



# Mission Editor Manual

This Mission Editor tool is a proprietary tool designed specifically to create missions for NovaLogic's games. Since each game has different requirements and variables, the Mission Editor is constantly undergoing changes to best fit the current project. This manual covers the mission editor for Delta Force - Xtreme. We will walk you through the process of setting up a mission, populating it with objects and enemies, and setting complex trigger statements.

It is highly recommended that you walk through this manual in the order that it is written. Many functions will work only if the proper groundwork has been properly laid.

The Mission Editor Tool requires a minimum screen resolution of 800x600. For best results, we recommend that you set your resolution to at least 1024x768. It is also recommended that you have at least 160 Megs of memory free when using the tool.

Please note that MED is provided as is, and any existing bugs in it will unfortunately not be addressed. If there are bugs in it which prove to be a major inconvenience we recommend downloading and using our latest mission editor, NILE, available at [www.novalogic.com](http://www.novalogic.com). For questions that are not answered here, we recommend visiting the Novaworld forums: [www.novaworld.com](http://www.novaworld.com)

One such bug to be aware of follows:

*When pitching and or rolling an object, there is a graphical rendering bug that will cause pitched and or rolled objects to render incorrectly in 2D mode. They will however render correctly in 3D mode. Unfortunately, this bug is not scheduled to get fixed. If it is a major inconvenience, then we suggest using NILE, which is available for download from [www.novalogic.com](http://www.novalogic.com).*

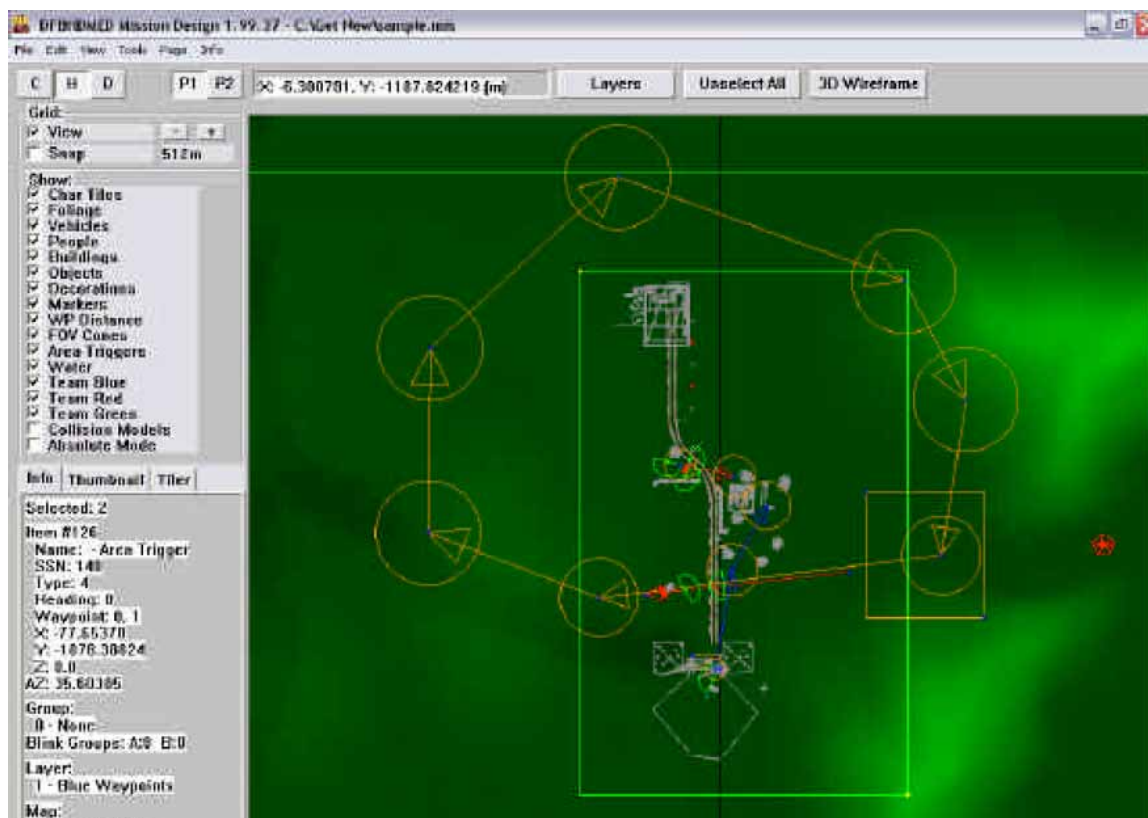
**DISCLAIMER:** This Mission Editor Tool is provided to the consumer "AS IS". NovaLogic technical support will not be able to answer any questions about this product or any issues related to its use.

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# Section 1: Navigating the Tool

There are a number of keyboard controls and toolbar buttons that will help you work more efficiently. Many functions are mirrored in the pull down menus, but learning the key commands will prove to be more useful.



If you want to try out some of these commands, open the sample mission by clicking **File** then **Open** and select “Sample.mis”. This will bring up a sample map and some objects.

## Mouse Commands:

**Left Mouse** – Selects or unselects an item in Select Mode or inserts a new item when in Insert Mode. You can left click on the **Unselect All** button or you can hit the **U** key to unselect everything. You can select more than one item at a time by moving the mouse near another target and clicking on it. Items turn yellow when selected.

The attributes of the most recently selected item will appear in the window in the lower left side of the screen. While an item is selected you can left click on the Selected Information Box in the left corner to pull up the Item Attributes window. Clicking on the **Thumbnail** tab will bring up a window showing an image of the selected item.

**Left Mouse** with **SHIFT** held down – Selects everything within the box you create.

**Left Mouse** with **CONTROL** held down – Unselects everything within the box you create.

**Right Mouse** – If you have one or more objects selected, you will get menu A. If you have no objects selected, you will get Menu B.

### Selected Item Menu:

- **Edit Item Attributes** – Brings up the window where you can adjust all of the item variables.
- **Move** – Any items selected can be dragged to another location onscreen.
- **Numeric Move/Copy** – Allows you to move or copy the selected items to a specific coordinate on the map.
- **Group Rotate** – Selected items can be rotated around a central point by inputting the angle (0 is north)
- **Hide Selected** – Hides all objects that are currently selected and then unselects those objects.
- **Hide Unselected** – Hides all objects that are currently unselected and then unselects those objects.
- **Unhide All** – Unhides all objects that are currently hidden.
- **Select This Type** - Selects all of the current type of the last item selected.
- **Select This Group** - Selects all of the current members of the group of the last item selected.
- **Select this Waypoint List** - Selects all members of this waypoint list, markers, vehicles and AI.
- **Deselect This Type** – Unselects all of this type where this type is the type of the last object selected.
- **Deselect This Group** – Unselects all of the last selected Group members.
- **Deselect This Waypoint List** – Unselects all of the last selected waypoint list.
- **Snap To Grid**– Any selected objects will immediately move to the nearest grid intersection.
- **Snap to Terrain** – Snaps the object's ground point to the terrain. The key shortcut is also useable in 3d mode.
- **Snap to Water** – Snaps the object's ground point to the water. The key shortcut is also useable in 3d mode.
- **Delete Selected** – Removes the currently selected objects from the map.

Edit Item Attributes...	Enter
Move	
Numeric Move...	
Group Rotate...	
Hide Selected	S
Hide Unselected	Shift+S
Unhide All	A
Select This Type	T
Select This Group	G
Select This Waypoint List	W
Deselect This Type	Shift+T
Deselect This Group	Shift+G
Deselect This Waypoint List	Shift+W
Snap to Grid	Ctrl+Shift+G
Snap to Terrain	Ctrl+Shift+T
Snap to Water	Ctrl+Shift+W
Delete Selected	Delete

### Insert Menu:

- **Insert Mode** – When you enter Insert Mode, and click on the map, you will bring up the Insert Item window. The object you select here will be placed when you press the OK button.
- **Depth Pixel Mode TEXT** – This is no longer used.
- **Toolbar TEXT** – This is no longer used.
- **Paste** – If you have an item copied, you can paste multiple copies of it into the map.
- **Unhide All** – Unhides all hidden objects.
- **View By Layer** – Makes all items that are on a layer their own color. Actually, we only have 17 colors to choose from, so layers 17-32 will all appear as orange.

Insert Mode	Insert
Depth Pixel Mode TEXT	
Toolbar TEXT	
Paste	
Unhide All	
View by Layer	
✓ View by Type	
View by Side	
Exit Program	

- **View By Type** – Makes all items of the same type the same color. e.g. People will be green, vehicles red, decorations gray, etc.
- **View By Side** – Turns all objects the color of their respective blue, red or green (neutral) teams.
- **Exit Program** – Exits DFXMED.exe

**Right Mouse** with **SHIFT** held down – Quickly zooms in and out of the map. Click and hold the mouse button then move the mouse right or left to quickly zoom in and out of the map.

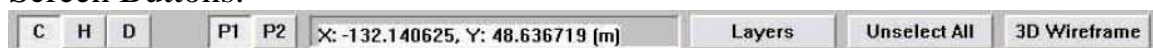
**Right Mouse** with **CONTROL** held down – Centers the map on the point you click.

### Keyboard Commands:

- **Keypad 2,4,6,8** (With Number Lock ON)- Scrolls map down, left, right and up respectively.
- **Page Up, Keypad 9, or Keypad Plus** - Zooms map in.
- **Page Down, Keypad 3, or Keypad Minus** - Zooms map out.
- **INSERT** - Toggles between Insert Mode and Select Mode.
- **DELETE** - Deletes selected items.
- **ALT** – Hold to use hotkey listed in the toolbar menu. For example, pressing **ALT + E** pulls down the Edit Menu. After that, pressing **ALT + I** will open the General Information window.
- **ARROW KEYS or NUMPAD DIRECTIONAL KEYS** (when Number Lock is OFF) - Moves the objects you currently have selected in 1/256 meter increments.
- **ARROW KEYS with CONTROL or NUMPAD DIRECTIONAL KEYS** (when Number Lock is OFF) with **CONTROL** - Moves objects in 1 meter increments.
- **LEFT AND RIGHT ARROW KEYS with SHIFT or NUMPAD DIRECTIONAL KEYS** (when Number Lock is OFF) with **SHIFT**– Rotates the selected object 1 degree. If you have more than one object selected, they will rotate around a point most centered from all selected objects.
- **LEFT and RIGHT ARROW KEYS with SHIFT and CONTROL or NUMPAD DIRECTIONAL KEYS** (when Number Lock is OFF) with **SHIFT and CONTROL** – Rotates the selected object 30 degrees. If you have more than one object selected, they will rotate around a point most centered from all selected objects.
- **UP and DOWN ARROW KEYS with SHIFT** – Raises and lowers the object in 1/256 meter increments.
- **UP and DOWN ARROW KEYS with SHIFT and CONTROL** – Raises and lowers the object in 1meter increments.
- **+/-** adjusts pitch in 1 degree increments.\*\*
- **CONTROL** and **+/-** adjusts pitch in 30 degree increments.\*\*
- **SHIFT** and **+/-** adjusts roll in 1 degree increments.\*\*
- **CONTROL** and **SHIFT** and **+/-** adjusts roll in 1 degree increments.\*\*
- **U** - Unselects all selected items

*\*\*(Note: when pitching and or rolling an object, there is a graphical rendering bug that will cause pitched and or rolled objects to render incorrectly in 2D mode. They will however render correctly in 3D mode. Unfortunately, this bug is not scheduled to get fixed. If it is a major inconvenience, then we suggest using NILE, which is available for download from [www.novalogic.com](http://www.novalogic.com).)*

### Screen Buttons:



**C – Character Map** – Press this button or the **F1** key to show a full color representation of the terrain.

**H – Height Map** – This button or the **F2** key will bring up a topographical view of the terrain. The lighter the color on the map, the higher that part of the terrain. Solid dark areas are usually low, flat spots, which are good for bases or airfields.

**D – Depth Map** – This view simply shows the contour map of the terrain. The closer the lines are to each other, the steeper the grade. Solid black represents perfectly flat areas. You can also use the **F3** key to see this map.

**P1 – Page 1** – The mission editor allows you to have two different missions open simultaneously. This feature is good for comparing missions or for copying/pasting elements out of one mission into another.

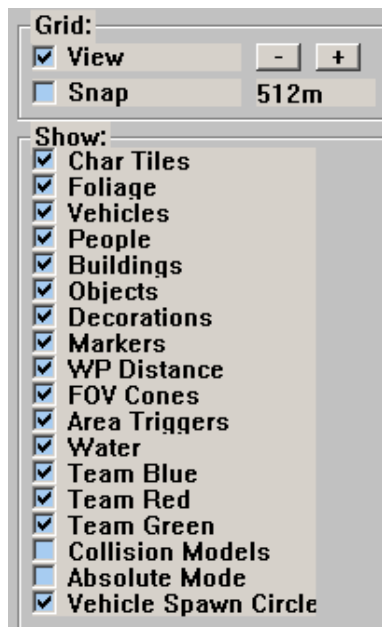
**P2 – Page 2** – Press this button to display the second mission that you opened. You must be on this page when you open the second mission or it will replace your page 1 mission.

**XY Coordinates** – This gives you the grid location measured from the center of your screen. Click on this to type in new coordinates and the screen will center on them. The units are in meters.

**Layers** – This option brings up a box that allows you to select which layers you would like to see and which ones are hidden. See **Section 4** for more information on Layers.

**Unselect All** – This button (or the **U** key) will automatically unselect all items.

**3D Wireframe** – This function is described in detail in its own section of the manual.



**Grid** – The **View** box will toggle the grid overlay on and off. Items that you insert into the grid while the **Snap** box is checked will move to the nearest grid intersection. This is particularly useful when you want to line items up precisely. Use the **Plus** and **Minus** symbols to increase and decrease the grid size.

**Show** – By checking the appropriate boxes you can choose which items you currently see and which are hidden from view. This is useful for finding specific things in a map filled with multiple kinds of items.

**Absolute Mode** – When this is checked you will be working in absolute mode and the objects you move around in MED will not respect the terrain height.

**Collision Models** – This mode shows collision models of objects. It is nice when working with lots of trees or objects you can't see.

**Vehicle Spawn Circle** – These turns on and off the radius circle of vehicles. When vehicles are set up in a "Spawn Pool"

they will not spawn at their spawn location if another vehicle is inside the radius of the vehicle attempting to spawn.

Info	Thumbnail	Block
Selected: 1		
Item #0		
Name: nbo1051 - Nbo105 be		
SSN: 1		
Type: 2		
Facing: 0, 0, 0		
Waypoint: 0, 0		
X: -317.38914		
Y: -270.30722		
Z: 0.0		
AZ: 0.00000		
Group: 0 -		
Layer: 1 -		
Dimensions:		
Len: 12.295		
Wth: 8.277		
Hgt: 3.873		
Map:		
Elev: 0.0		

**Selection Information Box** – When you select an item, its most important statistics appear in the lower left corner of the screen window. Once you learn how to insert items, this box will become more useful. Clicking on the **Thumbnail** tab will show you an image of the current item. The **Tiler** tab brings up a selection of terrain tiles.

## Section 2: Creating a New Mission

This section outlines the basic steps required to start making a mission. The following pages detail the more advanced instructions, but for now we will go through the initial steps to familiarize you with the process since some of the later steps are dependent on the previous ones being set up correctly.

**Step 1:** Start the **DFXMed.exe** program. If you already have the program running and have opened a mission, please press **Clear** located under the **File** menu to start a new map from scratch.

**Step 2:** Select **General Information** from the **Edit** menu at the top of the screen.

**Step 3:** Enter a mission name and your own name into the appropriate fields. The mission name will appear in the mission select screen once the mission is exported.

**Step 4:** Select a **Mission Terrain**, **Mission Tile Set** and **Map Type** from the list. If you are making a single player game, you do not have to make a selection. Now click “OK” to close the window and load the new terrain. It may take a while for the new terrain to load.

**Step 5:** Select **Edit** from the menu bar and then choose **Briefing**. When the window opens, enter a brief description of the map. When the mission is exported, this briefing will appear in the mission select screen and when you press the “O” key during play.

**Step 6:** You should now see a pulled back view of your map with a grid on it as well as a green and red box. These boxes simply frame the “center” of the map (X=0, y=0). While you can place objects anywhere, you should keep the focus of your map towards the center.

**Step 7:** In the **Grid** window, click the – button until the grid size is 32m. Now use the PAGE UP or Numpad + key to zoom into the map until you see only four grid squares.

**Step 8:** Press the **Insert** key to enter **Insert Mode**, decide on a location for the player to start and left click the mouse to bring up the **Insert Item** window.

**Step 9:** In the **Insert Item** window, select “Markers” in the left hand column, then “Start, Player” in the right hand column, then click **OK**. This sets the point where the player will start the game. If you don’t place this marker, you won’t be able to get into the mission!

**Step 10:** Press the **INSERT** key again to change back to **Select Mode** and use the left mouse button to select the icon that you just placed. The icon will turn yellow. Now click anywhere in the **Selection Information Box** on the lower left of the screen. This will bring up the **Item Attributes** window for that object.

**Step 11:** Change the **Team** to “Good (Blue)” and the **Group** to “1” then click **OK**. This sets the team (good/bad/neutral) that the item belongs to as well as the group. The player start marker in Single Player games must be set to “Good (Blue)” and Group 1 for the game to work properly.



**Step 12:** Go to the **File** menu and select **Save** to save your mission. When you go to play a mission, the name that appears in the General Information screen's Mission Name slot will appear.

**Step 13:** Although you could export and play your mission at this point, it probably wouldn't be very interesting. You are now ready to begin placing enemies, setting mission events and determining mission goals. As you place them, refer to the appropriate section of this manual for more details.

**Don't forget to save your work often. Mission Designers will typically keep several back-ups of the files just in case they make mistakes on their current file.**

## Section 3: Editing General Information and Weapon Loadouts

Under **Edit** in the Tool Bar, select **General Information** to set the basic mission details. You will see the **General Information** window. This window contains selections for the terrain and game types along with other critical mission information.

The screenshot shows the 'General Information' window with the following details:

- Mission Name:** [Empty text box]
- Mission Designer:** [Empty text box]
- Mission Terrain:** [Empty dropdown menu]
- Mission Tiles:** [Empty dropdown menu]
- Mission Type:** Normal Mission
- Map Types:** Single Player
- Single Player Respawn:** [Unchecked checkbox]
- Starting Spin-map Zoom:** [Slider from 'Far out' to 'Close in']
- Win Conditions (Critical):** 6 rows, each with a checkbox, a dropdown menu (all set to 'null'), and a 'Score' column (all set to '0').
- Lose Conditions (Critical):** 6 rows, each with a checkbox, a dropdown menu (all set to 'null'), and a 'Score' column (all set to '0').
- Bonus Expiration:** 10
- Max Saved Games:** 3
- Global Effects:** Music 0, Reverb 0, Health 0, Mana 0
- Mission Overrides:**
  - Water Level (x0.5 m):** [Unchecked checkbox]
  - Water Color:** 0 0 0
  - Murk Percentage:** 0
  - Fog Distance (m):** [Unchecked checkbox]
  - Fog Color:** 0 0 0
  - Environment File:** c2m05a\_z
  - Start Time:** 1500
  - Minutes per Day:** 1440
  - Night Vision Goggles Available:** [Unchecked checkbox]
  - Start with NVG Turned On:** [Unchecked checkbox]
  - Climate:** Desert
  - Wind Speed (kph):** 0
  - Wind Direction:** 0
  - Weather:** Nice Day
  - Rotate Map 180 degrees:** [Unchecked checkbox]

**Mission Name** – The name entered here will appear in the mission select screen once it is exported.

**Mission Designer** – Put your name here.

**Mission Terrain** – This pull down menu contains all of the terrains you can use to build a mission.

**Mission Tiles:** Mission tiles are specific sets of roads and other environmental art assets that are usually designed for a specific environment or mission. You can see the tile set by clicking on the “Tiler” tab in the **Selected Information Screen**. Changing this selection after laying down objects can result in your roads being turned into bomb craters! When the mission is exported, these objects and their positioning are exported as a separate .til file.

**Mission Type** – Select whether you want to make a Normal Mission, or an Extreme Mission. If you choose Extreme it will appear under a different column in the host menus.

**Map Type** – Select what type of mission you are making.

**Climate** – This will determine what color camo your player model is using (desert, jungle, or snow).

**Single Player Respawn** – This checkbox is to enable respawns in Single Player. You can use this in conjunction with player waypoints that trigger off of Advancement Events (see below) in order to create Check points as are in the DFX single player missions.

**Starting Spin Map Zoom:** You can choose the default spin map distance by sliding the bar.

**Win and Lose Conditions** – You can set up to eight win and eight lose mission goals in this area. The win and lose conditions are for goal information text only. The actual win and lose conditions are set up through the Event Triggers (described later in this manual). NOTE: If you have a “NULL” condition, no conditions following that one will display.

- **Critical:** When the game displays goals on-screen (G key), it will display them in the order they are listed on this screen. If you check one as Critical, it will be pushed to the top of the list. (This is untested and may or may not work.)
- **Score** - When a win or lose condition is met, the player will be awarded however many points you enter into this box. Win scores are added to the total and Lose points are subtracted (don't put a negative number) (This is untested and may or may not work.)

#### **Mission Overrides:**

**Water Level** - You can raise and lower the water level in your mission (measured in \_ meters) to drastically alter the terrain. We recommend that you do not go over 130 for most maps or the entire mission may take place underwater. This overrides the ENV file chosen

**Fog Distance** - If you want fog in the mission, select its level here. The fog-value represents the distance (in meters) you are able to see before the fog completely thickens and blocks all vision. For example, a fog value of 200 will allow the player to see 200m, but not any further. Valid ranges are from 0-2000. 0 means disable (no fog). A fog value of 1 will produce the most fog (player will see only fog). Most mission fog-values are from 200-500m. This overrides the ENV file chosen

**Fog Color** - You can alter the color of the fog by manually setting the Red, Green and Blue settings. Fog is best when Gray (50,50,50). This overrides the ENV file chosen

Other examples of fog colors:

Bright Red = 255,0,0

Yellow = 0,100,100

Medium Green = 0,120,0

Black = 0,0,0

Dark Blue = 0,0,25

White = 255,255,255

**Water Color** - You can alter the color of the water by manually setting the Red, Green and Blue settings. This overrides the ENV file chosen

**Water Murk** – This is a percentage value, 0-100 and overrides the ENV file chosen.  
NOTE: Be sure to click the box next to each selection to enable it.

**Wind Settings** –This is primarily to affect smoky particle effects by setting the wind speed and direction. Direction is from 0 to 359, 0 being north. Some wind speeds are: Light Wind = 25 kph, Heavy Wind = 50 kph, Hurricane Wind = 90 kph. (This is untested and may or may not work.)

**Environment File** – Choose one of these settings to alter the time of day in your mission. Be sure to check the **Night** box when selecting a night file, as this will properly adjust certain art elements.

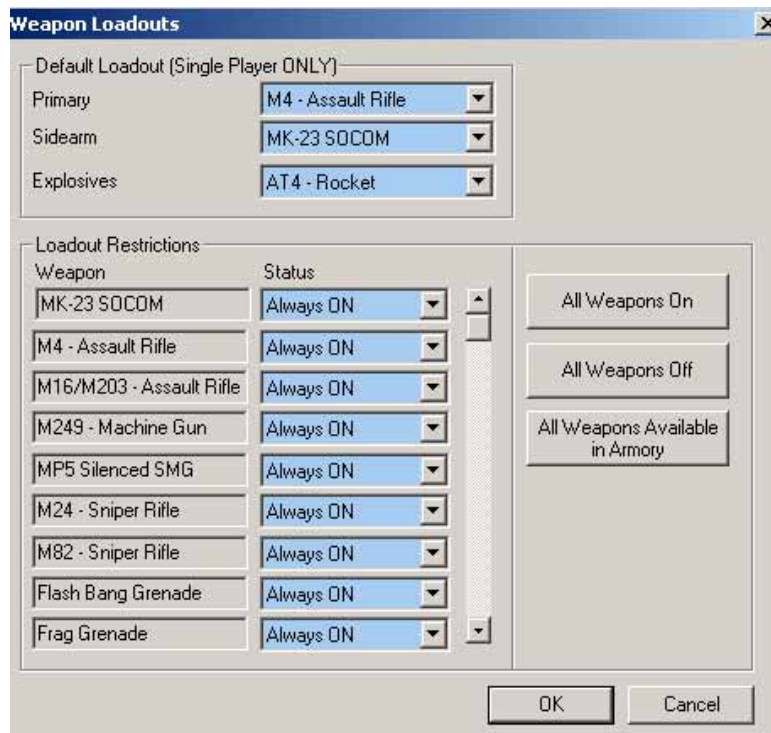
**Night Vision Goggles Available:** Check this if you want the player to be able to use NVG during the mission. Below that is another checkbox to indicate if you want the goggles to automatically be turned on when the mission starts.

## Weapon Loadouts:

By accessing the Weapon Loadouts screen from the **Edit** pull-down menu, you can choose which weapons the player will carry by default upon entering a Single Player mission. These options also work for Multiplayer maps.

Any weapon marked as “Always ON” will be selectable from the Loadout Screen in the game menus or from an armory.

You can disallow a weapon by selecting “Always Off” or pick “Armory Only” to allow that weapon to be selectable during a game only from an armory. Though in DFX there is no armory.



# Section 4: Groups and Layers

The most important part of building a good mission is organization. Planning your groups and layers is a major part of that organization. You can quickly get lost in a sea of meaningless numbers and objects unless you take the time to properly label everything. A little work in the beginning saves a lot of headaches later on.

## Groups

Groups are used to classify related items, such as a squad of enemy soldiers, and set an identity for Events and Waypoints (explained later). By assigning multiple units to a single group, you can give them group commands or have a single event tied to the fate of every unit in that group.

Group names are specified by clicking **Edit** then **Group**. This brings up the groups window. Highlight a slot and in the description area, type the name of the group such as “Player”, “Enemy buildings”, or “Enemy Reinforcements”. Keep your names simple and understandable. Once you have twenty or thirty groups, you may forget what a term was supposed to mean.

NOTE: The player always defaults to the first group. When you place the “Start, Player” marker, it **MUST** be designated to group “1” (or none) and have its team set to “Blue, good” to properly set off area triggers. This is also true for COOP maps. All members of Blue Team are always put into Group 1.

The more groups you have, the more detailed the triggering can be. It is often better to give each unit its own group, and therefore its own orders, so that it doesn’t interfere with other units. However, placing multiple units in a group will save you time when setting up the mission. You can automatically select all units within a group from the **Group** window by pressing the **Select Members** button.

You are able to save and print your Groups list as a text file. Click **Save As** to save the list to a text file. Print out this file for easy reference. You’ll be glad you did.

## Layers

A layer is simply a user assigned collection of groups and items that can be easily hidden from view. It is much like using the “show” field. By assigning similar elements to a layer, such as “foliage” or “vehicles”, you can quickly find exactly what you are looking for (or hide the things you aren’t seeking. You can create up to 32 individual layers for this purpose and assign an unlimited number of objects to a layer.

If you choose to **View By Layer**, the first 16 layers will be assigned a different color. Any objects assigned to this layer will appear as this color. Items attached to layers 17-32 will all appear as orange.

Under the **Edit** menu, you can change the **Layer Names** to whatever has meaning to you. Some examples of names are “Enemy Base”, “Friendly Waypoints”, and “Buildings”. When you just want to see a certain layer of items, hit the **Layers** button on the main screen and check the ones you want to see.

If you are having difficulty with getting tiles to appear on top of other tiles, try setting the tiles that you want to appear above, onto a higher layer.

## Section 5: Inserting Items and Tiles

Items represent everything that exists on the map from enemy vehicles and buildings to waypoints and event triggers to scenery such as trees and water towers.

To add an item press the **INSERT** key to enter **Insert Mode**, left click to set a new object down. This will bring up the **Insert Item** window where you can select the type and sub-type of item that you want to place. Note that the **Markers** selection includes Player/team start positions, waypoints, and King of the Hill (KOTH) multiplayer areas.

For now, place a soldier. Click the radio button next to **People** and then select “ESomal01” “Enemy Somali Soldier w/ AK47” and press OK. After placing the soldier, or any item, you can left click to insert another item. For now we will focus on our soldier.

Switch back to **Select Mode** by pressing the **INSERT** key and left click on the green semi-circle that represents the soldier and his field of view. The symbol will turn yellow and its basic statistics will come up in the **Info** box to the left. Click on this area to open up the **Item Attributes** window. While in the **Item Attributes** window you can only alter attributes that pertain to the unit(s) selected. You will not necessarily need to fill in every field available. Some fields will be grayed out, indicating that that option is not available for the current item. Note that any attribute you modify will be changed for all items currently selected (where possible).

You can add multiple objects to an area by holding down CONTROL and LEFT MOUSE and forming a box. The box will have an oval inside it. When the **Insert Item** opens, there will be a “Drop Count” option. Enter the number of duplicate items you want to place and click whether you want them to drop inside the oval or box that you formed. When you select an item and press **OK**, that number of items will be randomly placed inside the area your specified.

## Item Attributes Window:

**Item Attributes**

Type: Decoration  
Social Security Number: 1  
Graphic Name: nbo1051  
Layer: 1 - (unnamed)

Item: Nbo105 benches, non-driveable vehicle

LFP Group: 0  
Next SSN: 0

Position  
X: -317 38914  
Y: -270 30722  
Z: 0 0  
☐ Absolute Height ☐ Lock

Facing  
Heading (0 = North): 0  
Pitch (90 = up): 0  
Roll: 0

Remove If...  
☐ Less Than... 0 Players  
☐ More Than... 0 Players  
☐ Multiplayer

Spinmap Color Override  
Default Color

AI Variables  
AI Textfile: None  
Group: None  
Team: Neutral (Green)  
Alert State: Green  
Weapon Accuracy 1: 100  
Weapon Accuracy 2: 100  
Fire Timer: 10  
Spawns (WP pause): 0  
Max Attack Distance: 16  
Max Engagement Distance: 320  
Min Engagement Distance: 16  
☐ Mission Critical Item

Waypoints  
List: None Number: 0  
Name: Null Distance: 10  
Advancement Event: None  
☐ Navigation Waypoint

AI Attributes  
☐ Coward Name: 0  
☐ Advanced Ammo 0  
☐ Hovering  
☐ Berserk  
☐ Flying Organic  
☐ Blind  
☐ Guarding  
☒ Indestructable  
☒ Reflective  
☒ No Shadow

Cancel OK

## Item Attribute Definitions

**Social Security Number (SSN):** The tool automatically sets this number when an item is placed. It represents the item number of the unit. Every unit gets a SSN. The SSN can also be used to trigger an event that happens to, or because of, a specific unit. NOTE: Though the “Start, Player” marker will have its own SSN, the player’s character in the game has a special SSN of 10000, though in most cases the word “Player” has replaced the number. The player is also its own group called “Blue Player”.

**Graphic Name:** This is the actual file name for the chosen asset.

**Item:** This big button across the top allows you to change the currently selected item into any other item in the game. Simple click the item, Select the item from the list that you want to change it to and then click OK. Then click OK again and your item will have changed. You will note that you can change items between types as well as between items. This means a marker can become a decoration and so forth. Finally also be sure to CLICK Ok with your mouse and not simply hit ENTER as the item may not end up changing.

**Layer:** All units belong to a layer. Selecting an appropriate layer will help you to better organize the mission. See **Section 4** for more information on Layers.

**Position:** These are the precise coordinates of where you placed the unit on the map. East = -X, West = X, North = Y, South = -Y, Above Ground/Sea Level = Z, Below Ground/Sea Level = -Z. Be sure to properly set the Height (Z value) if you want to put objects on top of other objects (like soldiers in towers). You will likely need to adjust the second Z number to precisely place objects on tables and crates as well.

**Absolute Height:** With Absolute Height on, the Z value indicates height above sea level. With Absolute Height off, the Z value indicates height above or below the actual terrain at that spot.

**Lock:** This function will lock an item’s Z value regardless of the terrain you try to set it upon.

**Facing:** This is used to change the direction an item is facing. It can be set from 0 to 360 degrees, with 0 representing north, 90 representing east, 180 representing south and 270 representing west.

**Pitch:** This is the degree the object is pitched forward or backwards; something pitched at 90 will be pointed straight up rather than forward. (With Pitch and roll you will want to play with these as not all objects respect the same Pitch and Roll configurations.)

**Roll:** This is the degree the object is rolled forward or backwards; something rolled at 90 will be rolled to one side rather than being upright. (With Pitch and roll you will want to play with these as not all objects respect the same Pitch and Roll configurations.)

**Spin Map Color Override:** If you wish to alter the color a unit appears on the spin map, or make it invisible on the map, choose the color here. This is often used when you set enemy units temporarily to a different team, but don't want the player to notice.

**AI Textfile** - Chooses how the item will act. Each object should have an AI file designed and named for it. Make sure your Sub-type and AI text files match or they may not act properly.

**Group:** You can name groups whatever you want by clicking on **Edit** in the top left corner of the tool and then clicking on **Group**. Units in the same group will follow the same waypoints, follow the same orders, and be considered multiple part of one entity.

**Team:** This designates good guys, bad guys and the neutrals. Red will target/attack blue and vice-versa whether marked as goals or not.

**Alert State** - Selects the item's initial alert status. This status can be changed through the use of events and area triggers. Only Green and Red alert states actually function.

**Weapon Accuracy 1 and 2:** This number represents how well the unit shoots on their first couple of shots and then on subsequent shots. Lousy shots are 10 and under, good shots are around 30, great shots are anything over 50. However, anyone will hit fairly quickly at close range. Also, the longer someone continuously fires at a target, the more accurate they will get.

**Fire Timer:** This number determines how many seconds the unit will spend firing at a target before attempting another action such as changing targets or running.

**Spawns (WP Pause):** This has a dual purpose. When applied to a character, this is the number of times they will respawn at their original start point after being killed. When applied to a waypoint, this is how long units will pause at that spot before moving on.

**Max Attack Distance:** determines how close an enemy must approach before the selected item will begin the shoot at an enemy.

**Max Engagement Distance:** An AI will not approach any enemy unit that is further away than this number in meters.

**Min Engagement Distance:** An enemy items must be at least this close before the AI will attack it.

**Waypoints:** This is where you assign groups to waypoints. You can name and organize waypoint lists the same as groups (Left click on **Edit** and **Waypoints**). The number field is used to number waypoints. For King of the Hill areas adjust the Distance to increase the size of the hot zone. Choosing a name for the waypoint will display that name to the player when tracking that waypoint.

**Advancement Event:** When used with a Waypoint, the waypoints will not advance in the Spin Map, even if the player is within the waypoint, until the selected Event occurs.

**Navigation Waypoint:** If you want a waypoint on a player's waypoint path (to get a player to have a waypoint path open waypoints menu, choose waypoint list and check "Blue Team Waypoint") to be cyclable with the F7 key then check this box. This will allow the player to cycle his waypoints through this waypoints.

**AI Attributes:** Check the appropriate boxes to enable the following functions:

- **Coward:** When the player gets within a short distance, this unit will cower and surrender.
- **Hovering:** Used for helicopters to put them into the air at the beginning of the mission.



- **Berserk:** When the player or an AI unit is labeled as berserk, they become an enemy to everyone. Their friends will shoot at them and AI's will shoot their friends. This is most often used to turn blue NPC's against the player who does too much friendly fire.
- **Blind:** Won't see his friends getting shot even if they are next to each other and they won't see enemies. Blind AI's are good for keeping hostages from running away from firefights or keeping a Blackhawk from engaging enemies as it flies overhead.
- **Special State:** This engages special animations attached to certain characters. Most often it is used to attach Delta units to Humvees and MH-6 Little Bird side seats.
- **Indestructible:** Check this to make the unit unable to be killed. (Certain objects are hardcoded to be invulnerable).
- **No Shadow:** This means the item will not generate a shadow. This is helpful for objects that are mostly underground because the shadow will still render above ground.
- **Reflective:** Check this box if you want the object to be reflective in the water. Vehicles default to Reflective.
- **Name:** This number field is used for Map Named Location markers. They correspond to LOCATIONxxx fields in an RC file (which one can make with TextTool, available in the BHD mod downloads). So a Location000 with a string "Objective Charlie" would reference a Map Named Location marker placed in a mission and set with it's "Name" to "0". Only the top field here is used.
- **LFP Group:** This field is not used for DFX.

## Vehicles:

In order to get vehicles to work they must be piloted by an AI. Once an AI is driving or operating a vehicle, then the vehicle's own AI, specified in the AIP Text File under its Item Attributes, takes over.

To direct an AI to a vehicle, Put the AI on waypoint path 125, where the sub-waypoint the AI is to go to is the SSN of the vehicle you want him to attach to. Here is a breakdown of the special waypoints, so that you can direct your AI to climb into different positions inside a vehicle.

- **125** – When put on this waypoint an AI will first attempt to get in the driver position, and if that is taken it will try for a gunner position. If that is taken it will get on as a passenger.
- **124** – When put on this waypoint an AI will first attempt to get a gunner position. If that is taken it will get on as a passenger.
- **123** – When put on this waypoint an AI will only attempt to attach as a passenger.

If you redirect a number of AI to a vehicle, and then tell that vehicle to redirect to a waypoint list, the vehicle will look to see how many AI are coming to it. If they are nearby, the vehicle will wait for all the AI before taking off. If some of the AI are a long ways away, the vehicle will wait until all the nearby AI are in and then take off without waiting for those that are a long way away.

## Inserting Tunnels:

MED has a number of special structures that are used to create tunnels and corridors. In DFX, the pieces are labeled "DLabE1" or "DLabE2". Placing these pieces them can be tricky, and if they are not matched up exactly, the player may warp through a crack and end up on the surface, or stuck in a wall. It is best, when placing tunnels to enable Snap to Grid and have your grid set at 1meter increments. Then make your tunnel and if you need to rotate it, rotate the entire tunnel complex as one huge unit, after you are finished tweaking it on the 1 meter grid.

## Underground things to look out for:

**Can't get into tunnels** - If you suddenly pop to the surface, you may not have lined the pieces close enough. If you can't get through an entrance tunnel, you may have placed it on ground that is too uneven, or it is set too high or too low to the surface. This disrupts the piece's blink box that allows the player to pass through the ground and into the tunnels. Try adjusting the piece in \_ or \_ meter Z increments until it works properly.

**Hitting invisible objects while underground:** When you are in a tunnel the outside world disappears and you will not see it. But this does not mean it is not there. Be sure when placing tunnels that no rocks, or tree stumps penetrate down into the tunnel because their collision will remain, but you will not see them. This will cause the player to be unable to move in certain areas with no explicable reason as to why.

**Depth** – Tunnels cannot be placed below the absolute Z depth of 0.

**Underwater Tunnels** - Tunnels cannot be placed below the waterline. If you do, the player will shift to swimming mode.

**Z axis** – Be sure to check your Z axis often, especially after physically moving a tunnel.

**Absolute Mode:** When working with tunnels it is best to work in absolute mode so that your tunnels always remain at the same height, as opposed to following the height of the terrain.

## Inserting Squibs:

“Squibs” is an old movie term for a fake bullet impact. In the game, squibs are small explosives that you can trigger to go off on command. They are implemented by inserting two squib markers in 3D space to create a line.

The first marker, “Squib Start .50 Cal” for example, determines the type of bullet impact, the second, “Squib End” determines the direction of travel and end point for the squibs. To trigger the squibs, you must create a “Kill SSN” event and input the SSN of the “Start Squib” marker. You can link two or more squibs by inputting the second “Start Squib” SSN into the “Next SSN” box in the upper right hand corner of the “Squib End” **Item Attributes** Screen.

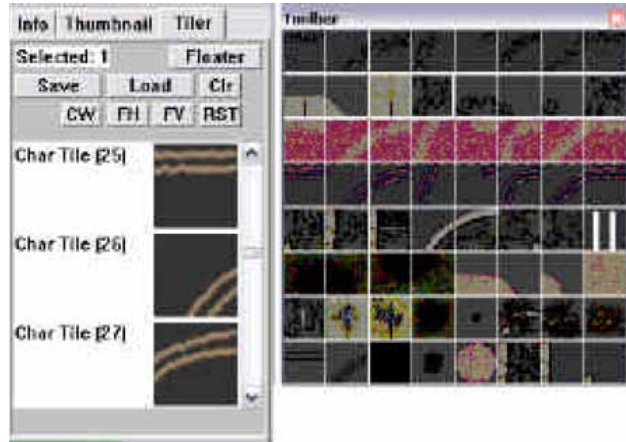
On the screen you will see a red line link the two markers. If you linked two squibs, you'll see a blue line linking the end of one squib line to the beginning of the next one. When triggered, the selected squib bullets will emanate from that red line. If the pitch remains 0, the bullets will shoot straight down. 90 degrees will shoot forward, 180 straight up and 270 straight back. If there is nothing for the bullet to hit within 100 meters, no detonation will occur.

## Inserting Tiles

Tiles are specific, 2D art assets that can be placed in the mission to help decorate a location. Tiles are usually roads, tire tracks, craters, etc and are placed into the mission a bit differently from other assets. You can only use one set of tiles in a mission. If you change this selection after laying down tiles you may turn your roads into bomb craters!

After selecting a tile set in the **General Information** window click on the “Tiler” tab in the lower left corner of your screen. Clicking on the **Floater** tab will bring up a small window with the tiles in it.

In either window, simply click on the icon you want. When you bring your mouse over the map, a yellow placement box will appear. Click to place it. It may help to set your map grid to 16m and turn on the snap setting. This will make lining up the tiles much easier since they are 16m x 16m in size. Some tiles show a dark gray or pink background. This background is actually transparent when placed on the map.



After unselecting a tile, you may see a black box around it. This is just an artifact and will disappear when you zoom in or out. When you are in the Tile Mode, you will not be able to select other objects and vice versa.

**Save / Load:** When a mission is exported the tiles are automatically saved in their own file with an extension labeled “.til”. This file contains the placement, orientation, and tile set for that mission. The MED has automated the saving and exporting of the tiles, but the buttons to do so manually are still usable. If you save your tiles, make sure you save it with the same name as your mission. Saving files can be helpful if you want to try a couple different layouts for your tiles.

**Clear:** Will remove ALL tiles from the mission. You will only be able to recover them if you had them previously saved in a .til file, so be careful with this button.

**Tile Rotate Keys:** The tiler window has a few buttons on it that rotate and flip the selected tiles to any orientation. From left to right, they are:



**CW** - Rotate tile counter-clockwise

**FH** - Flip horizontally

**FV** - Flip vertically

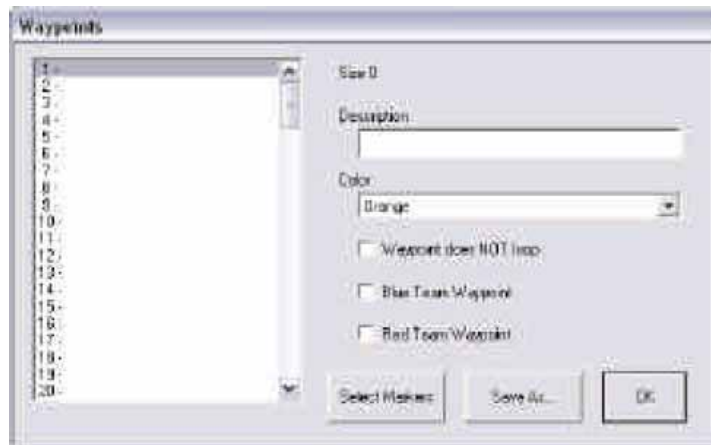
**RST** - Reset to original orientation

## Section 6: Waypoints

Waypoints are markers within the game that direct vehicles, characters and players to specific points within the map. Waypoints for the player are visible on the spin map, but waypoints for vehicles and computer-controlled units are invisible to the player. You can even assign a number of units to a single waypoint path.

Before you can assign a unit to a set of waypoints, you have to name them. Choose **Waypoints** under the **Edit** menu to bring up the waypoint window. You can name a waypoint group with whatever name you chose, but it should be self-explanatory, or it becomes very easy to lose track of which waypoints belong to which units.

The “Waypoint Size” shows how many individual waypoints are part of a waypoint group. If you check the “Waypoint does not loop” checkbox, then the unit will come to a stop at its last waypoint. Otherwise, units reaching their last waypoint will attempt to head directly back to their first waypoint and repeat the path. Be sure to check the appropriate red or blue team box. When you are done, click **OK**.



To print out a list of your waypoint group names, click **Save As** to save the list to a text file then print that file.

While waypoints are there to guide the players, they aren't required to follow them. So don't use “group 1 has reach waypoint...” as an event trigger (triggers are explained later in this manual, just keep it in mind when you get there). Instead create a large Area Trigger (detailed under events) which covers anywhere the player could be when you want the event to happen and use the “group 1 in area...” trigger.

### Special Waypoints:

**125** – Go To SSN – If you set a unit to this, they will go directly to the specified SSN (chosen from the Event Triggers). Specify a sub waypoint for this and the AI will go to that SSN. If that SSN is a vehicle, the AI will attempt to attach to the driver position of that vehicle. If that position is taken it will try for a gunner position. If that is taken it will get on as a passenger.

**126** – Go To Group – This is no longer functional.

**127** – Go To Player – Anyone set to go to this waypoint will track the player and follow. This should be used sparingly, because the AI will always know where the player is, even if they should not know. Furthermore it may cause navigation problems for the AI. Finally, it will only work in single player and not in COOP.

### Placing Waypoints

Waypoints are placed the same way as any other objects. In **Insert Mode**, select **Markers** from the list and choose **Waypoint**.

In the Item Attributes screen a waypoint is designated by a two number code such as 1-1 or 2-5. The number before the dash indicates its Waypoint List number. The number after the dash indicates its position in that list. Waypoints are numbered from 0 up, not 1 up. So, to the game engine and its AI units, the second waypoint in a list is “1” no matter what they numbered the object as.

### Setting up waypoints:

1. Go to **Edit** in the menu and then select **Waypoints**
2. Select the second slot. Click in the **Description** box and type “Enemy’s Waypoints”
3. Below that is a box that determines a color for the lines connecting the waypoints. Select color if you feel like it. Choosing different colors helps differentiate visually between groups when you have many waypoints in a small area.
4. Below the color box is a small check box. This determines whether or not your waypoints will loop. We don’t want our first waypoint list to loop. Click on it so that it is checked, then click **OK**.
5. Go to **Insert Mode** by pressing the **INSERT** key.
6. Click on the map somewhere near the soldier that you placed earlier to add the first waypoint.
7. In the **Insert Item** window, click on **Markers** then select **waypoint**. The waypoint will now appear on the map.
8. Click somewhere else on the map to place your next waypoint.
9. Notice that **Markers** and **waypoint** are already selected in the window that opens. Just click on **OK**.
10. Repeat steps 8 and 9 a couple more times.
11. Get out of **Insert Mode** by pressing the Insert key.
12. Select all of the waypoints you just placed and then click on the **Selection Information Box** to bring up the **Item Attributes** window.
13. Change the Waypoint List box to “2 – Enemy’s Waypoints”. Click **OK** to have the computer automatically number the waypoints.
14. You should now see a series of connected lines. This is your waypoint list.
15. The waypoints should all be attached to the same waypoint name, be numbered correctly, and connected by a line. If the line is incorrect make sure your waypoints are numbered in the proper order from 0 on up. Incorrect numbering can also occur if you add waypoints to an already existing list. If this occurs simply edit the number of each point manually.
16. To get the enemy unit to follow this new path, select the enemy unit and bring up the Item Attributes Window. Under the **Waypoints** section, Select List “2 - Enemy’s Waypoints” just as you did for the waypoints in Step 13. Click **OK**. Now that soldier will begin to follow this path at the start of the mission. Remember that units may not be able to traverse all types of terrain. Choose your path with that in mind.
17. Altering the distance of the waypoint alters its effective size. Setting the distance to zero means that any AI trying to reach that waypoint will hit the point exactly, even if it means lining up in a column to do it. A larger distance gives more leeway, especially for the player who may not follow your waypoint course exactly.
18. If you have multiple groups, you may assign them to the same waypoint path. If the path is not looping, they will eventually meet up at the end.

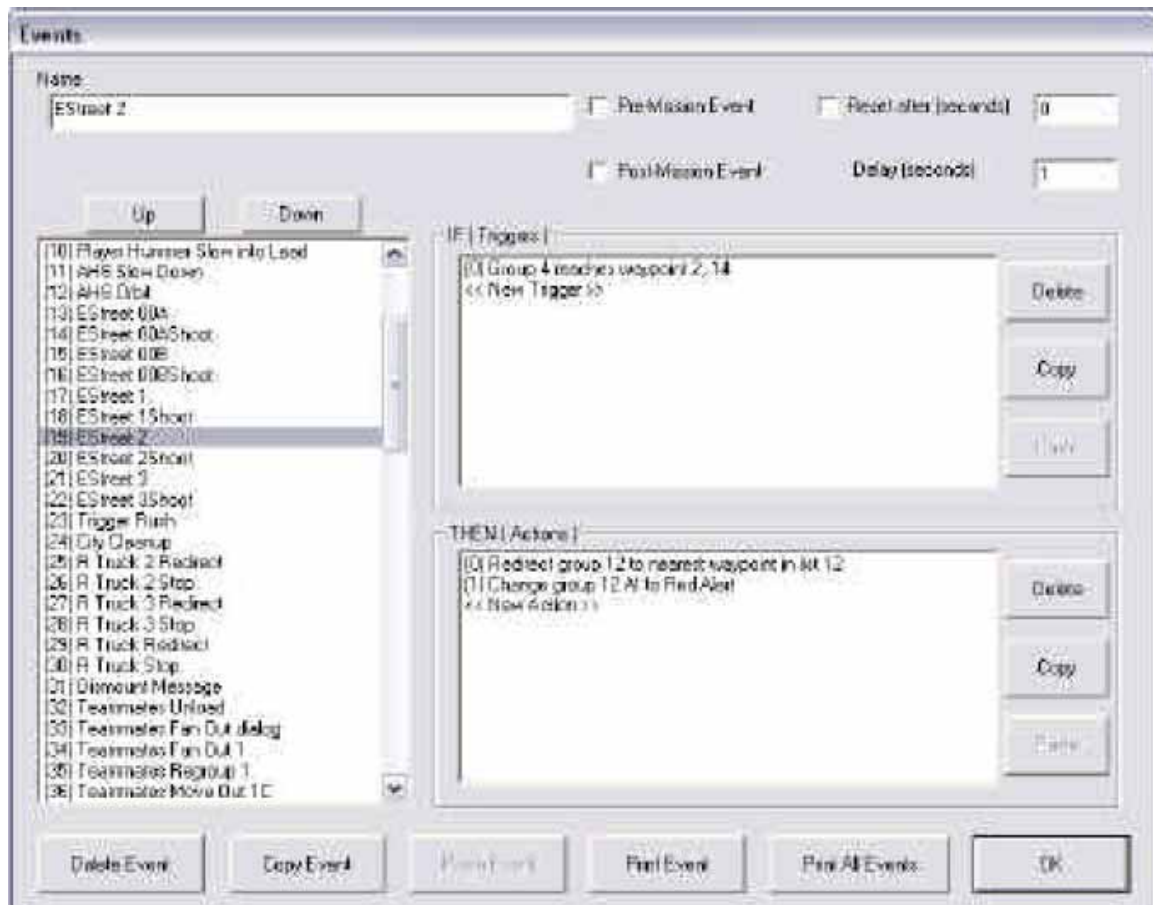
# Section 7: Events and Area Triggers

## Events

One of the most complex and powerful parts of mission editing is creating events. With this tool, you will be able to set up a series of actions that only occur when certain conditions are triggered. Each event is set up as an IF-THEN statement. In other words, IF one or more conditions are met by the game (are considered “true”), THEN the event (or multiple events) takes place. An explanation of the various trigger and event If-Then statements can be found in **Appendix B**.

You can have multiple If and Then statements for one event by using the “And”, “Or”, and “X-Or” buttons. Whichever you click will affect the next action you create for that event. By using “And”, you can require that multiple units be killed, that the player is within a certain area, and no neutrals have been killed in order to win the game. Using “Or” let’s you use just one of a set of actions to trigger an event. If one or all the actions in an “Or” event occur, the trigger will still execute. “X-Or” will trigger an event if only one of the actions listed is true. If both are true, nothing will happen.

It is important to remember that when you set up triggers for events the trigger logic goes from top to bottom. When you look at an event with multiple triggers, the order of And /Or triggers becomes very important.



## Sample Event

Here is an example of how to set up a win condition for a game. Say you wanted the player (who must be set to group one, remember) to win the game if they destroy a certain vehicle, you would do the following:

1. While in **Insert Mode**, place a vehicle on the map (make sure it is not indestructible).
  2. Return to **Select Mode** and select the vehicle.
  3. Right click the vehicle with the mouse and click on **Edit Item Attributes**. Select a unique **Group** under **AI Variables**.
  4. Open the **Events** window under **Edit**. You will see three large areas. The one on the left is where you choose events by name. The other two are the “If” and “Then” fields. Double click on << **New Trigger** >> in the “If” field to open the **Event Triggers** window.
  5. Select **Group** for the **Trigger Type**.
  6. Select **All Destroyed** for **Trigger Condition**.
  7. Under **Trigger Variables** select the group # of the building that you just placed then hit **OK**.
  8. Now double click on << **New Action** >> in the “Then” field to open the **Event Actions** window.
  9. Select **Blue Win** for the **Action Type**.
  10. Finally, for ease of identifying it, give the event a unique name at the top of the window such as “Win by destroying vehicle”.
- You have just created your first event! Now, when the player destroys the vehicle specified, the mission will end and a win message will appear!

## Other Event Commands

**Up/down:** You may reorder the positioning of your events by highlighting one and moving it up or down through the column. This has no effect on the triggering of events, it’s simply to help keep things organized.

**Reset after (seconds):** Once this event has been triggered, the mission can be set to automatically reset the trigger after a specified number of seconds has elapsed.

**Delay (seconds):** This is how many seconds must pass before the actions will execute. A zero delay means that the actions will be carried out as soon as the trigger conditions are met. Please note that the delay may not work the way you intend it to if you are using events to trigger other events.

**Pre-Mission Event:** Not used

**Post-Mission Event:** Not used

## Triggering Win and Lose Conditions / Sub-goals

In the **General Information** window you will find the Win and Lose sub-goal pull down windows. These windows represent specific sub-goals and are triggered as “then” statements. Sub-goals can be used to display information text on screen and to update the Goals list. You can also use a sub-goal being triggered as an “If” statement to trigger other events. (I.e. if sub-goal 1, “Destroy all Technicals”, is triggered then Blue wins).

During the mission you may want to display the various goals as the player triggers events. To do this you must first select your goals from the **General Information** screen. The order you select here will be the order they are displayed on screen. However, if you mark one as “Critical”, that objective will be at the top of the list.

Behind the scenes, there are the following types of text:

**Win Conditions:** This is the text that appears in the Med's Win/Lose pull down windows and in the Goals window in-game.

**Win Directives:** This text appears in the lower left corner of the screen and is a more descriptive version of your assigned task.

**Win Messages:** This is a past tense bit of text that appears on screen when you trigger a "Win Subgoal x" in the event's window. Not every subgoal will have one of these (no need to congratulate the player for successfully following orders to get on the Humvee.)

**Lose Conditions:** This text is what appears in the MED. It does not appear in the Goals window.

**Lose Directives:** This text appears in the lower left corner of the screen and can tell the player what NOT to do. I.e. "Don't shoot friendly units".

**Lose Messages:** This text automatically appears in the lower left if you trigger one of the "Lose Subgoal x" events.

When your mission starts you should have a Pre-mission event that has no trigger, but has Then actions that hide each of your Win and Lose Subgoals. (i.e. "Hide Win Subgoal x"). If you don't do this, all of the Subgoals will appear on screen at once.

To show a directive and make the condition appear in the Goals list, you will need to create an event that triggers a "Show Win Subgoal x". When that event is triggered the Goals list will update and the directive will appear on screen.

Once an objective is completed, trigger an event for "Win Subgoal x". The Past-tense, congratulatory text will automatically appear on screen.

Lose Subgoals work the same way, but they will not appear in the Goals list.

## Area Triggers

1. An Area Trigger is used to set off an event when the player, or any unit, enters a specified area.
2. To set an Area Trigger go to **Edit** and then **Area Triggers**.
3. Give a name to a trigger and click **OK**.
4. Enter Insert Mode and place two Area Trigger icons. They can be found under the **Markers** category.
5. Exit **Insert Mode** and select only the two points you just placed.
6. Now double-click on the info panel to open the **Item Attributes** screen. Under waypoints enter the number of the Area Trigger that you just renamed (you will not see the name) and click **OK**. A box will now appear using your two icons as corners.
7. You may now set events by choosing **Group Area Trigger** as your trigger condition then= selecting the appropriate area in the pull down menu of the "If" statement window. When the unit you select enters that area trigger, the specified event will take place.

## 3D Area Triggers

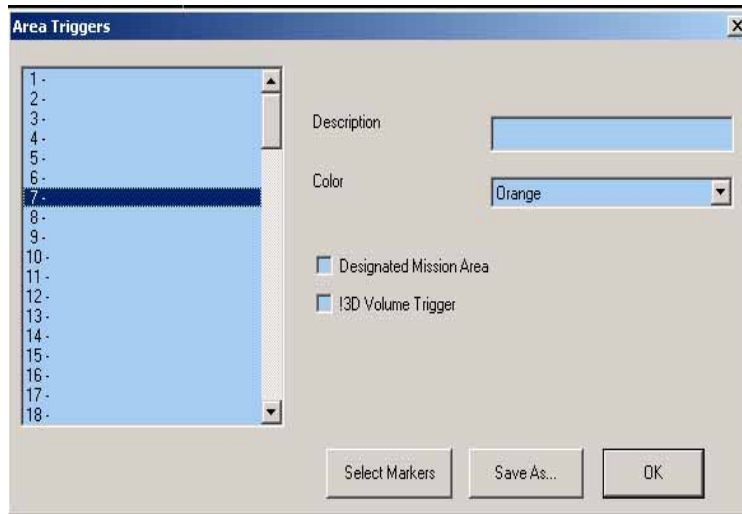
A typical area trigger will trigger no matter how far above or below it the player is. If you want to limit the 3D space of an area trigger (i.e. a trigger on the second floor of a building, but not the floor below it) you can do so by altering the height of your second Area Trigger marker.



When placing the points, make sure the marker with the higher SSN is the one with the higher altitude. Then to make area trigger actually function as a 3D area, you will have open up the area trigger menu and select “3D area.” See the picture below. When you are finished, you can see the area by selecting those two markers and opening up the 3D Wireframe view.

### **Designated Mission Areas**

There is a checkbox on the Area Trigger screen for you to select one or more area triggers as a Designated Mission Area. Once checked, you can set up a player driven event based on the player being outside the mission area.



# Section 8: Exporting and Playing Missions

You will not be able to play or test your mission until you convert it into a file that the game can recognize. When you are at a point where you would like to test your mission, save your current file normally. This saves the editable .mis file.

Next select **Export Binary Mission** under the **File** menu to export and save. Your custom mission will have the extension of “.bms” and must be located in the same directory as your game executable for it to be seen by the program. If you have selected tiles in your mission, the export will also create a .til file. The .til stores your tile information and must be kept in the same folder as the game as well.

NOTE:

This will export ONLY the map and its items.

To play your custom mission, start your game normally. In the **Single Player Missions** or **Multiplayer Hosting Screen** (depending on the type of mission you created) and select your mission from the list of games.

You can also use **Save and Export** which is extremely helpful. It will save the MIS file and also export the BMS.

Finally you can use **Save and Export with Stats** if you want to see the predicted memory load of your level. Be careful though, as using this export may crash MED. If you do this, a MISSION\_NAME.log file will be created that contains all of the stats, as well as appearing in the pop up dialog box.

## Number of Items Error

Each mission will only support a set number of items. When you export, the tool will indicate if you have too many different items.

The following Warnings can show up when exporting the file:

- The total number of Decorations and Buildings (X) exceeds the maximum (1200)
- The total number of Vehicles and Objects (X) exceeds the maximum (1200)
- The total number of Markers (X) exceeds the maximum (768)
- The total number of People (X) exceeds the maximum (768)

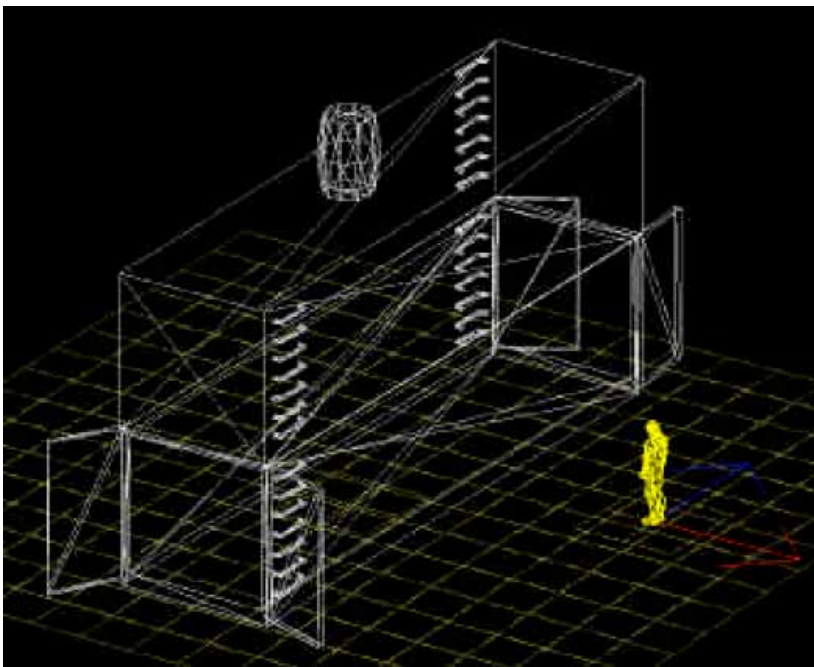
If you exceed any of these amounts, the file will still export, but any items exceeding the maximum number will not be exported. The number of objects should be reduced to the limit or unpredictable things could happen as a result of the excess items not being exported.

## Section 9: 3D Wireframe View

This mode will render the selected items in a 3D view so designers can accurately line-up objects in 3D space (fences, train-tracks, etc.). It is actually very difficult to precisely line up various objects without it. If you are placing objects inside tunnels, or on the upper levels of buildings, the wireframe will be indispensable for accurate placement.

The 3D mode has it's own set of key commands to accommodate the wireframe process. Since the wireframe view is slightly complicated, we will walk through the process of lining up two pieces. The key commands to alter your view and the placement of objects is confusing at first because they move in relation to the X, Y, Z axis, not your current view.

Here's a quick walkthrough:



1. First, place two cargo containers, a player start and a barrel near, but not touching, each other on a map. Use Cargo04, Cargo06 and Barl01 found in the decorations section of the **Insert Item** window. Highlight all four items and press the **3D Wireframe** button. The map section will turn black and you should see wireframes of your selected items (only selected items will appear)

The grids represent the terrain directly under the selected pieces. The grid will normally render in brown unless the view is from the underside, in which case the map will render in Green. An object will turn RED

if it collides with the surface and turn CYAN if it is entirely underground.

You'll notice that when you move a piece that the contour of the grid changes to reflect the new terrain underneath. Remember that the wireframe will only show the pieces that you selected in 2d mode.

You can shift your view of the wire frame by pressing **Control - Right Mouse** to rotate the view or **Control - Left Mouse** to move straight forwards and back as well as sideways. Remember, this shifts your view of the pieces; it doesn't actually move them (though it may look as though it does).

2. Press [ or ] until one of the cargo containers turns yellow. Press the **T** button to go to a top down view. You may already be in this view, but press it anyway. Now zoom out (**SHIFT + RIGHT MOUSE** or use the keypad **MINUS** key) until you can see both cargo containers. If the screen is too messy, press the **G** key to turn the grid off.

3. The next step is to bring the two pieces on top of each other. Zoom in or out (keypad – or + key) until both pieces are clearly visible. Use the four arrow keys to bring the selected piece over the other. You should get them to line up fairly close. Zoom in on one edge and use **CTRL + the Arrow Keys** to move the pieces in small increments until the pieces are squared up.

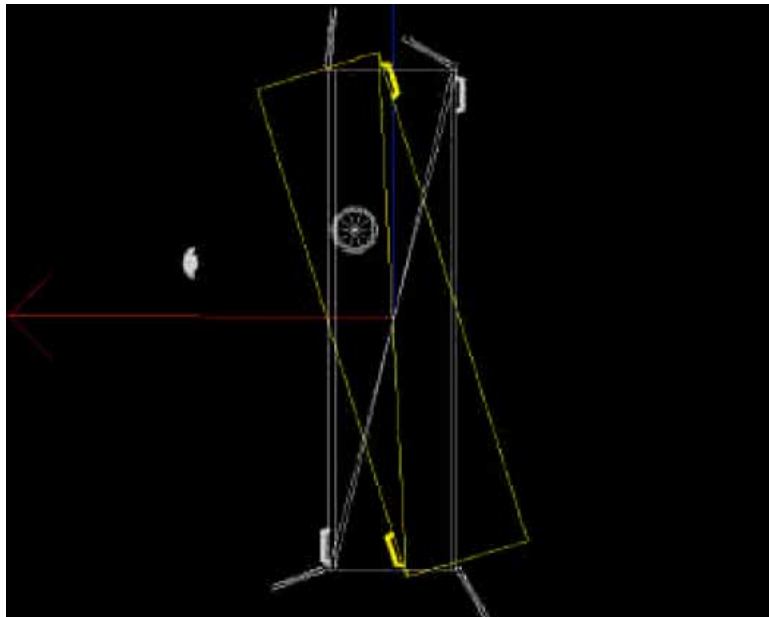
4. If you need to re-center the spot you are trying to line up, press **Control-Shift-Left Mouse** and then re-zoom.

5. Now that the pieces are lined up, you will need to adjust their height so one is on top of the other. Each piece has a Z and an AZ number in the **Info** window. These are vertical coordinates. AZ is absolute height over the map's 0 point. Z is the height over that spot of terrain. Use the [ or ] keys to switch selections and check their Z number. Press **Shift** and the **Up** and **Down** arrows to change the altitude in meter increments. Once the two numbers are close, press **Shift – Control** and the arrow keys to move the piece in smaller increments. Zoom in on a small section where the top and bottom of the two containers are to merge and adjust the height until they are perfectly lined up. The end result should be about 3 meters difference.

6. Since the cargo container ladders aren't meant to be stacked, you should rotate the top piece a few degrees to create a small ledge. Do this by pressing the **T** key to get a top-down view and then pressing **SHIFT + RIGHT** or **LEFT MOUSE** until it rotates about fifteen degrees.

7. Now move the barrel on top of the stacked containers. Press [ or ] until it's highlighted and use all the previous functions to place it on top of the both containers. Once everything is in place, save and export your mission. Load the mission and see how you did.

See **Appendix C** for a complete list of key commands.



# Section 10: Sound

One of the most important aspects of any game is sound. Environmental sounds help set the mood and locale and keep the game from feeling “empty” when there is no shooting or explosions going on. Some sounds in the game are inherent to the objects to which they are attached, such as vehicle sounds, and others are placed as invisible objects that have sound loops, such as running water or birds.

## Placing Markers

Sound markers can be found in the **Insert Items** window under the **Markers** heading. They will all be prefaced with the prefix of “SND:”. Some will have a suffix of “Loop”. Loop sounds will trigger when the player is close enough to hear them and will continue over and over. If the player is within range of a sound, it will be heard. Other sounds (those without the “Loop” suffix) play at pre-assigned, slightly randomized, intervals, but are also triggered by the player coming close enough to hear them.

## Fall Off Distance

Every sound in the game fades as you move away from it. This fading is part of a pre-configured “fall off distance”. The fall off distance is the range between the sound marker and the point where it can no longer be heard. Many (though by no means most or all of them) have a fall off distance of 200 meters. The sound will slowly get quieter until, at 200 meters, it is completely silent.

You will typically want to keep different sounds markers from overlapping, and keep similar ones close enough so there are no dead zones. Test out the distances and set them accordingly.

# Section 10: Design Guidelines

Now that you know the mechanics of making a mission, you must consider how to put the pieces together in a way that will be fun for the player and fit with the style and design of the existing missions.

## Difficulty

Any mission you create will be difficult for other people. No matter how easily you can complete your mission, believe anyone that tells you they have trouble. There are a number of ways you can adjust the difficulty with good mission design.

Good ways to reduce mission difficulty:

1. Lower enemy accuracy
2. Reduce the number of enemies that can see the player at one time
3. Set fewer enemies to prone and more to standing.
4. Set some enemies as cowards, or trigger them to run away from the player.

Bad ways to reduce mission difficulty:

1. Blind or deafen the enemy
2. Don't give the enemy any weapons

## Pacing

Missions need to have a certain flow to them. The opening view of the mission should be pleasant, and the first few moments of the mission should allow the player to get used to the terrain. The player should not be in immediate danger, and should have a good vantage point to figure out what they'll be doing. Once the player begins moving in, they should encounter patrols, sentries, or points of interest (like small villages). After this, they should come upon the main objective and be given opportunity to look it over before attacking it. Completing the primary objectives should be the height of action in the mission. If the mission requires extraction, there should be one more encounter on the way there.

Listed below are some general guidelines. Not all missions will run like this, but they are good guides.

### A. Opening

1. Pleasant opening view
2. No immediate threats
3. Chance to survey area

### B. Approach

1. Minor action or scenery to keep player interested
2. Chance to survey target

### C. Target

1. Action should ramp up and get more intense
  - a. A trickle of enemies is better than a flood; don't have the player get hit by everything at once.
2. Avoid having to "hunt down the last guy", make necessary enemies come to the player or exclude far-flung enemies from the win conditions.

### D. Withdrawal

1. Minor action or scenery to keep the player interested
2. Extraction area should be obvious (landmarks are good)

3. Don't try to kill the player at this point, the last fight can be thrilling, but shouldn't be deadly
- E. Finish
1. The player should feel accomplishment and not wonder "Why'd I win?"

## Details

Don't get wrapped up in triggering small details or events. Often times, you can spend too much time on one scene than should be spent. People won't sit and watch the AI move around for long. They're more likely to just shoot whomever they spot. So it's not as much a matter of **what** the AI is doing, as **where** the AI is.

## Waypoints

1. Use the "move timer" in waypoints to have enemies pause during their patrols. This is a simple way to give them a little more character.
2. Set up large patrol loops and you can put multiple enemies on them.
3. Remember to use area triggers instead of waypoint triggers to set off events when the player reaches a destination.

## AI attributes

1. Set higher minimum engagement distances on some enemies. This makes them more likely to fire than approach.
2. Vary the weapons the enemy uses, don't just give everyone the same gun, give some pistols, some rifles, some sub machineguns, etc. And change their accuracy to reflect the gun they use.

## Triggering

1. Trickle bad guys out of hiding by triggering one to run out if a buddy of his dies outside
2. Replace sentries, like guards in towers, by using events to have someone run up and replace them if they die.
3. Send out "search parties" of 1 to 3 enemies if the player fires from an area or kills a sentry looking over the area.
4. Redirect some enemies to run to cover when they go red alert.

## Other Hints and Tips

Plan out your mission before trying to create it in the Mission Editor. Having a good idea of what you want your mission to contain will make your work go much more efficiently.

1. For ease of viewing units, use the **Height Map** view (F2 key). The items will stand out more against this background, especially on snowy terrain.
2. Using the layering functions can help save a lot of time when fine tuning missions. Putting items in **Layers** may seem like a hassle for smaller missions but when more and more items are added, you will really wish that you had done it.
3. When you right click the mouse with no items selected, you can choose to **View by Side**; this will turn all of the bad guy's items red, all of the good guy's items blue and all of the neutral items green for ease of game balancing.
4. When placing buildings, use the F3 view to find a good flat spot.
5. In Capture the Flag missions, it's a good idea to drop a "**null**" marker on top of any flag you put down, then set the null marker to the team color of the flag. This allows

you to see your flags from a zoomed out perspective, where they'd normally be hard to see.

6. A good rule of thumb for placing objects is whenever you want to place an object which has others like it already in the mission, it's simpler to copy and paste it, then modify the new one (rather than switch to insert mode and create a new one).
7. When moving vehicles, remember to set up an event with both "change group velocity" and "redirect group to waypoint".
8. You can rotate several objects at the same time by selecting them, right clicking and selecting "Group Rotate" from the list.

## Start Markers

All types of maps need a player start marker. Multiplayer maps have different markers than the single player game and should have enough markers for simultaneous spawns of all players.

1. In Single player games, this will be the "Start, Player" marker. Non-team multiplayer games will use the "Start, dm" marker.
2. Team games will use "Start, (red/blue) team" markers.
3. To determine a specific order players are loaded in multiplayer games, you may set a number for each start position in it's attributes under Waypoints in the Number field.

**Save, export and test your mission often!**



# Appendix A: Trigger List

The following event “If” and “Then” statements describe a situation that must take place to trigger an event. When you select one of these trigger types in the events window, more options will open to allow you to specify what you want to have happen in order to trigger an event.

For example, if you select “Group” as an “If” trigger, then you select “All Destroyed” from the newly visible Trigger Condition, you can set an event to occur when every unit in that group has been destroyed.

Using this system can be daunting, but is very powerful once you start to link multiple events to each other.

It is extremely important to note that events triggered off of the “player” and or SSN 10000 will not work in COOP. To trigger events off of players in COOP you will have to use Group 1. For example: If ssn 10000 is in area 9 will work in single player and it will work in Serve and Play LAN, if the player serving walks into area 9. But in COOP if any other player, or the game is a dedicated server, the event will never fire. For that reason, when making COOP maps, always base events around Group 1 and not “player” or ssn 1000.

## “IF” Statements

### Trigger Types

The trigger type that you select will determine what objects, action or character will trigger an event.

**Null:** Nothing. Can be used as a temporary placeholder.

**2ndTime:** Not used and or not functional.

**Event:** Allows you to trigger events off of another event.

**Group:** Allows actions taken by, or against, a specific group to trigger an event.

**Mission Variable:** A mission variable is a number that can be added to or decremented by any other event. Using variables to trigger events let’s you create flexible missions where any number of events can lead to a single outcome. These Mission Variables are also accessible in the WAC script via v1 through v255.

**Player:** Allows events to be triggered based on certain player based actions. Note these events will not work for COOP.

**SSN:** Allows actions taken by, or against, a specific SSN to trigger an event.

**Teammates:** Not used and or not functional.

### Group Trigger Condition

These options can be selected if you set your Trigger Type to “Group”.

**Null:** Nothing. Can be used as a temporary placeholder.

**All Destroyed:** True if all members of the Group are killed/destroyed.

**All Intact:** True if every unit in this group is not destroyed.

**Any Alive:** True if any members of the Group are still alive. This will trigger immediately unless other conditions are set.

**Area Trigger:** True if Group is within the Area Trigger.

**Condition Red:** True if Group has spotted and is engaging the enemy. AKA Red Alert

**Condition Yellow:** Not used and or not functional.

**Has X Units:** True if Group has X or more members alive.

**Holds Item:** True if Group is holding the an item in the specified group. This trigger works mainly for pickup things like the notebook, laptop and cashcase.

**Lost X Units:** True if X number of units in Group have been killed.

**Reached Waypoint:** True if anyone from the specified group reaches waypoint. Only valid waypoints will be listed.

**Saw Group:** True if the AI has seen the specified group, but has not targeted them yet.

**Saw SSN:** True if the Group has seen the unit (specified by unique SSN), but has not targeted them yet. This may only work with the first 128 ssns, or may not work at all. It is recommended that you use group.

**Shot Group:** True if Group X shot at and hit Group Y.

**Shot SSN:** True if Group X shot at and hit Unit Y (specified by unique SSN). This may only work with the first 128 ssns, or may not work at all. It is recommended that you use group.

**Targeted Group:** Before an AI can shoot they must target a group. This is true when that occurs. (This may or may not work.)

**Targeted SSN:** Before an AI can shoot they must target an SSN. This is true when that occurs. This may only work with the first 128 ssns, or may not work at all. It is recommended that you use group.

**Reached Waypoint:** Triggers an event as soon as a group reaches a specified waypoint. Only valid waypoints will be listed.

## Player Trigger Condition

**Berserk:** If an event causes the player to go berserk, you can trigger other events off of that action.

**Dialog Finished:** Not used and or not functional.

**Dialog Playing:** Not used in consumer version.

**Player Outside Mission Area:** If the player leaves the “Designated Mission Area” specified in the **Area Triggers** window for the specified amount of time, you can trigger an event. If they player returns to the Mission Area, the timer resets. If the player is inside just one of multiple mission areas, the timer will not count.

**Placed Satchel:** Will trigger is the player places a satchel charge within the specified area trigger.

**1st, 2nd and 3rd person views:** Not used.

## “THEN” Statements

A “then” statement is an action that occurs when one of the previously mentioned triggers is found to be true.

### Action Types

**Null:** Always False. Can be used as a temporary placeholder.

**Attach SSN to Emplaced Weapon:** If an AI is within range of an emplaced weapon, you can tell them to attach to and use it.

**Change AI in Area, Blue:** Allows you to alter an AI Variable such as alert state, skill level or engagement range, for every blue team unit with a specified Area Trigger zone. (This may or may not work.)

**Change AI in Area, Red:** Allows you to alter an AI Variable such as alert state, skill level or engagement range, for every red team unit with a specified Area Trigger zone(This may or may not work.)

**Change AI, Group:** Allows you to alter an AI Variable such as alert state, skill level or engagement range, for an entire group of AI.

**Change AI, Single:** Allows you to alter an AI Variable such as alert state, skill level or engagement range, for a specific unit.

**Change Group, Group:** Allows you to change every unit in a specified group to a different group.

**Change Group, SSN:** Allows you to change a single unit to a different group.

**Change Mission Variable:** A mission variable is a number that can be added to or decremented by any other event. Using variables to trigger events let's you create flexible missions where any number of events can lead to a single outcome. Use these options to add or subtract numbers to a variable. These Mission Variables are also accessible in the WAC script via v1 through v255.

**Change Team, Group:** Allows you to change every unit in a specified group to a different team.

**Change Team, SSN:** Allows you to change a single unit to a different team.

**Create Particle Effect:** Allows you to trigger a particle effect assigned to a numbered teleport target.

**Kill Group:** Immediately kill all members of Group.

**Kill SSN:** Immediately kill a specific SSN.

**Lose Subgoal:** When triggered,

**Output Text:** Not used and or not functional. Replaced by "Show Win/Lose Subgoal"

**Play Dialog:** Used to trigger pre-scripted dialog trees. This is not available in the current consumer build due to lack of sound tools. Try using the WAC script to trigger and play dialog.

**Redirect Group:** Make Group go to Waypoint X-X or to the nearest waypoint.

**Redirect SSN:** Make specific SSN go to Waypoint X-X or to the nearest waypoint.

**Reset Event:** Once an event has triggered, you can reset it so that it will occur again.

**Reset Has Visited Flags, Group:** When a unit in a group reaches a waypoint, they are "flagged" as having been there. You can reset the flag so they can re-visit that waypoint. This is mainly relevant to waypoints that are non-looping waypoint lists.

**Reset Has Visited Flags, SSN:** When a unit reaches a waypoint, they are "flagged" as having been there. You can reset the flag so they can re-visit that waypoint. This is mainly relevant to waypoints that are non-looping waypoint lists.

**Show Lose Subgoal:** When you trigger a win or lose Subgoal, you must separately trigger the game to display the accompanying text. This allows you to track subgoals with showing the player during the game.

**Show Waypoints:** Setting this to 0 will hide all of the player's waypoints. 1 will enable them. This is believed to not work in COOP.

**Show Win Subgoal:** When you trigger a win or lose Subgoal, you must separately trigger the game to display the accompanying text. This allows you to track subgoals with showing the player during the game.

**Target Group(a) by Group(b), Exclusive:** Will make a Group(b) target a designated Group(a) and will ignore all other targets.

**Target Group(a) by Group(b), Priority:** Will cause a group(b) to target the designated group(a), if visible, but it will also target other viable enemies. Priority is weighted by distance and other hardcoded factors.

**Target Group by SSN, Exclusive:** Will make an SSN target a designated Group and will ignore all other targets.

**Target Group by SSN, Priority:** Will make an SSN target a designated Group, if visible, but it will also target other viable enemies. Priority is weighted by distance and other hardcoded factors.

**Target SSN by Group, Exclusive:** Will make an SSN target a designated Group and will ignore all other targets.

**Target SSN by Group, Priority:** Will cause a SSN to target the designated group, if visible, but it will also target other viable enemies. Priority is weighted by distance and other hardcoded factors.

**Target SSN(a) by SSN(b), Exclusive:** Will make an SSN(b) target a designated SSN(a) and will ignore all other targets.

**Target SSN(a) by SSN(b), Priority:** Will make an SSN(b) target a designated SSN(a), if visible, but will also target other viable enemies. Priority is weighted by distance and other hardcoded factors.

**Teammates:** This option opens up options to create an evac for a wounded character.

**Teleport Group:** Will send all units in a group to the specified teleport target.

**Teleport SSN:** Will send a single unit to the specified teleport target.

**Turn Lights On/Off:** Turns light group 0 on or off. These lights are usually hardcoded into certain buildings. 1 is on, 0 is off. As of now, it is not used and or not functional.

**Vaporize Group:** Removes the Group from the game.

**Vaporize SSN:** Removes a single SSN from the game.

**Velocity, Group:** Allows you to change the current speed of a whole group up or down.

**Velocity, SSN:** Allows you to change the current speed of a single unit up or down.

**Win Subgoal:** Triggers a subgoal to be marked as “won”.

**Win, Blue:** Triggers a “game win” for the Blue team and ends the mission.

**Win, Green (Neutral):** The neutral team wins...hardly ever used.

**Win, Red:** Triggers a “game win” for the Red team and ends the mission

## Action Subtype: AI

These actions can be chosen when you set the Action Type to any of the various “Change AI” options.

**Null:** Nothing. Can be used as a temporary placeholder.

**AI State:** All helo command.

**Formation:** Not Used

**Return To Base:** Not Used

**Pretty:** Not used

**Land:** Stop forward motion and settles to ground. Rotors spin down and stop.

**Follow Waypoint:** Default setting. Set to this if you want a vehicle to take off that has just landed from setting its AI State to “land”.

**Attack Distance:** Changes the distance in which an AI will attack an enemy.

**Berserk:** When the player or an AI unit is labeled as berserk, they become an enemy to everyone. Their friends will shoot at them and AI’s will shoot their friends. This is most often used to turn blue NPC’s against the player who does too much friendly fire.

**Blind:** Doesn’t see anything, even right in front of them.

**Climber:** An NPC that is tagged as a climber will move up ladders to follow a target. Not used and or not functional.

**Combat Speed:** When a unit enters combat, they enter a new state. You can select their new attack speed here.

**Coward:** Set an AI to cower and not shoot at friendlies.

**Driver’s Skill Level:** Changes an AI vehicles driving speed and turning radius. Not used and or not functional.

**Engagement Range:** Changes the distance at which an AI will begin to pursue. This is typically set further than Attack Distance.

**Find and Use SSN:** Sets an AI to find an attach to special objects with user points (Fast Ropes on Black Hawks)

**Green Alert:** Changes AI status to the lowest level of attentiveness. “Everything’s fine”.

**Special State:** This engages special animations attached to certain characters. Not used and or not functional.

**Gunner’s Skill Level:** Changes the shooting ability of an AI to Poor, Good, Average, Ace. Not used and or not functional.

**Indestructible:** Set to 1 to make the unit unable to be killed. 0 to disengage. (Certain objects are hardcoded to be invulnerable.

**Patrol Speed:** When an AI has not seen an enemy they will patrol at certain speeds. Change that speed here.

**Play Part Animation:** Allows you to trigger special animations for various objects. Currently it is not used and or not functional.

**Red Alert:** Set's an AI to the highest alert state. They will be ready to shoot as soon as an enemy is seen.

**Stop Using Waypoint Z:** The Z waypoint is used with flying vehicles to keep them at a specific height. To let the flying unit break from that according to their attack AI, select 1. (May or may not be in use.)

**Target SSN:** Currently this is not used and or not functional.

**Use Waypoint Z:** The Z waypoint is used with flying vehicles to keep them at a specific height. If you've let a flying vehicle break from that height, select 1 here to bring them back to the default height. Currently this is not used and or not functional.

**Yellow Alert:** Set's AI to a medium alert state. They will be wary, but not trigger happy. Currently this does not function.

# Appendix B: Additional Key Commands

These keys are in addition to the commands listed in Section 1.

MED Key  
Chart

Mode	Keyboard	Mouse	Effect
<b>TILER</b>			
	SHFT+LEFT		Rotate selected tiles 90deg Counter-clockwise
	SHFT+RIGHT		Rotate selected tiles 90deg Clockwise
	SHFT+CTRL+LEFT		Flip selected tiles Vertically
	SHFT+CTRL+RIGHT		Flip selected tiles Horizontally
<b>2D/3D</b>			
	CTRL+SHIFT+T		Snap to Terrain
	CTRL+SHIFT+W		Snap to Water
	CTRL+SHIFT+G		Snap to Grid
	S		Hide Selected
	SHIFT+S		Hide Unselected
	G		Select this Group
	W		Select this Waypoint List
	A		Show All
	T		Select this Type
	CTRL+X		Cut
	CTRL+C		Copy
	CTRL+V		Paste
	CTRL+SHIFT+V		Paste with random Heading
	CTRL+Z		Undo (move, rotate, delete)
	CTRL+Y		Redo (move, rotate, delete)
	D		3D Mode Toggle
	M		Move
	U		Unselect
	R		Reset View/Camera
	CTRL+R		Reset View/Camera (no scale)
	Z		Reset Zoom
	ENTER		Edit Item Attributes
		L-click "info" box	Edit Item Attributes
	LEFT		Move Items Left 1/256 meter
	RIGHT		Move Items Right 1/256 meter
	UP		Move Items Forward 1/256 meter
	DOWN		Move Items Backward 1/256 meter
	SHFT+UP		Move Items Up 1/256 meter
	SHFT+DOWN		Move Items Down 1/256 meter
	CTRL+LEFT		Move Items Left 1 meter
	CTRL+RIGHT		Move Items Right 1 meter
	CTRL+UP		Move Items Forward 1 meter
	CTRL+DOWN		Move Items Backwards 1 meter

	SHFT+CTRL+UP		Move Items Up 1 meter
	SHFT+CTRL+DOWN		Move Items Down 1 meter
	SHFT+CTRL+LEFT		Rotate Items Left 30deg
	SHFT+CTRL+RIGHT		Rotate Items Right 30deg
	SHFT+LEFT		Rotate Items Left 1deg
	SHFT+RIGHT		Rotate Items Right 1deg

<b>3D only</b>			
	ESC		Back to 2D Mode
	G		Ground View Toggle
	C		Ground Collision Toggle
	X		Axis View Toggle (X is RED, Y is BLUE)
	P		Perspective Toggle
	E		Effect Box View Toggle
	A		Select All Items
	], CTRL+N		Select Next Item
	[, CTRL+P		Select Previous Item
	S		Side Camera View (looking north)
	CTRL+S		Side Camera View (keep current orientation)
	T		Top Camera View (North at top of screen)
	CTRL+T		Top Camera View (keep current orientation)
	SHFT+CTRL+	L Click	Center on point (same as 2D 'CTRL+L Click')
	CTRL+	L Drag Horizontal	Move Camera Left/Right
	CTRL+	L Drag Vertical	Move Camera Up/Down
	CTRL+	R Drag Horizontal	Rotate Camera Left/Right
	CTRL+	R Drag Vertical	Rotate Camera Over/Under
	INSERT/DELETE		Rotate Camera Left/Right
	HOME/END		Rotate Camera Over/Under
	SHIFT +	R Drag Horizontal	Zoom Camera In/Out
	PAGEUP/DOWN		Zoom Camera In/Out
	Numpad + / -		Zoom Camera In/Out
<b>Numpad Keys, multiple views</b>			
<b>Num Lock on</b>	CTRL+NUMPAD LEFT		Rotate Camera 90deg Left
<b>Num Lock on</b>	CTRL+NUMPAD RIGHT		Rotate Camera 90deg Right
<b>Num Lock on</b>	NUMPAD LEFT/RIGHT		Move Camera Left/Right
<b>Num Lock on</b>	NUMPAD UP/DOWN		Move Camera Up/Down
<b>Num Lock on</b>	CTRL+ Numpad UP		Auto center selected object
<b>Num Lock off</b>	NUMPAD RIGHT		Move Object East
<b>Num Lock off</b>	NUMPAD LEFT		Move Object West
<b>Num Lock off</b>	NUMPAD UP		Move Object North
<b>Num Lock off</b>	NUMPAD DOWN		Move Object South
<b>Num Lock off</b>	CTRL+NUMPAD LEFT		Move Object west in small increments
<b>Num Lock off</b>	CTRL+NUMPAD RIGHT		Move Object east in small increments

<b>Num Lock off</b>	CTRL+NUMPAD RIGHT	Move Object north in small increments
<b>Num Lock off</b>	CTRL+ NUMPAD DOWN	Move Objects south in small increments