter, OPFOR
Mi28 Havoc Helo   Attack helicopter, OPFOR
Mi8/17 HIP Helo   Transport helicopter, OPFOR
Milan ATGM Possible future ATGM for CA
MK19 AGL   40mm automatic grenade launcher, US
MLRS   Multiple launch rocket system, US
MLVW   Medium logistic vehicle wheeled, CA
MRL   Multiple rocket launcher, OPFOR
MRT   Mobile repair team, CA
MTLB APC   Tracked multipurpose vehicle, OPFOR
MV22 Osprey USMC tilt rotor aircraft, US
NZ New Zealand
OH58 Kiowa Helo AT   Observation and light attack and helo armed for antiarmor mission, US
OH58 Kiowa Helo GP   Observation and light attack and helo armed for general purpose mission, US
OP Observation post
OP OPFOR, opposing force
Ops Operations

PKM   Machine gun
PNR Pioneer/engineer
PPS5   Ground surveillance radar, US
PWS   Protected weapons system, CA
Recce   Reconnaissance
Recon   Reconnaissance
RPG Rocket propelled grenade, OPFOR
RPK Machine gun, OPFOR
RPV Remotely piloted vehicle
RRB   Radio rebroadcast vehicle, CA
RV Reconnaissance vehicle
SA16 SAM   Surface to air missile, OPFOR
SA7 SAM   Surface to air missile, OPFOR
SA7B SAM   Surface to air missile, OPFOR
SAM   Surface to air missile
SAW   Squad automatic weapon, US
Saxhorn AT7 antitank guided missile, OPFOR
SMAAW Shoulder fired multipurpose antiarmor weapon, US
SOP Standard operating procedure
SOV   Special operations vehicle
SP Self propelled
SP Hwtzr Self propelled howitzer
SP Mortar   Self propelled mortar
SPG9   Recoilless antitank gun/rocket launcher, OPFOR
Spigot   AT4 antitank guided missile, OPFOR
SRAAW Short range antiarmour weapon
Starburst Surface to air missile - known as Javelin in CA Army
Stinger   Surface to air missile, US
T-12/MT-12 100mm AT Gun Wheeled antitank gun, OPFOR
T55M M1974 Tank Main battle tank, OPFOR
T55M M1974+ Tank   Main battle tank, modernized version, OPFOR
T62M M1975 Tank Main battle tank, OPFOR
T62M M1975+ Tank   Main battle tank, modernized version, OPFOR
T72M Tank   Main battle tank, OPFOR
T72M Tank   Main battle tank, OPFOR
T72M Tank [IQ91] Main battle tank, low capability export model used by Iraq in Desert Storm, OPFOR
T80U Tank   Main battle tank, OPFOR
T80U Tank ATGM Main battle tank, with antitank guided missile capability, OPFOR
Taurus ARV   Heavy tracked armoured recovery vehicle, CA
TCP Tactical command post
FOT Tank   Future OPFOR Tank
TOW   Antitank guided missile, US/CA
TRP Target reference point
TUA   TOW under armour, CA
UAV   Unmanned aerial vehicle
UAZ469 Light Truck   Truck, light, OPFOR
UH1N Iroquois Helo   Transport helicopter, US
UH60 Blackhawk Helo Transport helicopter, US
US United States
USMC   United States Marine Corps
VTT323 IFV   APC infantry squad carrier, Chinese/North Korean
XM8 AGS Tank L1   Armored gun system, level 1 armor, US
XM8 AGS Tank L2   Armored gun system,, level 2 armor, US
XM8 AGS Tank L3   Armored gun system, level 3 armor, US
ZSU-23-4   Wheeled antiaircraft artillery, OPFOR
ZSU-23-4 AAA   Tracked antiaircraft artillery, OPFOR

Appendix X - Shortcuts - Windows

F1	Help/Display User Guide.	Ctrl D	Duplicate Units.
F2	Change Unit Symbol Size.	Ctrl F	Set engagement range.
F3	Change Unit Symbol Info.	Ctrl H	Hide All Units.
F4	Change Unit Symbol Style.	Ctrl L	Line of Sight Check.
F5	Turn on/off a map overlay.	Alt L	Thermal Line of Sight Check.
F5 + Shift	Load a different map overlay.	Ctrl M	Show Situation Map.
F6	Turn on/off map place names.	Ctrl N	New Game.
F8	Turn on/off map terrain analysis.	Ctrl P	Pause/unpause a network game.
F9	Turn on/off continuous display in the info line of the UTM coordinates of the current cursor location.	Ctrl Q	Quit.
		Ctrl R	Redraw Map.
		Ctrl S	Save Game.
		Ctrl Shift J	Join Unit.
F12	Open the network chat window.	Ctrl Shift L	Load Unit.
Esc	Often closes an open window.	Ctrl Shift S	Split Unit.
Esc	Cancel a pending request for user input.	Ctrl Shift U	Unload Unit.
		Ctrl T	View Terrain.
Esc	Unselect all selected unit markers.	Ctrl W	Often closes an open window.
Tab	Turns on/off the display of descriptive text to the right of unit markers.	Ctrl V	Paste Orders.
		Ctrl V + Alt	Append Orders.
		Ctrl X	Delete Units.
Tab + Shift	Turns on/off the display of Player Identification Numbers (PINs) to the right of unit markers.	Ctrl Z	Air Support.
		Ctrl + click	On unit, opens a unit popup menu.
		Right click	On unit, opens a unit popup menu.
Ctrl +	Add One Unit.	Alt + click	On arty target marker, opens
Ctrl A	Artillery Support.		Artillery Support Window.
Ctrl B	Begin Combat.	Alt + click	on air target marker, opens Air
Ctrl C	Copy Orders.		Support Window.

Special Cases when the Unit Orders window is open

U	Unload Unit.
L	Load Unit.
S	Split Unit.
J	Join Unit.
X	Deletes all unit orders.
-	Deletes one unit order.
Shift + click	On map, orders a unit to move to a way point in reverse gear.
Double click	On unit, closes current unit orders window. Opens new unit orders window.
window.	

Special Cases when the Deployment window is open and one or more unit markers are selected.

U	Unload all selected units.
L	Load all selected units.
S	Split all selected units.
J	Join all selected units.

Appendix X - Shortcuts - Macintosh

F1	Help/Display User Guide.	Cmd B	Begin Combat.
F2	Change Unit Symbol Size.	Cmd C	Copy Orders.
F3	Change Unit Symbol Info.	Cmd D	Duplicate Units.
F4	Change Unit Symbol Style.	Cmd F	Set engagement range.
F5	Turn on/off a map overlay.	Cmd H	Hide All Units.
F5 + Shift	Load a different map overlay.	Cmd L	Line of Sight Check.
F6	Turn on/off map place names.	Cmd ;	Thermal Line of Sight Check.
F8	Turn on/off map terrain analysis.	Cmd M	Show Situation Map.
F9	Turn on/off continuous display in the info line of the UTM coordinates of the current cursor location.	Cmd N	New Game.
		Cmd P	Pause/unpause a Network Game
		Cmd Q	Quit.
		Cmd R	Redraw Map.
F12	Open the network chat window.	Cmd S	Save Game.
Esc	Often closes an open window.	Cmd T	View Terrain.
Esc	Cancel a pending request for user input.	Cmd W	Often closes an open window.
		Cmd V	Paste Orders.
Esc	Unselect all selected unit markers.	Cmd V + Alt	Append Orders.
Tab	Turns on/off the display of descriptive text to the right of unit markers.	Cmd X	Delete Units.
		Cmd Z	Air Support.
		Ctrl + click	On unit, opens a unit popup menu.
Tab + Shift	Turns on/off the display of Player Identification Numbers (PINs) to the right of unit markers.	Right click	On unit, opens a unit popup menu.
		Alt + click	On arty target marker, opens Artillery Support Window.
Cmd +	Add One Unit.	Alt + click	on air target marker, opens Air Support Window.
Cmd A	Artillery Support.		

Special Cases when the Unit Orders window is open

U	Unload Unit.
L	Load Unit.
S	Split Unit.
J	Join Unit.
X	Deletes all unit orders.
-	Deletes one unit order.
Shift + click	On map, orders a unit to move to a way point in reverse gear.
Double click	On unit, closes current unit orders window. Opens new unit orders window.

Special Cases when the Deployment window is open and one or more unit markers are selected.

U	Unload all selected units.
L	Load all selected units.
S	Split all selected units.
J	Join all selected units.