1 Introduction

Many TacOps features were still in testing when this guide was written.   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 primarily a simulation of contemporary and near-future tactical, ground, combat between United States (US) and Canadian (CN) 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 simulation 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 players on one or two computers. Play between two 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 your views.

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

2 Installation

Start up Microsoft Windows.   Open the Windows utility named "File Manager" and use it to run the TacOps install file.

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.

2.1 Minimum System Requirements

IBM compatible 386 or better.   Microsoft Windows Version 3.1 or newer.   Four megabytes of memory remaining for TacOps after your Operating System has loaded.   A hard disk drive.   Color monitor providing at least 16 colors /shades of gray - more colors are OK.

2.2 TacOps Files

TacOps works fastest and easiest if all scenario, map, and other support files are kept 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: This is the game engine. It requires Windows 3.1 (or newer) and a number of TacOps unique support files in order to function.

tacscen0.dll: This is the primary scenario data file for scenario set "zero". This file contains data defining (for all scenarios) 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 are formed with the words "Task Force" or "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.

filename.sce: This is an additional small data file needed for every scenario. This file serves mainly as a place holder so that the standard Windows file selection dialog can be used to select a scenario. Each "sce" filename begins with an abbreviated form of the scenario title that it represents. Examples - bastrain.sce loads the Basic Training scenario, cahoon.sce loads the Team Cahoon scenario, and craig1.sce loads the Task Force Craig One scenario.

wtacres.dll: This file contains the non scenario artwork and sounds used by the game engine.

mapxxx.map: This is a terrain data file containing the map art and terrain data base for one or more scenario files. Terrain data files begin with "Map" , continue with a number, and end with the ".map" extension.

photores.dll: This file contains the unit and weapon photos displayed by TacOps.

tphoto.exe is a subsidiary program that is used by TacOps to display the photo data base in a sequential fashion.

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

Autosave.tac: This file is produced automatically every time TacOps begins a combat phase - unless the user has disabled the autosave feature. 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.

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. The following two words are reserved for TacOps internal use and should never be used in the name of a saved game file - "netfile" and "ordfile".

Emailxxx.gmo and emailxxx.rmo: One of these files will be semiautomatically 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 begin with "email", continue with a number, and end with either "grn" or "red". For more information see the section on play by mail.

Esavexxx.gms and esavexxx.rms: 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. These files should always begin with "esave", continue with a number, and end with either "grn" or "red". For more information see the section on network play.

Netfile.grn, netfile.red, ordfile.grn, and ordfile.red.   These are temporary files that were automatically created by TacOps during a networked game session between two human players.   Normally you should never see these files but you might if one or both players quit a networked game improperly.   In such a case these temporary files might not be automatically deleted.   Generally, if you ever see these filenames in a TacOps folder or in a designated TacOps "shared directory", you should delete them 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.   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.   There is no serial number check for network usage.   We don't consider it necessary for you to purchase a second copy of TacOps in order to use the network mode on two computers, both of which you own.   You may install TacOps on your 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 a drum roll and or other sound effects.   You may skip past an introductory screen by pressing a key or clicking the mouse as the screen appears. You may skip them altogether by setting the Caps Lock key before running the program. If you use the Caps Lock key in this manner, be sure to release if before you begin to set up your units, as it may defeat some useful "power user" keyboard commands described later.   When the Startup Window appears, pick the type of game to be played by selecting Solitaire, Two Players (on one computer), Two Players - Network, Two Players - Serial, or Two Players - Mail.

If you select play-by-mail or play-by-network, you must also select whether you will command the US or the OPFOR force. In order to play a game using networked computers, the computers must either (1) be already active on a Local Area Network or (2) be collocated and connected by a serial/null modem cable. For more information see the section on network play.

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

You can also 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. If you wish to immediately run that scenario, just click in the button labeled "Run It" at the bottom of the window. Otherwise, click on the Cancel button to return to the startup screen.

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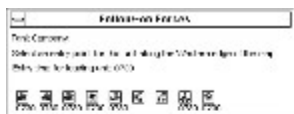
Units which start the game already on the map will appear in a window titled "Setup On map Units".

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, US 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 OPFOR 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 will be interpreted as a normal menu accelerator key press.

Shortcut - To make slight changes in the position of a unit during the setup turn, open the unit's orders window and hold down the shift key while pressing an arrow key.   The unit will shift one pixel in the direction of the arrow key.

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.

The information line is movable. Click anywhere inside it (except on the hand icon), hold down the mouse button and drag it to the desired position.

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/EO]" - 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/EO] [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.

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 in the lower right corner of the map window - all in the normal Windows fashion.

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.   Clicking inside the map area of the situation window will not only return to the regular map, it will also scroll and center the regular map to the same relative click point. Some maps may not have a miniature situation map display.
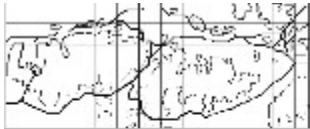
5.1 Terrain Symbols

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.
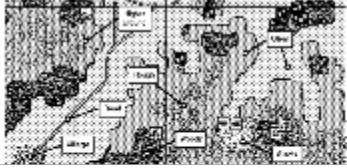
Movement along roads will be faster than other terrain. Rough and wooded terrain hinder movement speed. Some units can cross water and some can not.   Higher ground, woods, and villages/towns obstruct line of sight and line of fire. Woods and rough terrain offer defensive advantages and make it harder 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. You will need to experiment a bit to get a good feel for how wide this special area appears 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.
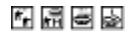
When the line of sight tool is in use, the range between the two points will be displayed in the information window at the bottom of the screen as well as the terrain type and the UTM grid coordinates of the end point.

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 type of symbol displayed select the Map/Change Symbol menu item.
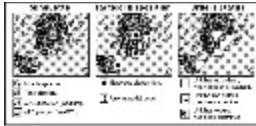
5.4 Unit Silhouette Symbols

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].

5.5 Unit Tactical Disposition Symbols

▶(Exposed) ⟩(Partial Cover or Defilade) ʒ(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. The photograph data base can be accessed from the menu or from the keyboard. Shortcut - hold down the Alt key while clicking on a unit symbol in the setup window or on the map. A photograph window for that unit will be displayed.   Alternately, select the Reports/Photo Data Base menu item. Photographs are contained in the support files named "photores.dll" and "tphoto.exe".   If the photograph feature does not seem to be working, make sure that these files are located at the same directory level as tacops.exe.

Shortcut - if the Control key is held down instead of the Alt key while clicking on a unit, the unit's information window will be displayed instead of the unit's photo.

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 Orders Window also provides unit information and access to other unit options.

6.1 Unit Orders Window

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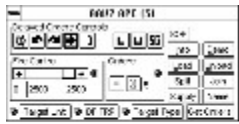
Non-movement orders are given using the buttons and icons inside the window. Generally, you give one order each time you click once on a button or icon. The icon will usually blink or appear to depress to acknowledge the order. The buttons and icons inside the box labeled "Delayed Orders Controls" give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

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.

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.

When you have finished giving orders to a unit you can close its Unit Orders Window by double clicking in its menu control box, or by pressing the Enter/Return key, the Escape key, or Control+W.   Note: any of these methods can usually be used to close any TacOps window or dialog.

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

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

Wait 15 seconds.
Change facing counterclockwise 45 degrees.
Change facing clockwise 45 degrees.
Change tactical disposition to exposed.
Helicopter down one level.
Helicopter up one level.
Helicopter to land.
Change tactical disposition to covered.
Enter entrenchment.
Load personnel into APC or helicopter.
Unload personnel. from APC or helicopter.
Fire smoke grenade.

The entrenchment button in the unit orders window does not give an order unless the center point of a unit is already over an entrenchment 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 ordered the unit to "enter" the entrenchment with a button press. It is not enough to just be on top of it.

6.3 Instant Unit Orders Controls

Note: Buttons that include an underlined or highlighted letter in the title can also be selected by pressing that letter on the keyboard.

The controls outside the "Delayed Orders Controls" box in the Unit Orders Window give orders that will be executed immediately.
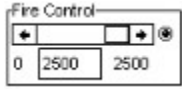
The Fire Control box shows and adjusts a unit's current engagement range limit between zero meters and the maximum useful range of its longest reaching weapon. Unit will not fire at any target to which the range is greater than what is set in this control, unless fired on first. Use the thumb control 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 "3000" 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. SHORTCUT - Hold down the Control key and click on the number in the box under the slider to set every unit in your force to that engagement range limit. 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 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.

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 right 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 small 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.

 Get the orders list from another unit on the map and append its orders to the end of the orders list for the unit with the open Unit Orders Window.   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 be appended to the end of the original unit's orders list.

 Marks a specific enemy unit as a priority target for the unit whose Orders Window is open. To set, click on the button and then click on the desired enemy unit. To clear an existing setting, click on the button and then click on an empty spot on the map or touch any key. Click this button alone to issue a low priority order. Hold down the Control key while clicking on this button to issue a high priority order. [See

later section on setting priority targets for an explanation of low and high priority orders.] The small circle to the left of this control 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. Click on the indicator light to display and highlight (scroll to and flash) the priority target unit.

⊕ DF TRP ‹   Marks a point on the map as a DF TRP (Direct Fire Target Reference Point) for the unit whose Orders Window is open and allows you to specify its active radius in meters. To set, click on the button and then click on the map. To clear an existing setting, click on the button and then touch any key rather than clicking on the map. Click this button alone to issue a low priority order. Hold down the Control key while clicking on this button to issue a high priority order. [See later section on setting priority targets for an explanation of DF TRPs and low and high priority orders.] The small circle to the left of this control 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. Click on the indicator light and hold down the mouse button to display a ring on the map showing the radius of the unit's DF TRP.

⊕ Target Type | Marks a specific type of enemy unit as a priority target type for the unit whose Orders Window is open - example, any T80 tank unit. To set, click on the button and then click on any visible enemy unit of the desired type. If there are no visible enemy units of the desired type, you can summon a text list of all enemy types in the game by clicking on an empty spot on the map and then selecting the desired type from the list. To clear, click on the button and then touch any key. Click this button alone to issue a low priority order. Hold down the Control key while clicking on this button to issue a high priority order. [See later section on setting priority targets for an explanation of low and high priority orders.] The small circle to the left of this control 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. Click on the indicator light and hold down the mouse button to display a text message stating the unit's priority target type.

SOP	Specify default behavior for a unit. See Unit SOP Window section for more detail.
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.
Split	Split unit into smaller units.
Join	Join two similar units into one unit.
Supply	Increase unit's ammunition supply.
Name	Add/delete optional text to/from name of unit.

6.4 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.

```
|— |            SOP              |
 ☐ Allow Fire Support On Own Position
 ☐ Cross Minefields

 ○ Stop If Fired On
 ○ Stop If Fired On & Pop Smoke
 ○ Reverse If Fired On    [ 200 ]  meters
 ○ Reverse If Fired On & Pop Smoke
 ☐ Unload If Fired On

 ○ Stop After Firing
 ○ Stop After Firing & Pop Smoke
 ○ Reverse After Firing   [ 200 ]  meters
 ○ Reverse After Firing & Pop Smoke
 ☐ Unload After Firing

 ☐ Take Evasive Action If Fired On

 |   OK    |  |  Clear  ||  Copy  |
 |  Cancel |  |  Set All Ground 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. 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 always cross an uncleared minefield (marking or clearing a lane as it goes) check this item.

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 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 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.

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: SOP options that include smoke, stop, unload, or reverse are one-time-only settings. These SOP settings are cleared each time that they are acted on.

Note 3: 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 4: The unload SOP settings may be combined with other settings.   If marked, the unit will unload before honoring any other SOP settings.

6.5 Supply Unit Button

The Supply Unit button in the Unit Orders Window summons a window that may allow you to replace expended ammunition.

Resupply					
Set desired supply percentage:	100%	-	+	100%	Resupply
1174	Supply points available.				Cancel
0	Points needed for this level of supply.				
(Any ammo increase will also resupply smoke.)					

Weapon	Max Load	On Hand	Rounds To Add
TOW ATGM	7	4	3
25mm Cannon	900	900	0
7.62mm Coax Machine Gun	2340	2340	0
M16 Rifle	900	900	0

Set the desired percentage of the unit's maximum ammunition load using the ⊖ ⊕ buttons at the top of the resupply window or click on the percentage number 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 make the resupply permanent, click the Resupply button.

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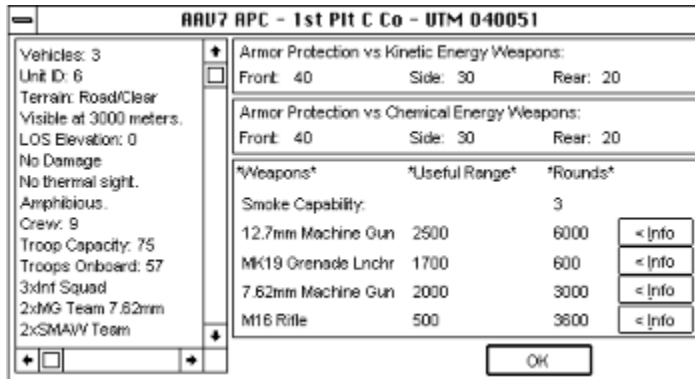
When a Unit Orders Window is open, detailed information about the unit may be obtained by clicking on the Unit Info button. This will produce an Information Window.

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 US 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 its actual thickness. The EHRSA number also includes average armor slope, if any.

If the Photo button is clicked, a window will appear showing a representative photograph of the unit or a similar unit. Some units may not have a photograph. If no photograph is available, the button will be dimmed.

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                                    │
├─────────────────┬───────────────────┬───────────────────┤
│ 120mm Gun       │ Minimum Range: 0   │ Useful Range: 3200│
│                 ├───────────────────┴───────────────────┤
│                 │ Antiarmor Effect: Kinetic energy.      │
├─────────────────┴───────────────────────────────────────┤
│ Range Reference Points:   0m   1000m  1500m   2000m  2500m  3200m │
│                                                          │
│ 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 │      OK      │
│ different range and ph for indirect fire.│─────────────────│
│                                          │     Photo       │
└──────────────────────────────────────┴───────────────────┘
```

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.

If the Photo button is clicked, a window will appear showing a representative photograph of the weapon. Some weapons may not have a photograph, or the photograph may be of the weapon in a slightly different configuration, or of a similar weapon. If no photograph is available, the button will be dimmed.

7 Movement

Units move during the combat phase according to their orders. Movement speed is effected 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:

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

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

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 "Target Unit", "Target Type", and "DF TRP". These priority settings can be soft or hard. Each of these buttons contains an indicator light in its lower right corner. A green light indicates that the button is not set, a yellow light 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. [See below for more detail on soft and hard priorities].

The "Target Unit" button 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" button 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" button 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 indicator lights next to the three priority targeting buttons can be clicked on to obtain information. If a unit has a priority target unit and you click on the indicator light to the left of the "Target Unit" button, the enemy unit that is the priority target will flash - if it is currently visible on the map. If a unit has a DF TRP and you click on the indicator light to the left of the "Set DF TRP" button, the radius of the DF TRP will be displayed as a ring around the DF TRP marker. If a unit has a priority target type and you click on the indicator light to the left of the "Target Type" button, a small text box will appear over the button with the name of the target type inside.

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 priority targeting order, you simply click on the appropriate target priority button. To give a high priority order, you must hold down the Control key while clicking on the appropriate 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 either the Off Map Artillery Support Window or an on map unit's indirect fire controls (see later paragraphs concerning off map and on map artillery support).

8.4 Mines

Some scenarios offer minefields in the basic setup or as optional units. The minefields are placed and may be repositioned during the first orders turn just like units. At the beginning of the first combat phase they will automatically be 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.

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, minefields will be hidden from enemy view until entered by an enemy unit. As a unit successfully crosses a minefield it will leave a narrow, marked lane behind it. This lane may be safely used by other friendly units if the lane is followed exactly. You may view lanes cleared or marked by friendly units by selecting the Map/Plot Minefield Lanes menu item. Units attempting to cross a minefield do so at a greatly reduced movement rate even when using a marked lane.

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: Off Map Artillery Support Window, Air Support Window, or the Orders Window of an on map artillery or mortar unit. Shortcut - hold down the Control key while clicking on the target marker for an off map artillery mission or an on map artillery mission or an air support mission - the control window for that mission will open 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 above. 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. Volleys will repeat automatically until you cease fire or run out of ammunition.

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 temporary clearing of artillery and air support markers, hold down the Control 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) button 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 ADJ (Adjusting Fire) button 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 buttons. 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.

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.

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, use the indirect fire buttons contained within the artillery or mortar unit's Unit Orders Window. These items function just like their counterparts in the Off Map Artillery Support Window.

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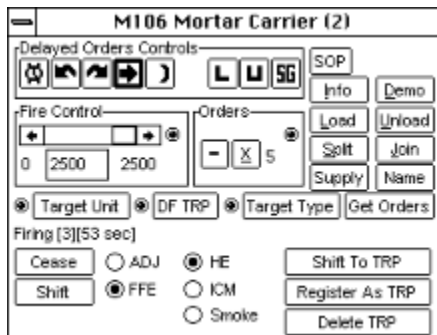
Shortcut - the program temporarily hides all fire support mission markers when marking or shifting "on map" artillery or mortar targets. If you do not want the markers to be temporarily hidden, you can prevent this by holding down the Control key as you click on the Mark or Shift Target buttons.

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.

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.

Air Support

F16/F18 enroute. 4 min to target.

AV8 on ground alert. 6 min to battle area.

F16/F18 on ground alert. 15 min to battle area.

Mark Target [X] Plot Fire Support

Shift Target [X] Plot TRPs
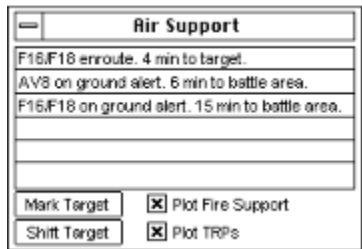
Each listing describes an air mission's current status. If an air support mission is underway the status line will state that the mission is enroute and will give the minutes until arrival at the target. If an air support mission is available but is not currently tasked, the status line will show how 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.

▯ = hit or super-near-miss.
▣ = unit suppressed.
▨ = one or more infantry casualties, but unit not totally eliminated.
▨ = mobility or weapon damage.
▨ = one vehicle destroyed or severely damaged.
▯ = unit totally eliminated.
▯ = 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 effected 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 effected 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, a "S" will be displayed. Suppressed vehicle units appear to move 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 there 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 effected by direct fire, artillery, or air strike unless their vehicle is destroyed or damaged. Infantry carried on a tank are exposed and may be effected 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 be stored in the Preferences Folder inside your System Folder and will carry over to any future game played. Most however, will only apply to the currently loaded scenario and any saved games it creates and will not permanently change the settings in the Preferences Folder inside your System Folder. The permanent and temporary settings are clearly indicated in the Preferences Window.

```
┌─────────────────────────────────────────┐
│ ▬      Preferences                       │
├─────────────────────────────────────────┤
│ Permanent Settings:                      │
│ ☒ 1. Startup music.    Green Force Name: │
│ ☒ 2. Bugle Alert.      ┌───────────────┐ │
│                        │US             │ │
│ Settings for this game only:  └──────┘  │
│ ☐ 3. Arty smoke defeats thermal sights.  │
│ ☐ 4. Vehicle smoke grenades defeat thermal sights. │
│ ☒ 5. All OPFOR tanks have thermal sights.│
│ ☒ 6. All OPFOR ATGMs have thermal sights.│
│ ☒ 7. Improved OPFOR ATGM warheads.       │
│ ☒ 8. Firing Units Are Always Spotted.    │
│ ☐ 9. No Enemy OOB Reports.               │
│ ┌──────┐                                 │
│ │4000  │ 10. Max Normal Visibility In Meters. │
│ └──────┘                                 │
│ ┌──────┐                                 │
│ │4000  │ 11. Max Thermal Visibility In Meters. │
│ └──────┘                                 │
│ ┌──────────────────┐ ┌──────┐ ┌────────┐│
│ │Restore Factory Defaults│ │ OK │ │ Cancel ││
│ └──────────────────┘ └──────┘ └────────┘│
└─────────────────────────────────────────┘
```

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.

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

The default name and nationality of the force of green markers in TacOps is US.   Changing the "Green Force Name" will substitute a name of your choice for the letters "US" in most game windows.   You may enter up to 15 characters, however some windows will only use the first two.   The effect is purely cosmetic.   Game logic and functioning is not altered in any way by changing the name of the green force. Changes to this item will effect the current game session and will carry forward to any new game session.

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.

14.1.2 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.

14.1.3 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.

14.1.4 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.

14.1.5 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.

14.1.6 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 or OPFOR nomenclature conventions.

14.1.7 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. Checking this preference adds significant realism to TacOps play, but it may be disconcerting to some gamers

14.1.8 Max Normal Visibility In Meters.

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

14.1.9 Max Thermal Visibility In Meters.

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

14.2 Game Options

Game options are selected through 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.

14.2.1 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.

14.2.2 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.

14.2.3 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. When the timer expires the next combat phase starts automatically. This option is available at any time.

14.2.4 Change Password

Select the Options/Change Password menu item to add or change an orders and unit visibility security password.   This feature is only relevant to games played between two human opponents. Warning: if you forget your password you will not be able to reload any saved game that uses it.   This option is available at any time.

14.2.5 Add One Unit.

Select the Options/Add One Unit menu item to display a window that will allow you to 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:" and then double click on the desired unit in either the US & Canada 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. 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.

```
                         Add Unit
US & Canada            Quantity to Add:    OPFOR
155mm SP Hwtzr    ▲                       122mm SP Hwtzr    ▲
60mm Mortar P3    □          14           152mm SP Hwtzr    □
81mm Mortar P7                            2S 120mm Mortar
AAV7 APC                 Double click in list to   2S22 120mm SP Mortar
AH1 Cobra                add a unit.       AGS17 Team P3
AH64 Apache AT                            AT4 ATGM Spigot P3
AH64 Apache GP                            AT7 ATGM Saxhorn P2
CH46 Helo                                 BM21 MRL
CH47 Helo                Adding units to   BMD1 IFV
CH53 Helo                OPFOR in a solitaire  BMP1 IFV
Command Element [-] P    game may cause    BMP2 IFV
Command Element P8       undesired behavior  BMP3 IFV
Corpsman P1             from the computer   BRDM2 APC
Dragon2 ATGM P2         opponent.          BRDM2 AT
HMMWV                                      BTR80 APC
HMMWV Air Defense                         BTR90 APC
HMMWV AT                                  Command Element [-] P4
HMMWV Mortar Carrier  ▼  ^ = Canadian     Command Element P8  ▼
```

14.2.6 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. To use, select the Options/Add Optional Units US   or the Options/Add Optional Units OPFOR 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.   OPFOR units added to solitaire games through this feature will be properly controlled by the computer opponent.

14.2.7 Change Air Support.

Select the Options/Change Air Support menu item to change the number of air support sorties available at the beginning of any scenario and to change the percentage chance of the US and or OPFOR receiving additional air missions at the begining of each new orders phase.   This option is only available during the first orders phase.

14.2.8 Change Artillery Support.

Select the Options/Change Artillery Support menu item to set the type of artillery support available in a scenario, to change the number of available artillery fire missions, to change artillery mission ammunition available for those missions, and to change the percentage chance of the US and or OPFOR receiving additional artillery ammunition at the begining of each new orders phase. This option is only available during the first orders phase.

14.2.9 Change Entry Time.

Select the Options/Change Entry Time US or the Options/Change Entry Time OPFOR menu item to display a window that will allow you to 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.

Change Entry Time

Armored Cavalry Troop:

Entry time for leading unit: `0720` `<< Set It` `Next`
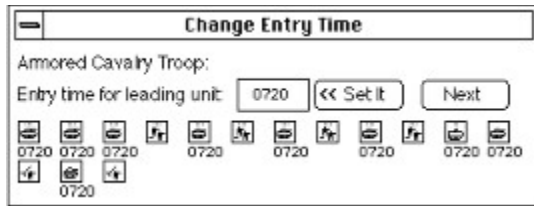
14.2.10 Change Exit Goal

Select the Options/Change Exit Goal menu item to 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.

14.2.11 Change Game Length.

Select the Options/Change Game Length menu item to 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 OPFOR setting to match that used by the US player.

14.2.12 Change Supply

Select the Options/Change Supply menu item 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.

14.2.13 Change Units & Weapons.

Select the Options/Change Units & Weapons menu item to present a window with menu lists of weapons or unit modifications and exchanges. 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.

Note to Canadian users.   This menu item is the primary gateway to converting US oriented scenarios to Canadian units and equipment.   Units and equipment unique to Canada will be preceded in the window lists by   "CN".   Use the Canada Tables of Organization in Appendix B TO&E of the printed Users Guide as a guide for the appropriate exchanges.   The exchange process will not automatically produce perfect representations of real world Canadian 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 unit.

14.2.14 Delete Units.

Selecting Options/Delete Units menu item allows you to delete units without penalty.   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. Useful when only a part of startup or optional units is wanted or for recovering from mistakes such as adding the wrong optional units.

14.2.15 Ignore Unit Setup Limits.

Selecting the Options/Ignore Unit Setup Limits menu item allows you to setup your units 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.

15 Play On A Network

The most exciting and most realistic way to play TacOps is to connect two players on a network. In order to play a game using networked computers, the computers must either (1) already be active on a local area network (LAN) or (2) be collocated and connected by a serial/null modem cable.   The next few paragraphs provide an overview of how TacOps network play works.   Detailed setup instructions for using the network LAN mode and the serial mode will be found in later sections.

The network procedures for TacOps were still in testing when this guide was written.   Be sure to check the "readme.txt" file in your TacOps directory before trying a network game for the first time.   The file may contain change information and or useful hints for network setup and game play.

The LAN and the serial network modes both   use a shared directory - sometimes called a shared folder - to transfer orders between the players much like a play by mail game, except that the transfer is done automatically.   Once both players have selected the same shared directory, their computers communicate with each other only when required - communication could occur as little as three times per complete orders/combat turn.   When one computer needs to communicate game information to the other, that computer writes a file to the shared directory.   Often that file will contain nothing more than one number, other times it might contain a string of characters, and once per turn it will be fairly large and will contain a player's orders to his units.   Depending on the purpose of the communication, the file will be named netfile.grn, netfile.red, ordfile.grn, or ordfile.red.   Each computer will check about once per second (if it is not doing anything more important) for the appearance in the shared directory of a file with one of these names.   The US computer will check for files named netfile.red or ordfile.red.   The OPFOR computer will check for files named netfile.grn or ordfile.grn.   When a file with the appropriate name appears, then the computer will pause to read the file, delete the file, and then take whatever action is appropriate.

An example of a typical communications load for one orders/combat turn follows.   Player A is US. Player B is OPFOR.

Orders phase - both players are busily and simultaneously engaged in giving orders to their units.   Player A decides to tease player B.   Player A brings up the communications window and types in "I hope your guys have got their flack jackets on!", hits the transmit button, closes his communications window (or not) and goes back to giving orders to his units (or not).   At the same time his computer will write a netfile.grn file to the shared directory containing that message.   Player B's computer will quickly notice that netfile.grn has appeared in the shared directory, it will read the file, delete the file, automatically open a communications window if one is not already open, and then display on player B's screen the message "I hope your guys have got their flack jackets on!".   If player B then types in a suitable retort, his program will send it as a message file back to Player A.   The process is the same for Player B except that his chat file will be named   "netfile.red".

Player A finishes his orders and selects Begin Combat (note that the player sequence does not matter, it could just as easily be Player B who finishes his orders first).   Although combat will not begin immediately, he is now locked out from giving any more orders.   His program automatically writes his orders to the shared directory as ordfile.grn.   His program also automatically writes a netfile.grn to the shared directory containing only a code number.   Player B's program initially ignores the arrival of ordfile.grn but it immediately senses the arrival of netfile.grn, reads and deletes netfile.grn, and puts an alert on Player B's screen saying "Enemy commander has finished his orders.".   Player A begins to twiddle his thumbs.

Player B finishes his orders and selects Begin Combat - again combat will not begin immediately, and he is also now locked out from giving any more orders.   His program automatically writes his orders to the shared directory as ordfile.red.   His program also automatically writes a netfile.red to the shared directory.   Player A's program initially ignores the arrival of ordfile.red but it immediately senses the arrival of netfile.red, reads and deletes netfile.red, and puts an alert on Player A's screen saying "Enemy commander has finished his orders."

In a second or two, both computers will realize that both players have now finished giving their orders. The US computer will then read and delete ordfile.red.   At the same time (more or less) the OPFOR computer will read and delete ordfile.grn.   Both computers will then automatically execute a simultaneous (more or less) combat phase in accordance with both players orders.   As each computer finishes the combat phase it will place a netfile.red or a netfile.grn in the shared directory that will result in the message "Enemy commander has finished combat." being displayed on his opponent's screen.

Once both computers realize that the other has finished executing the combat phase then both players will be allowed to give orders again and the cycle is repeated.

15.1.1 Network Setup - LAN

The network procedures for TacOps were still in testing when this guide was written.   Be sure to check the "readme.txt" file in your TacOps directory before trying a network game for the first time.   The file may contain change information and or useful hints for network setup and game play.

TacOps depends on your LAN already being active and on it providing a certain level of file access and service.   Your LAN must allow two users to read from, write to, and delete files from a shared directory. Before running TacOps, do your normal procedures to log onto your network and to establish a user access level that allows you to use a shared directory.   If the required procedures are unfamiliar to you, consult the documentation that came with your LAN equipment, your LAN software, your LAN account information package, or your LAN administrator.

15.1.2 Establish Game Connection - LAN

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

The Startup Window should disappear and you will be asked via a standard file selection dialog to select a directory somewhere on the network that can be shared with your opponent - depending on the type of network being used this directory could be on a server, or on your computer, or on your opponent's computer.

15.1.3 Play the game - LAN

Once a shared directory has been specified, the game will proceed as for other methods of play. You and the enemy commander will be able to simultaneously select a scenario or saved game to load, setup any new units, add option forces, set preferences, and give orders to your respective forces.   It would be a good idea to send a chat message to the enemy commander as early in the setup process as possible to confirm that the network is functioning properly and that you have both selected the same shared directory.   If you can not exchange chat messages then you will not be able to exchange orders either.

When you have finished giving orders to you units. Select the Combat/Begin Combat Phase menu item. Your computer will automatically post a message on the screen of the enemy commander stating that you have finished giving your orders. When the enemy commander has finished giving his orders, you will be notified with a message on your screen.   Once both computers note that both commanders have selected Combat/Begin Combat Phase, they will exchange orders. Messages will appear at the bottom of your screen showing the progress of the orders exchange. Avoid doing any screen, mouse, or keyboard activities while an orders exchange is in progress. Preferences will be automatically checked at the beginning of the first orders exchange. If critical preference settings do not agree on both computers, an error message will be sent to both players and corrective action will be taken. 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.

Once the orders have been successfully exchanged, the combat phase will then automatically begin and will execute simultaneously on both computers.

When the combat phase has finished on your computer, a message will be automatically sent notifying the enemy commander of this. When the combat phase has finished on the enemy commander's computer, you will similarly be notified. If there is a marked difference in the computing power of the two computers, the more powerful computer is likely to finish the combat phase well before the other. The combat results will be the same, it just takes the less powerful computer longer to process the action. Once both computers note that the combat phase has finished on both computers, each player will be able to again give orders to his unit.

Repeat the orders/combat phase cycle.

Caution: Do not drop off the game net without first coordinating saving the game with the other player. If you decide to interrupt a game and quit, be sure to wait until both computers have finished any in progress combat phase. As soon as the combat phase has finished on both computers, both players should immediately save their game and then quit the program. When you wish to resume the game, follow the usual procedures for starting TacOps on a network.

Caution: When playing on a network, 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 during the orders exchange process, you will be shown an alert dialog telling you what the differences are.   If you are the US player the program will then change the incoming OPFOR orders to match your preferences settings.   If you are the OPFOR player the program will then change your game preferences to the settings of the US player.

15.1.4 Network Chat - LAN

You may send text messages to the enemy commander by selecting the Comms/Send A Message menu item. Avoid sending messages while the computers are exchanging orders. On rare occasions, the enemy commander may be doing something that is incompatible with receiving chat messages. If so you may not get an immediate response to a message. Don't worry, the message will be received as soon as the enemy commander starts a different activity .

15.1.5 Network Problems - LAN

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.tac" . The save is triggered by selecting the Combat/Begin Combat menu item. Should you experience fatal network problems, you will usually be able to restart the game by using this file.

If there is a network problem during game play, the program will often notify you. If a net error has created a fatal game problem, the program will tell you so. If the problem is reported as fatal, immediately save the game, then exit and restart the program. If the problem was not reported to be fatal, you may be able to reestablish a good connection by selecting the Comms/Reset Comm Link menu item. If this does not help on the first try, have the enemy commander also select the Comms/Reset Comm Link item on his computer. If necessary do this several times on both computers. If all attempts to reset the network fail, both commanders should try to save the game, then both should exit and restart the program using either the autosave.tac file or another saved game file.

15.2.1 Network Setup - Serial
The serial network procedures for TacOps were still in testing when this guide was written.   Be sure to check the "readme.txt" file in your TacOps directory before trying a serial network game for the first time. The file may contain change information and or useful hints for serial network setup and game play.

Install a serial/null modem cable link between the serial communications ports of your two collocated computers.   The TacOps default is to use the Com2 port, but you may change this with the Comms/Change Port menu item.   The exact nature of the cables and connectors that make up the physical connection varies across different brands and ages of computers.   In general the link will consist of one of the following.   One end of a serial null modem cable connected to a communications port of computer A and the other end connected to the communications port of computer B.   Or a serial cable connected to a communications port of computer A plus a serial cable   connected to a communications port of computer B, and both serial cables meeting at a serial null modem adapter.

15.2.2 Establish Game Connection - Serial

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

The Startup Window should disappear .   You may or may not be asked via a standard file selection dialog to select a directory on your computer to hold temporary disk files that will be used in connection with the exchange of chat messages and orders files.   If you are not asked to select a directory, it means that TacOps was able to choose one for you - probably the same directory in which tacops.exe resides.

15.2.3 Play the game - Serial

Once the setup and initial startup sequence is completed, the game will proceed as for other methods of play. You and the enemy commander will be able to simultaneously select a scenario or saved game to load, setup any new units, add option forces, set preferences, and give orders to your respective forces. It would be a good idea to send a chat message to the enemy commander as early in the setup process as possible to confirm that the serial link network is functioning properly.   If you can not exchange chat messages then you will not be able to exchange orders either.

When you have finished giving orders to you units. Select the Combat/Begin Combat Phase menu item. Your computer will automatically post a message on the screen of the enemy commander stating that you have finished giving your orders. When the enemy commander has finished giving his orders, you will be notified with a message on your screen.   Once both computers note that both commanders have selected Begin Combat Phase, they will exchange orders. Messages will appear at the bottom of your screen showing the progress of the orders exchange. Avoid doing any screen, mouse, or keyboard activities while an orders exchange is in progress. Preferences will be automatically checked at the beginning of the first orders exchange. If critical preference settings do not agree on both computers, an error message will be sent to both players and corrective action will be taken. 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.

Once the orders have been successfully exchanged, the combat phase will then automatically begin and will execute simultaneously on both computers.

When the combat phase has finished on your computer, a message will be automatically sent notifying the enemy commander of this. When the combat phase has finished on the enemy commander's computer, you will similarly be notified. If there is a marked difference in the computing power of the two computers, the more powerful computer is likely to finish the combat phase well before the other. The combat results will be the same, it just takes the less powerful computer longer to process the action. Once both computers note that the combat phase has finished on both computers, each player will be able to again give orders to his unit.

Repeat the orders/combat phase cycle.

Caution: Do not drop off the serial link without first coordinating saving the game with the other player. If you decide to interrupt a game and quit, be sure to wait until both computers have finished any in progress combat phase. As soon as the combat phase has finished on both computers, both players should immediately save their game and then quit the program. When you wish to resume the game, follow the usual procedures for starting TacOps on a serial link.

Caution: When playing on a serial link, 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 during the orders exchange process, you will be shown an alert dialog telling you what the differences are.   If you are the US player the program will then change the incoming OPFOR orders to match your preferences settings.   If you are the OPFOR player the program will then change your game preferences to the settings of the US player.

15.2.4 Network Chat - Serial

You may send text messages to the enemy commander by selecting the Comms/Send A Message menu item. Avoid sending messages while the computers are exchanging orders. On rare occasions, the enemy commander may be doing something that is incompatible with receiving chat messages. If so you may not get an immediate response to a message. Don't worry, the message will be received as soon as the enemy commander starts a different activity .

15.2.5 Network Problems - Serial

Using the TacOps Auto Save feature is highly recommend for serial link 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.tac" . The save is triggered by selecting the Combat/Begin Combat menu item. Should you experience fatal link problems, you will usually be able to restart the game by using this file.

If there is a link problem during game play, the program will often notify you. If a link error has created a fatal game problem, the program will tell you so. If the problem is reported as fatal, immediately save the game, then exit and restart the program. If the problem was not reported to be fatal, you may be able to reestablish a good connection by selecting the Comms/Reset Comm Link menu item. If this does not help on the first try, have the enemy commander also select the Comms/Reset Comm Link item on his computer. If necessary do this several times on both computers. If all attempts to reset the link fail, both commanders should try to save the game, then both should exit and restart the program using either the autosave.tac file or another saved game 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 US player the program will then change the incoming OPFOR orders to match your preferences settings.   If you are the OPFOR player the program will then change your game preferences to the settings of the US 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 US or the OPFOR 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 US. 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 US or the OPFOR 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

```
File
About the Scenario...
New Game...          Ctrl+N
Save Game...         Ctrl+S
Auto Save Game
PBM Send Orders...
PBM Receive Orders...
Quit                 Ctrl+Q
```

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

New Game quits the current game and offers the opportunity to load a new scenario without quitting the program.

Save Game saves the current game to disk.

Auto Save Game causes the current game to be saved to disk automatically at the beginning of each combat phase. The file name used is "autosave.tac".

PBM Send Orders saves your 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 your opponent's unit orders and game situation from a disk file during a play-by-mail game or play-by-email game.

Quit closes TacOps and returns to the Windows Program Manager.

17.2 The Combat Menu

```
Combat
  Begin Combat Phase...  Ctrl+B
  Do Game Run Out...
```

Begin Combat Phase ends the current orders phase and starts the combat phase.

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.

Stop Game Run Out restores normal game functioning during a game run out. Shortcut - touching any key will also stop a game run out.

17.3 The Orders Menu

Do US Unit Orders specifies which force is currently able to give orders to its units. Only relevant or used when the game is played by two players on one computer.

Do OPFOR Unit Orders specifies which force is currently able to give orders to its units. Only relevant or used when the game is played by two players on one computer.

Artillery Support allows you to target and control off map artillery fire missions.

Air Support allows you to target and control air support missions.

Copy Orders and Paste Orders allow you to copy 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 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 "Control+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 "Control+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 Orders Window.   The keystroke sequence of "Control+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 allow 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 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 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.

Weapons On/Off allows you to set the engagement range of a selected unit or group of units to either zero or maximum range.   To set the engagement range of one or more units, select one or more units by

shift clicking on unit markers or by dragging a selection rectangle around them.   Then select the Weapons On/Off 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 Weapons On/Off menu item without any unit selected on the map, you will be prompted to click on a unit to set its engagement range.

Go To Unit will open the Orders Window of the unit having the ID number specified in a subsequent dialog. If necessary the screen will scroll to the unit to make sure it is visible. Mainly useful for locating units listed in an ammo report as being low on ammo. Select this item, then enter the unit ID number of a unit. If the unit is on the map, its Orders Window will be opened. If the unit is loaded aboard an APC or a tank, the carrying unit's 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 effected in any way by settings in this menu.

```
Map
  Change Unit Symbol Size  Ctrl+1
  Change Unit Symbol Info  Ctrl+2

  Hide Units With Orders
  Hide Units With Checks
  Hide All Units           Ctrl+H

  Redraw Map               Ctrl+R
  View Terrain             Ctrl+T
  Line of Sight Check      Ctrl+L
  Thermal LOS Check

  Show Scroll Bars
  Show 1000m Grid
  Show Grid Coordinates
  Show Situation Map...    Ctrl+M

  Plot Fire Support
  Plot Target Ref Points
  Plot Mission Objectives
  Plot Minefield Lanes
  Plot Wrecks
  Clear Wrecks
```

Change Unit Symbol Size cycles the unit display symbols through several sizes Symbol size does not effect game logic. If you experience computer low memory problems you should avoid using the larger symbols.

Change Unit Symbol Info switches the unit display symbols in turn to silhouette, disposition/facing, or orders status. Done repeatedly, will cycle through all three views.

Hide Units With Orders temporarily 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.

Hide Units With Checks temporarily hides from view all friendly units that have had their 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.

Hide All Units temporarily 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 allows you to check 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 allows you to check 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 grid on the map with squares 1000 meters wide and 1000 meters tall.

Show Grid Coordinates draws a grid on the map with squares 1000 meters wide and 1000 meters tall and labels the boundaries of the squares with Universal Transverse Mercator (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 miniature map showing the location of all visible units. Some scenarios do not offer a miniature map.   Clicking on the miniature map will automatically close the window, and the battle map will scroll if necessary so that the same relative point is visible.

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 your units.   This item is only available during the orders phase and if on is automatically turned off at the start of a combat 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.

17.5 The Reports Menu

```
Reports
  Games Status...
  Order of Battle...

  Ammo Report Long...
  Ammo Report Short...

  Unit Data Base...
  Weapon Data Base...
  Photo Data Base...

  Unit Info...          Ctrl+I
```

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 .

Ammo Report Long reports the current ammunition supply for all your units. Units having ten or less percent of their basic load for any weapon will be highlighted with a special character. Note the unit ID number of units of interest and use it in combination with the Orders/Go To Unit menu item to open the orders window for that unit.

Ammo Report Short reports the current ammunition supply only for those of your units that have ten or less percent of their basic load for at least one weapon. Note the unit ID number of units of interest and use it in combination with the Orders/Go To Unit menu item to open the orders window for that unit.

Unit Data Base allows you to view detailed information on most units in the TacOps data base.

Weapon Data Base allows you to view detailed information on most weapons in the TacOps data base.

Photo Data Base allows you to view photographs of most units and weapons in the TacOps data base.

Unit Info changes the cursor to a cross hair. Subsequent clicking on a unit on the map will produce a text information window on that unit.   If the unit clicked on is an enemy unit, some information items will not be shown.

17.6 The Comms Menu

```
┌─────────┐
│ Comms   │
├─────────┴────────┐
│  Send A Message... │
│  Reset Comm Link   │
├────────────────────┤
│  Change Port       │
└────────────────────┘
```

The Comms Menu is only available during games played in network mode.

Send A Message allows you to chat with (taunt?) the enemy commander.

Reset Comm Link relogs your computer onto the network as a TacOps player and deletes any wayward game communication files. Useful for recovering from inexplicable network errors.   Use this item only as a last resort.

Change Port allows user to change the communication port used by TacOps for serial network play.

17.7 The Setup Menu

The Setup Menu is only available during the orders phase.   Its menu items were originally provided only to support the adjustment of units shown in a Setup Window and on the map during the first setup/orders turn of a game.   However, due to many user requests this menu now remains active in all subsequent orders phases.

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.

Unload Unit unload 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.

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 like units 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.

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 "Control" key. This inconsistency is outweighed by the great convenience and setup speed that these four hot keys provide the experienced user.

17.8 The Options Menu

The Options Menu allows you to modify certain game, scenario, weapon, and unit characteristics. Most options are only available during the orders phase of the first game turn.   Most of the items in the Options menu are only available during the first orders turn or setup phase of a new game.   Some of the items are intended primarily 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".

```
 Options
   Set Volume...
   Preferences...

   Change Combat Speed [X]...
   Change Fog-Of-War...
   Change Orders Time Limit...
   Change Password...

   Add One Unit...                   Ctrl++
   Add Optional Units US...
   Add Optional Units OPFOR...
   Change Air Support...
   Change Artillery Support...
   Change Entry Time US...
   Change Entry Time OPFOR ...
   Change Exit Goal...
   Change Game Length...
   Change Supply...
   Change Units & Weapons...
   Delete Units...                   Ctrl+X
   Ignore Unit Setup Limits
```

Set Volume sets the sound effects volume level. Also allows the substitution of a quiet click for all sound effects. Changing sound volume or sound type is a permanent setting for future TacOps play. The change will be remembered from game to game, even after cold restarts.

Preferences presents a window which allows you to alter certain game, unit, and weapons characteristics. Preferences tend to include those game option settings that are controversial.

Change Combat Speed allows you 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.

Change Fog-Of-War allows you to choose between realistically limiting screen display only to legally spotted units or to unrealistically display one side's forces to the other at all times.

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. Might be useful for public competition play.

Change Password allows you to change or add anti-snooping password protection in two player games.

Add One Unit allows you to add one unit marker at a time to either side's order of battle.

Add Optional Units US adds user selected additional units to the US order of battle.

Add Optional Units OPFOR adds user selected additional units to the OPFOR order of battle.

Change Air Support allows you to alter the air support available in the scenario.

Change Artillery Support allows you to alter the off map artillery support available in the scenario.

Change Entry Time US allows you to change the map entry times of US units that begin a game off map.

Change Entry Time OPFOR allows you to change the map entry times of OPFOR units that begin a game off map.

Change Exit Goal 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.

Change Game Length resets the official end of game time.

Change Supply allows you to increase or decrease the resupply points available during a scenario to a given force.

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.

Delete Units removes user selected units from the US and OPFOR order of battle.

Ignore Unit Setup Limits allows you to setup your units without regard to any normal scenario unit placement restrictions.

18 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.

18.1 Creating Custom Scenarios

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.

18.2 Sharing Custom Scenarios

Computer game owners have on occasion been caused considerable consternation and inconvenience in connection with playing their games using national and local information services. Understandable company concerns with protecting their product from piracy and other lesser forms of infringement seemed to be somewhat at odds with the users' desires to extend their community of opponents. The purpose of this section is to clear the way for you to use TacOps outside the limits of your own home. Unfortunately, the path to freedom must be pocked with a lot of extra verbiage.

Simply put, you can exchange or share "TacOps orders files" and "TacOps saved game files" in any way you want as long as your only reward is game play. Custom scenarios that you create are just another form of a "TacOps saved game file". You may not rightfully exchange or share any of the factory provided TacOps game components under any circumstances.

For example, you can run TacOps, load a scenario or a custom scenario template, modify it using the usual options and then save the result in the form of a saved game file. You may give a copy of that saved game file to a gaming associate but you may not give over a copy of the TacOps program, nor the companion TacOps scenario file, nor the TacOps map file needed for your associate to play your saved game file. Obviously we expect your associate to purchase the later items from a legitimate retailer.

Less simply put...

A "TacOps orders file" is a computer disk file created by selecting the "PBM Send Orders" menu item in the File menu of the TacOps game program.

A "TacOps saved game" is a computer disk file created by selecting the Save Game menu item in the File menu of the TacOps game program.

A "TacOps user created custom scenario" is a computer disk file created by selecting the Save Game menu item in the File menu of the TacOps game program.

Registered Owners of the TacOps program are free to exchange "TacOps orders files", "TacOps saved games", and "TacOps user created custom scenarios" with other Registered Owners of the TacOps program by any means as long as there is no remuneration or compensation whatsoever involved in the exchange.

Registered Owners of the TacOps program are free to place "TacOps orders files", "TacOps saved games", and "TacOps user created custom scenarios" into public or private download and or email areas of national and local computer information services (computer BBSs) as long as there is no remuneration or compensation whatsoever involved in the placement.

Any TacOps game component that is not mentioned above may not be exchanged or distributed in any manner by anyone without express written permission from Arsenal Publishing.   For example, you may not exchange or distribute TacOps scenario files or TacOps map files.

19 GENERAL NOTES

19.1 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: Ammo Report Long or Reports: Ammo Report Short menu items. All units will be listed in the long report, but those having ten or less percent of their basic load for any weapon will be highlighted with a special character. The short report lists only those units having ten or less percent of their basic load for any weapon. Note the unit ID number of units of interest and use it in combination with the Map: Go To Unit menu item to open the orders window for that unit.

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.

19.2 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.

19.3 Terrain Scale

One screen pixel equals ten meters.   A screen pixel is normally the amount of screen covered by a plain style period character.

19.4 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.

19.5 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.

19.6 Color, Memory, and Speed

TacOps is optimized for 16 and 256 color modes. The game will run at monitor settings greater than these, but the graphics will not be any different, much more memory will be required, and the game may slow unacceptably during the combat phase.

19.7 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.

19.8 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.
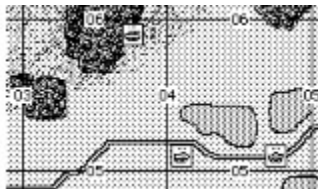
 If you only use four numbers to indicate map location, the center of the tank unit is located in or at grid 03 05. READ RIGHT UP - start in the lower left corner of the map and read right to easting line 03, then read up to northing line 05. The AAV7 unit and the LAV25 unit are both located in or at 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.
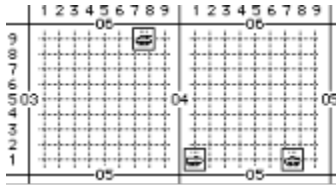
Notice that the 1000 meter squares have been divided so that there are now 10 easting lines and 10 northing lines inside each 1000 meter square.   Now you can use six numbers to locate a unit on the map. The tank unit can now be said to be located at grid 037 059. Start in the lower left corner of the 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.

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. Most of the information windows use basic black and gray 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.   Rapidly and smoothly animating several hundred independently acting small objects in thousands or millions of colors is presently (1996) only feasible on new computers or on high end older machines. 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.

I have gotten some criticism for the small amount of white flash that is displayed at the map edges when the map is scrolled. White flash seems especially to be a standard performance yardstick or peeve of some magazine critics. I tried a lot of approaches to scrolling the map. Several exhibited no white flash - even on older machines. These approaches also either required a prohibitive amount of computer memory, or required several seconds of off screen processing before the screen actually moved. There is a lot of screen scrolling in TacOps and frankly I am an impatient guy. When I touch a key or button it is because I want to go somewhere and do something - I want to get on with the game. Accordingly I chose to use the routines that gave me instant screen movement.

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 - for example the tank retrievers can not actually move disabled tanks -

and they seldom if ever 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 certain carefully limited 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 desperately 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. 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 areas: 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.

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 US. 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.

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