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ArmA II & ArmA II OA

MISSION EDITOR

The manual assumes that you have to open the <u>mission</u> editor.
TIP: To switch between the manual and the editor, press <u>left</u> *Alt+Tab* keys*.*
NOTE: The abbreviations used here:
- LMB (an left mouse button)
- MMB (an middle mouse button, scroll wheel)
- RMB (an right mouse button)
- AI (an artificial Intelligence)

Contents

INTRODUCTION
The editor can operate in both <u>normal</u> and <u>advanced</u> mode:
- **Normal mode** allows the editing in <u>two</u>-dimensional (2D) space.
- **Advanced mode** allows the editing in both <u>two</u>-dimensional (2D) and <u>three</u>-dimensional (3D) space.
To create a mission (scenario), you need add content (objects) into a terrain. When the editor is started the map is empty, <u>no</u> mission objects are placed on.
NOTE: A <u>new</u> (empty) mission starts by <u>default</u>.

1. THE NORMAL MODE (2D)
Accessing The Editor

In the *Singleplayer* mode of a game:
1. In *Main menu*, select *Singleplayer* mode
2. In *Singleplayer* menu, select *Editor*
3. In *Select map* menu, select a map
4. Click the *Continue* button.

In the *Multiplayer* mode of a game:
1. In *Main menu*, select *Multiplayer* mode
2. In *Network games on Internet* <u>combo</u> box, click *New* button
3. In *Create game* dialog box, click *OK* key
4. In *Create game* <u>combo</u> box:
   - In *Difficulty* section, leave a <u>default</u> value*;*
   - In *Map* section, select a map;
   - In *Mission* section, select the *<<New – Editor>>* item
   - Click *Play* button

NOTE: There, the *<<New – Wizard>>* item invokes the editor to work with the game <u>templates</u>.

The editor operates likely in both *Singleplayer* and *Multiplayer* modes.
The difference is the mission <u>preview</u>:
- When in the *Singleplayer* mode, you is viewing from the perspective of a ***<u>first</u> person***.
- When in the *Multiplayer* mode*,* you will go into *Multiplayer Setup* <u>combo</u> box where you have to click *OK* button.

1.1 Interface

The interface of the editor is divided into <u>two</u> sections:
- At a left side the <u>map</u> section is. It displays objects <u>placed</u>.
- At the right side the <u>control</u> section is:
  - the mission parameters
  - the editing modes
  - the file management

1.1.1 Mission Parameters

- **The <u>untitled</u> menu** allows to choice a mission component for editing.
  NOTE: All <u>objects</u> and <u>parameters</u> of the mission for the *Intro* and *Outro* <u>cut</u> scenes store <u>separately</u> from the mission. Therefore, you can do not use both the *Intro* and *Outro* components.
  NOTE: Each component requires a unit controlled by <u>player</u> to be placed. A player controls his unit in the *Mission* component, and AI controls the <u>player</u> unit in both the *Intro* and *Outro* components. The *Intro* and *Outro* do <u>not</u> end when the player unit <u>died</u>, but can be ended using an <u>end</u> trigger.
  The mission components:
  - ***Mission*** is set by <u>default</u>.
  - ***Intro*** acts <u>before</u> the <u>briefing</u> screen.
  - ***Outro - Win*** acts <u>after</u> the <u>debriefing</u> screen if one of six *Win* triggers activated.
  - ***Outro - Lose*** acts <u>after</u> the <u>debriefing</u> screen if *Lose* trigger activated.
- ***INTEL*** dialog box allows:
  - To name a mission
  - To brief describe a mission
  - To set starting date and time to the mission
  - To set current and forecast weather to the mission
  - To set friendly sides to *Independent*

1.1.2 Editing Modes

Each editing mode allows the creation and manipulation the one of the <u>object</u> types.

To set editing mode you can click a mode option or press the associated function key on the keyboard.

The modes are set out in the <u>basic</u> order they would be used while creating a mission:

- *Units* **(F1 key)** - the creation and manipulation these.
- *Groups* **(F2 key)** - the creation and manipulation of the unit groups and of the links between the units, also the manipulation of the links between the units and <u>some</u> other objects.
- *Triggers* **(F3 key)** - the creation and manipulation these.
- *Waypoints* **(F4 key)** - the creation and manipulation these for a <u>selected</u> unit (a unit group).
- *Synchronize* **(F5 key)** - the synchronization of *<u>waypoint-to-waypoint</u>* and *<u>waypoint-to-triggers</u>* types.
- *Markers* **(F6 key)** - the creation and manipulation these.
  NOTE: The markers are <u>visible</u> while *Markers* mode.
- *Modules* **(F7 key)** - the creation and manipulation these.

1.1.3 File Management

- *Load* – the loading of a mission from directory: *%user profile%\ArmA 2\missions*.
- *Merge* – the importing of the objects into the loaded mission from other mission.
  NOTE: *INTEL* settings are <u>not</u> imported.
- *Save* – the saving of mission: name a mission and in the *Save as* menu select a way of saving:
  - *User mission* - the exporting of mission to directory: *%user profile%\ArmA 2\missions*. These missions are <u>only</u> available via the <u>mission</u> editor.
    NOTE: If mission is saved under a <u>new</u> name, only the ***.sqm** file will be written in the <u>new</u> folder. But if mission is saved under an <u>existing</u> name it also reloads other files in the folder.
  - *Export to single missions* - copying and packing of the mission to ***.pbo** file, and move it to the *Program Files\ArmA 2\Missions*. This may be accessed from the *Main menu*.
  - *Export to multiplayer missions* - copying and packing of the mission to ***.pbo** file, and move it to the *Program Files\ArmA 2\MPmissions*. This may be accessed from the *Main menu*.
  - *Send by e-mail* - copying and packing of the mission to ***.pbo** file, and loading of <u>default</u> email program using the file as an attachment.
1. *Clear* – the removing all objects (units, groups, triggers, waypoints, markers and modules).
   NOTE*:* The *INTEL* settings are retained.
2. *IDs* – the switching <u>on</u>/<u>off</u> the numeric identifiers of the objects placed on the map with a <u>map</u> editor (RTE *Visitor*). They might be used to refer to these objects in script.
   NOTE: The identifiers are hidden by <u>default</u>. These are visible at <u>high</u> zoom level.
3. *Textures* - the filling the terrain with the "satellite map".
4. *Preview* – the mission preview with the game functions.
   NOTE: The button appears lower *Texture* button once the <u>player</u> unit is created.
   To end the preview:
   - Press *Esc* key
   - In *Paused* menu, click *Suspend* (*Abort*) button.
   NOTE: If *Shift* key is held down while clicking on the *Preview* button, the preview will include the <u>briefing</u> and <u>debriefing</u> screens.
   NOTE: In *Multiplayer* mode the *Preview* button appears once the mission has been <u>saved</u>.
5. *Continue* – the resuming of the preview<u>without</u> changes. The button appears lower the *Preview* button after it is used.
   NOTE: The changes made after you exited the preview will <u>not</u> be shown this a way. Instead, you must click the *Preview* button to restart <u>with</u> the changes.
   NOTE: In *Multiplayer* mode the *Continue* button is <u>absent</u>.
6. *Exit*- the exiting of the editor.
   NOTE: An unsaved work will be <u>lost</u>. Save it before.

Edit Controls:

- **Pan** - hold down RMB and move the mouse.
- **Zoom** - roll the mouse wheel or press <u>NumPad</u> keys **"+"/"-"**.
- **Create (an object)** - double-click LMB on a map in the suitable editing mode.
- **Edit** - double-click LMB on an object.
- **Select** - one-click LMB on an object.
  NOTE: <u>Selected</u> objects are opaque, and <u>non-selected</u> objects are slightly transparent.
- **Move an object** - hold down LMB on an object and move a mouse.
  NOTE: It is <u>not</u> possible:
  - To move <u>*Units*</u> in *Groups* mode
  - To move <u>*Waypoints*</u> in *Synchronize* mode
- **Drag a selection box** –hold down LMB on <u>empty</u> space and move mouse over objects.
- **Add objects (to selected one)** –hold down *Ctrl* key and drag the selection box over the objects or individually by one-clicking LMB on each object.
- **Select objects associated with a group** –hold down *Shift* key and one-click LMB on a group leader or waypoint (if any).
- **Rotate** – hold down *Shift* key and hold down LMB on a selected object, and then move the mouse.
- **Select a waypoint-underlying object** –hold down *Shift* key and one-click LMB on an object with a waypoint attached to.
- **Edit the waypoint-underlying object** - hold down *Shift* key and <u>double</u>-click LMB on an object with a waypoint attached to.
- **Delete** - hover the mouse cursor on an object and press *Delete* key.
- **Cut**– select the objects and press *Ctrl + X* keys.
- **Copy** – select the objects and press *Ctrl + C* keys.
- **Paste**– place the mouse cursor where you want and press *Ctrl + V* keys.
  NOTE: Names of pasted objects automatically get indices to avoid conflicts.
- **Paste the object on original position** –press *Ctrl + Shift + V* keys.
  NOTE: It is useful when copying objects from a mission to other one.

Creating Units

A mission needs at least a unit <u>controlled</u> by a player to be run. There can be <u>one</u> player unit per a <u>mission</u>. A <u>playable</u> unit can be <u>controlled</u> by both a player and AI. There can be <u>any</u> number of the <u>playable</u> units per mission.
To create the <u>player</u> unit:

1. Select *Units* mode (**F1** key)
2. Double-click LMB on the map
3. In the *Insert Unit* dialog, set the *Side*, *Faction, Class,* and *Unit*
4. In the *Control* menu, select *Player*
5. Click *OK* button

NOTE: Here you may customize the settings *Rank, Special* and *Initialization* (see *Settings for Units*).

Unit Parameters
Name field represents referring to a unit via a script (***<u>global</u> variable***).
Description field represents a <u>text</u> in a <u>networking</u> lobby (in *Multiplayer* mode).

Side option**:**
- *BLUFOR* - opposites to *OPFOR* by <u>default</u>
- *OPFOR* - opposites to *BLUFOR* by <u>default</u>
- *Independent* - can be opposite to *BLUFOR*, *OPFOR* or both.
  NOTE: The side is friendly to *BLUFOR* by <u>default</u>.
- *Civilian* – a <u>satellite</u> of the *Independent* and can be opposite to *BLUFOR*, *OPFOR* or both.
  NOTE: The side is friendly to *BLUFOR* and *OPFOR* by <u>default</u>.
- *Game Logic* – a side of <u>formal</u> units which can be used for scripting.
  NOTE: The <u>formal</u> units <u>cannot</u> act like <u>normal</u> units.
- *Empty* – the side of insentient units.
  NOTE: This menu item appears after the player unit is created.

Control option**:**
- *Non Playable* - the unit is <u>controlled</u> by AI and is <u>not</u> selectable in the networking lobby.
  NOTE: *Non Playable* unit has <u>no</u> circle surrounding.
- *Player* - the unit is <u>controlled</u> by a player and is selectable in the networking lobby.
  NOTE: *Player* unit has a red circle surrounding.
- *Playable* - the unit is controlled by both a player and AI, and is selectable in the networking lobby.
  NOTE: *Playable* unit has a purple circle surrounding.

<div align="center">Preview Mission</div>

Once you have created a player unit you can preview the mission by clicking the *Preview* button.
The preview varies depending on the <u>game</u> mode:
- In the *Singleplayer* mode, preview allows see from the first-person perspective.
  To get back to the mission editor from the preview:
  1. Press the *Esc* key
  2. In the *Paused* menu, select the *Suspend* (*Abort*) button
- In the *Multiplayer* mode, the preview <u>first</u> displays the role assignment screen.
  NOTE: In the *Multiplayer* mode, to preview you have <u>before</u> to save the mission.
  To get back to the mission editor from the preview:
  1. Press the *Esc* key
  2. Select *Suspend* (*Abort*) button
  3. Navigate <u>back</u> to the *Create game* <u>combo</u> box
  4. Select the desired mission
  5. Click *Edit* button.

<div align="center">Saving and Loading Mission</div>

To save the mission:
1. Click *Save* button
2. Name the mission (if it is <u>not</u> already named)
3. Select a way for a saving
4. Click *OK* button

The save way determines where the mission will be available from:
- ***User mission*** (by <u>default,</u> for the mission editing only): The mission will be saved into
  %UserProfile%\My Documents\ArmA 2 \missions (for Windows XP).
- ***Export to single missions*** (for <u>*Singleplayer*</u> game mode): The mission will be saved into
  %UserProfile%\My Documents\ArmA 2 \missions, but will also be <u>copied</u> to
  %ArmA 2 installation%\Missions. The exported mission is saved as compressed ***.pbo** file. The
  mission can be accessed from the *Main menu > Scenarios > Single Missions* <u>combo</u> box.
- ***Export to multiplayer missions*** (for <u>*Multiplayer*</u> game mode): The mission will be saved into
  %UserProfile%\My Documents\ArmA 2 \missions, but will also be <u>copied</u> to
  %ArmA 2 installation%\MPmissions. The exported mission is saved as compressed ***.pbo** file.

- **Send by e-mail**: The mission will be saved into *%UserProfile%\My Documents\ArmA 2 \missions*, but will also be <u>copied</u> to *%ArmA 2 installation%\Missions*. The exported mission will have been sent by default e-mail service as attachment to.

To load a mission:
1. Click *Load* button
2. Select a map
3. Select a mission
4. Click *OK* button

<h2 style="text-align:center">1.3 Interacting with objects</h2>

Copy and Paste
1. One-click LMB an object
2. Press *Ctrl + C* keys
3. Set the mouse cursor where you want
4. Press *Ctrl + V* keys

Move
1. One-click LMB an object
2. Hold down LMB on it and move a mouse

Rotate
1. One-click LMB an object
2. Hold down the <u>left</u> *Shift* key + hold down RMB
3. Move the mouse
NOTE: It is <u>only</u> possible in the *Units* mode

NOTE: To select several objects you can use two ways:
- One-click LMB an object, hold down the left *Ctrl* key and one-click LMB another object.
- Hold down LMB and draw a selection box over objects.

Edit
To edit you have to double-click LMB on an object.
NOTE: The data that you put into the dialog fields are saved in ***.sqm** file. To edit it you have to exit the editor.

<h2 style="text-align:center">1.4 Units Mode</h2>

The *Units* mode is used to create and manipulate units:
- To create a unit, double-click LMB on the map where you want. An *Insert unit* dialog will open.
- To edit a unit, double-click LMB on this. An *Edit unit* dialog will open.
  NOTE: It is <u>not</u> possible to edit a unit in the *Waypoints* mode.

Unit settings:
- **Side**
  - **BLUEFOR** – the side opposites to *OPFOR* by <u>default</u>
    NOTE: The units are represented by the <u>blue</u> icons
  - **OPFOR** – the side opposites to *BLUEFOR* by <u>default</u>
    NOTE: The units are represented by the <u>red</u> icons.
  - **Independent** – the side may opposite to *BLUEFOR, OPFOR* or both.
    NOTE: It is friendly to *BLUEFOR* by <u>default</u>. The *Independent's* relations with *BLUFOR* and *OPFOR* can be set via the *Intel* dialog. These units are represented by the <u>green</u> icons
  - **Civilian** – the satellite of the *Independent* and can opposite to *BLUEFOR, OPFOR* or both.
    NOTE: It is friendly by <u>default</u> to both *BLUEFOR* and *OPFOR*. The *Civilian* can inherit the friends and enemies of the *Independent*. The units are represented by the <u>yellow</u> icons.
  - **Ambient life** – the side of <u>natural</u> units.

- o **Game Logic** – the side of <u>formal</u> units that among other uses can be used for scripting. The <u>formal</u> units <u>cannot</u> act like <u>normal</u> units.
  NOTE: This menu item appears once the <u>player</u> unit is created.
- o **Empty** – the side of insentient objects. It includes <u>empty</u> vehicles and other objects.
  NOTE: This menu item appears once the <u>player</u> unit is created.

The side of a unit defines the available options.

NOTE: It is <u>not</u> possible to change the side of unit once it has been created, but with <u>script</u>.

- • **Class** - it defines the class of a unit.
- • **Control** - it defines a controller of a unit.
  NOTE: If a unit is a <u>vehicle</u>, <u>extra</u> options are available.
  NOTE: The option is <u>not</u> available for *Game Logic* and *Empty* sides.
  - o **Non Playable** - the unit is <u>only</u> controlled by AI.
    NOTE: The non-playable units are marked by icon <u>without</u> circular.
  - o **Player** - the unit is <u>only</u> controlled by player. There can <u>only</u> be <u>single</u> player unit per a mission. The player unit is marked by <u>red</u> circular.
    NOTE: The <u>player</u> control of vehicle is different from one of the <u>man</u>:
    Player as Pilot/Driver/Gunner/Commander – the specified position will be playable by the player.
  - o **Playable** - the unit is controlled by <u>player</u> (via *Team Switch* (T key)) and by AI. Playable units are marked by magenta circular.
    NOTE: The <u>playable</u> control of vehicle is different from one of the <u>man</u>:
    Playable as Pilot/Driver/Gunner/Commander – the specified position will be playable by the player.
    NOTE: To place an <u>empty</u> vehicle you need to select *Empty* side.
    NOTE: If the vehicle is an ***unmanned air vehicle*** (UAV), then you need to set the *Special* setting to *Flying*. The <u>unmanned</u> vehicles have a crew of <u>invisible</u> units controlled by AI in the <u>driver</u> and <u>gunner</u> positions. Therefore an <u>unmanned</u> vehicle can be controlled through <u>waypoints</u> like a <u>manned</u> vehicle.
- • **Info age** – it defines how long a unit has been <u>unknown</u> since some unit belonging to the <u>same</u> side as player has seen it. Units are unknown (by <u>default</u>) unless enemy sees them (*Unknown*). This way you can reveal enemy unit to a side (*Center*) of the player.
- • **Vehicle lock** – it is only <u>functional</u> for an <u>empty</u> vehicle. It defines whether a player group can <u>board</u> the vehicle.
  NOTE: The <u>player</u> group's leader controlled by AI does <u>not</u> understand that a player <u>cannot</u> enter a <u>locked</u> vehicle. Scripting commands will <u>not</u> respect this setting.
- • **Rank** - it defines the unit rank. The highest ranking unit in a group will normally be its leader. Rank has some effect on a behavior - highly ranked units will be less likely to flee and also will be more intimidating to enemy.
- • **Unit** - it defines the unit <u>type</u>.
  NOTE: The option depends on the **Class**.
- • **Special** – it defines the start position of the unit:
  - o **None** – the unit is placed at a <u>specified</u> position.
    NOTE: The unit will be created in the <u>nearest</u> empty location to <u>avoid</u> collision.
  - o **In Cargo** - if the group <u>possesses</u> a vehicle with <u>empty</u> cargo seats the unit will be placed in one of these.
    NOTE: If <u>no</u> cargo seats are available, it will be created at the <u>specified</u> position.
  - o **Flying** – the <u>flying</u> vehicles (planes and helicopters, UAV) will be created in the air.
  - o **In Formation** - the unit will be created in formation around a group leader, <u>irrespective</u> of the specified position.
- • **Name** – the field is used to access the unit via <u>script</u>. Like variable names, it must be <u>unique</u> and <u>not</u> contain any spaces or reserved characters.
- • **Skill** - it defines a skill level of a unit.
- • **Initialization** – it can contain a script that is executed at the <u>start</u> of the mission. A reference to a unit itself is passed to the code as the <u>variable</u> ***this***.
  TIP: You can quickly move the cursor through the field by holding the left ***Ctrl*** key and press ***Left/Right Arrow*** key.

- *Description* - it is a text displayed next to the unit in the <u>networking</u> lobby.
- *Health/armor* – it defines man health/vehicle armor.
  NOTE: The value of 0 means a man is <u>dead</u>/a vehicle is destroyed.
- *Fuel* – it defines the fuel amount of a vehicle.
- *Ammunition* – it defines the ammunition amount of a man.
  NOTE*:* A unit with an ammo value of 0 has <u>no</u> ammunition.
- *Azimuth* – it defines the direction of a unit facing. It is possible to point around the circle by one-click LMB or enter the value directly into its own box.
  NOTE: If the unit is set *In Formation*, then it uses the direction of a group leader's facing.
- *Probability of presence* – it defines a chance the unit will be created in the mission.
- *Condition of presence* – it evaluates the value to either *true* or *false*.
  NOTE: If value of *false*, then the unit will <u>not</u> be created.
- *Placement Radius* – the field defines the radius of a circle in which the unit is <u>randomly</u> placed.

<div align="center">1.5 Groups Mode</div>

The *Groups* mode is used to create and manipulate the <u>unit</u> groups and links between the <u>units</u>.
To create a group:
1. Select the *Groups* mode (F2 key)
2. Double-click LMB on the map
3. In the *Insert Groups* dialog box, select the side, faction, type, name, and facing direction.

NOTE: Placing units near one-by-one in the *Units* mode <u>automatically</u> link them together.
To create a link between units:
1. Select the *Groups* mode (F2 key)
2. Hold down LMB on the unit to link <u>from</u>
3. Move mouse to another unit to link <u>to</u>
4. Release LMB

- The link is represented by a <u>blue</u> line.
- The linking of a unit can only be by one way, either link *to* <u>or</u> *from* the unit.

To remove a link between units:
1. Select the *Groups* mode (F2 key)
2. Hold down LMB on a unit to remove the link <u>from</u>
3. Move mouse to an empty space on the map
4. Release LMB

<div align="center">1.6 Triggers Mode</div>

A *trigger* is an object that waits <u>until</u> a *Condition* is *true* and then carries out an action.
NOTE:
- It is represented by a <u>blue</u> ellipse or rectangle with a <u>small</u> blue flag at the centre.
- The location and dimensions of a trigger are <u>not</u> always relevant.
- A trigger may be linked with a unit so that only this unit can activate it.
- A trigger can be used to return a list of objects that satisfy the <u>activation</u> condition.
- The <u>activation</u> condition is checked approximately <u>two times per second</u>.

To create a trigger:
1. Select the *Trigger* mode (F3 key)
2. Double-click LMB on the map

Trigger settings:
- *Axis "a"* (horizontal)*, Axis "b"* (vertical) - the dimensions of the trigger area in <u>meters</u>.
  NOTE: This is assumes that the trigger has <u>not</u> been rotated.
- *Angle* – the rotate angle in <u>degrees</u>.
  Example: "0" faces north, "90" faces east, "180" faces south, "270" faces west.
  To rotate a trigger:
  1. Hover a mouse cursor on the trigger flag
  2. Hold down *Shift* key + hold down LMB
  3. Move a mouse.
- *Ellipse/Rectangle* - the trigger shape.

- ***Activation*** – an activation <u>condition</u>.
  NOTE:
  - Some of these conditions <u>cannot</u> be efficiently created by <u>script</u>.
  - This option determines a value of the variable ***this*** in the *Condition* field below.
  - If the trigger is linked to a unit then <u>only</u> the relevant options will be available.

  <u>Activation conditions</u>:
  - ***None*** - the trigger will get the evaluation result in the *Condition* field to determine whether the *On Activation* code will be executed.
  - ***OPFOR/BLUFOR/Independent/Civilian*** – the *Side* that can activate the trigger.
    Example: If *Activation* is set to *OPFOR* the trigger will be activated when a unit of side *OPFOR* (*East*) enters the trigger area.
  - ***Game Logic*** - this will activate the trigger.
  - ***Anybody*** - this will activate the trigger.
  - ***Radio <radio_name>*** –this will activate the trigger via *Radio* item of the <u>action</u> menu.
    NOTE: The <u>radio</u> triggers can be reactivated <u>without</u> the deactivation of them.
  - ***Seized by OPFOR/BLUFOR/Independent*** – the trigger will be activated when the <u>seizing</u> side is deemed to be in control of the area. This condition works with the *Timeout* option. A <u>low</u> level of presence will activate the trigger after a time closer to the <u>maximum</u> timeout, and vice versa. Depending on unit <u>types</u>, the <u>seizing</u> side can be completely outnumbered (4:1) and <u>still</u> satisfy the <u>minimum</u> level of presence for the <u>maximum</u> timeout.

  <u>Alternative options</u>:
  NOTE: These options are available if the trigger is linked to a <u>unit</u>.
  - ***Vehicle*** - a trigger will be activated by the <u>linked</u> unit.
  - ***Whole Group*** - a trigger will be activated by the <u>group</u> (with leader linked to the trigger).
  - ***Group Leader*** - a trigger will be <u>only</u> activated by the <u>group</u> leader.
  - ***Any Group Member*** - the trigger will be activated by any one.
- ***Once/Repeatedly***:
  - ***Once*** – a trigger will remain active for the duration of the mission.
  - ***Repeatedly*** – a trigger can be reactivated after deactivation of it.
    NOTE: Most of repeatable triggers can only be reactivated once they have <u>deactivated</u>.
- ***Present / Not present***:
  NOTE: To be considered present, an object must be <u>alive</u> (<u>undestroyed</u>).
  - ***Present*** - a trigger will be activated when an <u>object</u> matching the *Activation* <u>condition</u> is within the trigger area.
  - ***Not present*** - a trigger will be activated when an object matching the *Activation* <u>condition</u> is <u>not</u> within the trigger area.
- ***Detected by <side_name>*** – a trigger will be activated when a unit of the one side is detected by a unit of a <u>specified</u> side.
- ***Countdown/Timeout (Min, Mid, Max)*** - these counters determine a delay (in <u>seconds</u>) to the activation.
  NOTE: If the *Min, Mid,* and *Max* values are different then a random value between them will be determined.
  - ***Countdown*** - <u>once</u> the trigger conditions are ***true*** the trigger will wait the specified time before activation.
  - ***Timeout*** - the trigger conditions <u>must</u> be met for the <u>duration</u> of the specified time before activation.
  NOTE: if a unit enters into the area of a ***side-present*** trigger <u>type</u> but leaves this before the timeout is complete, the trigger will <u>not</u> activate.
- ***Type*** – it defines the <u>effect</u> types on activation and the <u>abstract</u> types that are generally <u>unavailable</u> via <u>script</u>. These events will take place immediately after the *On Activation* script has executed.
  - ***None*** –by <u>default</u>, the trigger will execute script in the *On Activation* field.
  - ***Guarded by <side_name>*** - the trigger will define a <u>guarded</u> array.
    NOTE: A trigger <u>must</u> be linked to the unit for this type. The linked unit that has an active *Guard* waypoint will move to the first placed (<u>*highest* priority</u>) available <u>unguarded</u> point. If an

enemy is detected, the group guarding the <u>lowest</u> priority point will leave this to attack the enemy.

NOTE: The units controlled by AI will react over <u>any</u> distance, even if they are <u>not</u> capable of destroying the <u>detected</u> unit.

- o **Switch** - the option is useful for "breaking" a group out of the *Cycle* waypoint, or moving the group away from a *Hold* or *Guard* waypoint. When the trigger is <u>synchronized</u> with a waypoint, activating the trigger will change the unit's <u>current</u> waypoint to the <u>next</u> waypoint from the synchronized one.

  NOTE: *On Activation* script of the <u>synchronized</u> waypoint is <u>not</u> executed.
- o **End # (1–6)** – these will <u>end</u> the mission once the trigger conditions are <u>met</u>.

  NOTE: Each of the 6 <u>win</u> ends can be with a different <u>debriefing</u>.
- o **Lose** – this will <u>end</u> the mission in <u>failure</u>.

  NOTE: This <u>only</u> affects the debriefing.
- **Name** – it defines the trigger name for <u>script</u>. It <u>must</u> comply with variable name <u>rules</u> (<u>no</u> spaces, <u>no</u> reserved characters or words, and no duplicate).
- **Text** - it can <u>replace</u> the <u>default</u> name of the radio in the <u>action</u> menu and on the map.

  NOTE: In the mission editor, this is displayed when the mouse cursor is on the trigger.
- **Condition** - the trigger will activate when this returns **true** value.

  NOTE:
  - o The variable **this** refers to the *Activation* <u>condition</u> above.
  - o The variable **thisList** refers to units that are met the *Activation* <u>condition</u> within the area.

    NOTE: The **thisList** does <u>not</u> always refer to units that are activating the trigger:
    - ▪ If the *Activation* condition is <u>not</u> side related, **thisList** will return an <u>empty</u> list (array)
    - ▪ The **seized-by** trigger type will return units of <u>any</u> side.

  NOTE: If the *Condition* field is <u>blank</u>, the trigger will <u>never</u> activate. Using a <u>script</u>-based *Condition* allows the creation of <u>complex</u> *Activation*, including *AND/OR* conditions.
- **On Act (On Activation)** - the script will be executed when the trigger conditions are met.

  NOTE: Any actions defined by the *Type* will take place immediately after this begins.
- **On Dea (On Deactivation)** – the script will be executed when a *Condition* of a <u>repeatable</u> trigger returns **false** value after having been previously **true**.

  NOTE: The *Radio* trigger does <u>not</u> deactivate, and <u>never</u> executes the *On Deactivation* script.
- **Effects** – (see *The Trigger and Waypoint Effects* <u>below</u>)

To link units to triggers:
1. Select *Groups* mode (F2 key)
2. Hold down LMB on the unit to attach <u>from</u> and move the mouse cursor to the trigger to attach <u>to</u>.

1.7 Waypoints Mode

The **waypoint** is used:
- To <u>move</u> the units controlled by AI
- To <u>indicate</u> where a player has to move

NOTE: The waypoint is added to a unit <u>group</u>, <u>not</u> to the unit <u>itself</u>.

To <u>create</u> a waypoint:
1. Select the *Waypoints* mode (F4 key)
2. <u>One</u>-click LMB on a single unit or a group leader to add a waypoint <u>to</u>
3. <u>Double</u>-click LMB where you want to create the waypoint
4. In the *Insert waypoint* dialog box, adjust the settings
5. Click *OK* button

NOTE: Once first waypoint has been created the <u>next</u> waypoint will be linked to this.

To <u>delete</u> a waypoint:
1. Hover the mouse cursor over the waypoint
2. Press the *Delete* key

NOTE:
- If waypoints are added to a single unit or a group leader controlled by <u>AI</u>, the units will <u>follow</u> the allocated path.
- If waypoints are added to a single unit or a group leader controlled by a <u>player</u>, the player will <u>see</u> a waypoint indicator in a game.

The waypoint settings:

- **Select type** –the action that will be done when a unit controlled by AI <u>reaches</u> the waypoint.
  NOTE: <u>Some</u> waypoints allow link to the other objects to define behavior (see *Waypoint Types*).
- **Waypoint order** - the <u>order</u> number of the waypoint. You can use it to <u>insert</u> a waypoint between existing waypoints or <u>change</u> the order of existing waypoints.
  NOTE: The <u>order</u> numbering of waypoints on the <u>map</u> is different to the <u>index</u> numbering of waypoints in the <u>script</u>. The <u>start</u> position of a unit has <u>no order</u> number, but has the <u>index</u> number of 0. The <u>first</u> added waypoint has the <u>order</u> number of 0 and the <u>index</u> number of 1, and so on.
- **Description** – the text when a player has allocated a waypoint.
  NOTE: If this field is <u>blank</u>, the waypoint <u>type</u> is displayed.
- **Combat Mode** – it defines whether units controlled by AI will engage enemy:
  o **No change** - the group keeps its <u>current</u> mode.
  o **Never fire** *(BLUE)* - the leader will order his group to <u>hold</u> fire and disengage. The units will <u>not</u> fire on an enemy under <u>any</u> circumstances.
  o **Hold fire** *(GREEN)* - the leader will order his group to <u>hold</u> fire and disengage. <u>Individual</u> units can <u>open</u> fire on an enemy that is a threat.
  o **Hold fire, Engage at will** *(WHITE)*, the leader will order his group to hold fire, <u>but</u> engage enemy at will. <u>Individual</u> units can open fire on an enemy that is a threat.
  o **Open fire** *(YELLOW)*, by <u>default</u> - the leader will order his group to engage the enemy. Units will fire upon suitable targets, <u>staying</u> in formation.
  o **Open Fire, Engage at will** *(RED)* - the leader will order his group to engage upon suitable targets and move at will. Units can move <u>out</u> of formation.
  NOTE: Above rule for a group behavior holds for a <u>single</u> unit.
- **Formation** – it defines a formation that units controlled by AI will adopt:
  o **No change** - the group keeps the <u>current</u> formation.
  o **Column** - the group forms into column behind the group leader (unit 1).
  o **Staggered Col.** - the group forms into <u>two</u> columns. The right column is staggered behind the left, and the group leader (unit 1) is placed at the forward of the <u>left</u> column.
  o **Wedge** – the group forms into a wedge (by <u>default</u>), with unit 1 at the forward. Each following unit will tab an equal distance behind and to the left or right from the unit in front: <u>odd</u> units on the <u>left</u>, and <u>even</u> units on the <u>right</u>.
  o **Echelon L.** - the group forms into a line behind and to the <u>left</u> of the group leader (unit 1).
  o **Echelon R.** - the group forms into a line behind and to the <u>right</u> of the group leader (unit 1).
  o **Veer** - the group forms into an <u>inversed</u> wedge (see above).
  o **Line** - the group forms into a <u>perpendicular</u> line to the facing direction of the group leader.
  o **Delta** - the group forms <u>three</u> columns behind unit 1.
  o **Column (compact)** - the group forms into more <u>compact</u> column behind the group leader.
- **Speed** –the speed for units controlled by AI.
  NOTE: The speed is set when a unit <u>leaves</u> a waypoint, <u>not</u> when a unit <u>comes</u> into a waypoint.
  NOTE: In *Normal* or *Limited* speed mode, the leader will move at a slower rate to allow his group to maintain formation. A leader in an aircraft will probably <u>not</u> be able to move slowly enough to allow ground units to keep up:
  o **No change** – the units stay move at their <u>current</u> speed.
  o **Limited** – the units move at a low speed.
  o **Normal** (by default) – the units move at a <u>moderate</u> speed.
  o **Full** – the units move as quickly as <u>possible</u>.
- **Behavior**:
  o **No change** – the units stay in the <u>current</u> behavior.
  o **Careless** – the behavior is <u>non</u>-combat. The group forms the <u>compact column-like</u> formation, where each unit will directly follow the one in front, rather than the group leader. Infantry will carry their weapons in safe position (rifles across body, pistols holstered) and walk. Infantry will <u>not</u> fire on enemy (unless they are shot at), but vehicles will <u>still</u> fire on enemy. Units do <u>not</u> switch to a more alert mode if enemies are encountered. Units prefer move along roads whenever possible.
  o **Safe** – this is similar to the **Careless** mode, but units change behavior to *Aware* upon detecting an enemy.

- o **Aware** (by default) - The infantry moves at moderate speed, with units generally standing upright and making some occasional efforts to use cover when available. Most units prefer to travel along roads and travel in convoy irrespective of formation type.
  Tracked vehicles do not use headlights, and drive beyond of roads.
  Helicopters do not use searchlights. When enemies are known, infantry disembark from any transport (trucks, cars), and move carrying out bounding maneuvers, using available cover.
- o **Combat** – the infantry always move using bounding maneuvers, and normally keep crouched or prone unless moving. They make some use of available cover, choosing to spend some time crawling when in cover. They occasionally send out one unit ahead of the group as a scout. The vehicles do not use headlights at night.
  If enemy are known, infantry moves in a more cautious manner.
  NOTE: This type overrides other movement settings (*Combat Mode, Formation* and *Speed*).
- o **Stealth** – the infantry moves via cover whenever possible, spending much of time crawling. When they need to cross open ground, they occasionally choose to send scouts running ahead to reach the cover ahead as quickly as possible. A stealthy infantry formation can tend to end up quite fractured.
  Wheeled vehicles follow roads available, but no longer convoy.
  If enemy are known, infantry moves more closely together and spend more time prone.
- **Placement Radius** – the area where the waypoint is placed at random within the radius, in meters.
- **Completion Radius** – the area where a unit is desired as entered within the radius, in meters.
- **Position in house** – the list of the positions in a building.
  NOTE: The option only appears in the *Waypoints* mode and a mouse pointer is placed over building so that a house name appears.
- **Timeout (Min, Mid, Max)** – the time that the units controlled by AI will wait before moving to the next one.
  NOTE: If values vary then a random time (between *Max* and *Min* values) will be defined.
- **Condition** – the script that must to evaluate to **true** before the units controlled by AI will move to the next waypoint. In other words, the units controlled by AI will move to the waypoint and wait here until the script evaluates to **true**.
  NOTE: The variable **this** refers to the group leader and the variable **thisList** refers to all the group members.
- **On Act. (On Activation)** - the script executed when the waypoint is completed. Within the field the variable **this** refers to the leader and the variable **thisList** refers to all the group members.
- **Script** – it is only used if the waypoint is of the *Scripted* type (see *Waypoint Types*).
- **Never show/Show in cadet mode/Always show** - defines whether the waypoint is visible in a mission.
- **Effects** – (see *The Trigger and Waypoint Effects*)

Waypoint Types
The waypoint type defines what the AI units have to do when the waypoint becomes active.

MOVE - causes the units move to a location or object. This is completed when a unit or the group leader entered into the completion area. The radius of the completion area is from 1 to 500 meters depending on vehicle type and on the unit control (by AI or player). The movement depends on the behavior. If the next waypoint is far enough away, then a group boards its own vehicles (if any).
NOTE: If the waypoint is too far away or a valid path cannot be found, the units may never reach this.

DESTROY - causes the units destroy an object the waypoint is placed upon:
- If the waypoint is placed on an object of the same side that has to destroy, the waypoint will be considered complete.
- If the units are incapable of destroying the object, but consider it capable of being destroyed, they will wait until it is destroyed.
- If the units are incapable of destroying the object and consider it not possible to destroy, or of no interest (e.g., a tree, fence), the waypoint will be considered complete.
NOTE: If this type is placed spatially or on a non-target object, the units will attack a unit that happens to near the waypoint, irrespective of that unit's side.

GET IN - the effect of this depends on whether it is <u>synchronized</u>:

- If this is <u>not</u> synchronized, units will board their own vehicles with the <u>free</u> seats.
  NOTE: This happens as the waypoint becomes <u>active</u>, rather than when it is reached. The units will <u>not</u> move to the actual *Get In* waypoint, but carry out the board then continue move on to the *Get In* waypoint.
- If the waypoint is synchronized with a waypoint of a <u>friendly</u> vehicle:
  - o with the free seats, but the group has already enough free seats to fit the <u>whole</u> group, the units will move to the waypoint then the group will board the free seats of the <u>friendly</u> vehicle.
  - o with <u>some</u> free seats, but <u>not</u> enough to allow the <u>whole</u> group to board, the leader will order as many units as <u>possible</u> to board the <u>friendly</u> vehicle.
  - o with <u>no</u> free seats, the units will move to the waypoint, and then continue on to the <u>next</u> one.

SEEK AND DESTROY - It does <u>not</u> matter if the waypoint is placed <u>spatially</u> or on an <u>object</u>.

If the waypoint placed on an <u>object</u>, it will remain fixed at the displayed position of the object (even if the object actually starts the mission in the cargo of <u>another</u> vehicle or has its position changed by its *Initialization*).

Behavior is the <u>same</u> for <u>both</u> situations, the group will move to the waypoint, then the leader will move about to search the immediate area with his group trying to keep up.

The search area is limited to the leader's <u>expected</u> time of the search:

- A unit on <u>foot</u> will rarely search more than 50 m from the waypoint center.
- A unit in a vehicle will search up to 300 m from the waypoint center.

NOTE: The unit "visually" checks the search range so a search in a city will take longer time than in a field.
NOTE: The waypoint does <u>not</u> appear to make the units search in <u>buildings</u> although their path may lead them to enter <u>some</u>. Whether or <u>not</u> the units find the enemy appears to have no impact on the search duration or range.

JOIN – this has to be <u>synchronized</u> with a waypoint of <u>another</u> unit, the <u>attached</u> units will move to the <u>attaching</u> unit once they have achieved their "<u>synchronized-to</u>" waypoint, then join and follow that unit, <u>irrespective</u> of a side and rank.

The <u>attached</u> unit may have moved on, but the *JOIN* waypoint remains at the location when the waypoint became active.

NOTE: If the waypoint is <u>not</u> synchronized with, the units will treat it as a *MOVE* waypoint.

If the waypoint is <u>synchronized</u> with waypoint of <u>another</u> unit, when both groups are at their waypoints, the units of waypoint that is "***synchronized-from***" will join the units of waypoint that is "***synchronized-to***", <u>irrespective</u> of which group has the *JOIN* waypoint itself.

Only <u>two</u> groups can join via <u>single</u> JOIN waypoint.

To synchronize:

1. Click the *Synchronization* mode (F5 key)
2. Hold down LMB on the waypoint that is <u>attaching</u>
3. Move a mouse to the waypoint that is <u>attached</u>.
4. Release LMB

JOIN AND LEAD - the waypoint is like to the *JOIN* waypoint, <u>except</u> the <u>attaching</u> and <u>attached</u> units will be <u>opposite</u> in <u>each</u> time.

GET OUT - the units in their vehicles will move to the waypoint and disembark the members are in.

If the members, <u>except</u> the leader, are in another vehicle then this will stop to let them out.

NOTE: A <u>possible</u> complication occurs when the leader is riding in vehicle of <u>another</u> group. The *Get Out* waypoint will <u>not</u> be considered reached until the leader arrives at it under his own control (i.e., it will <u>not</u> complete until the leader is out of the vehicle).

If the *Get Out* waypoint is placed on an <u>object</u>, the units will move to the object location at the instant the *Get Out* waypoint becomes its current waypoint then <u>normal</u> disembark.

CYCLE - this switches the <u>active</u> waypoint to the <u>nearest</u> waypoint.

NOTE: The <u>automatically</u> created <u>first</u> waypoint (the initial position of a unit) is considered as a *Move* type and <u>can</u> be used by the *Cycle* waypoint, but you need have at least <u>one</u> more between these points. This type can be used to make the group move in a <u>loop</u> (to create a patrol). The *Switch* trigger can be used to "break" a group out of a cycle induced waypoint loop.

LOAD - the units will move to the waypoint then those on <u>foot</u> will board their own vehicles.

NOTE: They will get as the vehicle <u>cargo</u> and then as the vehicle <u>crew</u>.

UNLOAD - the units will move to the waypoint then those are in a vehicle <u>cargo</u> will disembark.
NOTE: Units in crew positions will <u>not</u> disembark.
TRANSPORT UNLOAD - the vehicle will move to the waypoint, where units of another group who are in vehicle cargo of the <u>original</u> group will disembark.
HOLD - the units will move to and stay at this waypoint.
NOTE: Only a *Switch* <u>trigger</u> or a <u>script</u> command will make the units to move <u>from</u> this waypoint.
SENTRY - the units will move to the waypoint and hold position <u>until</u> the group knows enough about units to identify which side these belong to, and that they are capable of attacking. At that point, the units will proceed to their <u>next</u> waypoint. They will <u>also</u> attack the spotted enemy on the way.
GUARD - this is used with the *Guarded by* <u>trigger</u> type. The units will move to the waypoint and wait for a point to require guarding. A point or object is only considered as guarded if a group has been set to guard it through a *Guard* waypoint (other friendly forces in the area are <u>not</u> considered). If there are <u>several</u> the *Guarded by* triggers, the group will move to the <u>first</u> placed (<u>highest</u> priority), <u>unguarded</u> trigger (or its linked object). Once at a guard point, the units will continue to check if a <u>higher</u> priority guard point requires guarding, or for an enemy to engage. A group can be made to stop guarding using the **setCurrentWaypoint** <u>script</u> command or a *Switch* trigger.
TALK - this is used with the *Effects* (see *The Trigger and Waypoint Effects* below). The leader will speak the given *Voice* phrase, complete with lip movements. The group does <u>not</u> need to move to the waypoint, instead skipping immediately to the <u>next</u>.
SCRIPTED – this executes the <u>script file</u> that is entered in the *Script* field in the *Insert/Edit waypoint* dialog. Enter the file name <u>directly</u>, <u>without</u> **exec** <u>script</u> command or quotation, and then enter up to 4 arguments in an array. This array is passed to the script in the form **[<unit>, <waypoint position (array)>, <object waypoint is attached to>, < element 0>, < element 1>, < element 2>, < element 3>]**.
NOTE: The units will wait <u>until</u> the <u>external</u> script exits before moving on.
NOTE: The *On Activation* field can be used to execute the script.
SUPPORT - the units will move to the waypoint and then wait <u>until</u> they may provide support for other units that require relevant support using *Call Support* menu. At this time, the <u>waiting</u> units will move to the location where support is required for, disembark from their own vehicles and wait for the <u>supported</u> unit to declare *Support Done* before being able to respond to <u>further</u> requests for support.
NOTE: Only a <u>medic</u> (ambulance); <u>ammo</u>, <u>repair</u> and <u>fuel</u> vehicles can respond to the support <u>requests</u>. The <u>first</u> available one of the support units will respond <u>first</u>, irrespective of distance.
NOTE: The <u>player</u> units <u>must</u> announce *Support Done* to allow the support units to be able to support.
AI leaders tend to request that every appropriate support unit attends them. AI will <u>not</u> take venerability of a support group into consideration when requesting support.
GET IN NEAREST - the units will only move to the waypoint if there are <u>empty</u> vehicles or vehicles on their side with the free seats that are within about <u>50 m</u> of the waypoint area.
NOTE: The units will <u>only</u> fill free seats in the <u>nearest</u> vehicle.
DISMISSED – the units will simulate casual off-duty behavior. They will move to the waypoint then be dismissed. The group will split itself into smaller ones of from one to two units, who will move to random locations within about a <u>300 m</u> radius, sit down, etc.
NOTE: The waypoint does <u>not</u> inherently alter <u>behavior</u> mode, nor make men disembark, land or turn vehicle engines off. The waypoint is considered complete if the group contacts with enemy.
AND – this is <u>only</u> available for units of the *Game Logic* side. The waypoint will complete when <u>all</u> waypoints it is synchronized with have been completed.
OR – this is <u>only</u> available for units of the *Game Logic* side. The waypoint will complete when <u>one</u> of the waypoints it is synchronized with has been completed.
NOTE: The units of the *Game Logic* side <u>only</u> have the types *AND* and *OR*.

The Trigger and Waypoint Effects

Effects are the same for a trigger and a waypoint. The **Effects** dialog box allows for audio and visual effects to be created when a trigger is entered (a waypoint is completed) or the *On Activation* script is executed.
NOTE: To open the *Edit effects* dialog box, press *Effects* button in the *Insert/Edit trigger (waypoint)* dialog:

- **Untitled condition field**
  NOTE: This must evaluate to **true** (in addition to the main *Condition*) for the effect to be activated.
- *Anonymous* – a sound comes from everywhere
- *Voice* – a sound comes from the trigger position
- *Environment* – a sound comes from everywhere
- *Trigger* – a sound comes from the trigger position
- *Track* – music soundtracks
- *Type*:
  - *NONE* - self-explanatories
  - *OBJECT* - a predefined 3D object in front of the field of vision
    NOTE: The effect is used to create the splash screen.
  - *RESOURCE* - a predefined graphical resource over the field of vision.
    NOTE: The effect is used to display splash screen.
  - *TEXT* - the text typed in the untitled field below, with the style chosen in the *Effect* option.
    NOTE: The effect is identical to the **cutText** scripting command.
- *Effect*:
  - *PLAIN* - displays the *Type* given (above).
  - *BOTTOM* - displays the *Type* given.
    NOTE: This plain text is placed at the bottom of the screen.
  - *BLACK* - turns the screen to black, and displays the *Type* given. GUI is hidden.
  - *BLACK FADED* - turns the screen to black without fading in, and displays the *Type* given.
    NOTE: If pause time is not given, the *curtain* and the displayed *Type* disappear after 5-10 sec.
  - *BLACK OUT* - turns the screen to black and displays the *Type* given. GUI is hidden.
  - *BLACK IN* - reveals the GUI after a black *curtain* is withdrawn along with the *Type* given.
  - *WHITE OUT* - turns the screen to white and displays the *Type* given. GUI is hidden.
    CAUTION: This can blind the player.
    NOTE: Make sure that a fade in time is set when calling the command.
  - *WHITE IN* - reveals the GUI after a white *curtain* is withdrawn along with the *Type* given.
  - *PLAIN WITHOUT FADING* - self-explanatory
- **Untitled text field** – the field can contain text which will display if the *TEXT* type has been selected from the *Type* option above.

1.8 Synchronization

Synchronization defines dependencies for the *waypoints* and *triggers* to control their execution.
Synchronization Types

Synchronizing	waypoint	trigger
waypoint	waypoint-to-waypoint	waypoint-to-trigger
trigger	trigger-to-waypoint	trigger-to-trigger

Synchronization is represented by a dark blue line.
To synchronize:
1. Select the *Synchronize* mode (F5 key).
2. Hold down LMB on the waypoint and move the mouse to other waypoint/trigger.
3. Release LMB.
To desynchronize:
1. Select the *Synchronize* mode (F5 key).
2. Hold down LMB on the waypoint/trigger and move the mouse into empty space on the map.
3. Release LMB.
NOTE: All the synchronizing links will be removed from the object.

Waypoint Activation

The synchronized waypoint will be activated when the other synchronized waypoints are active. This means that the *On Activation* code is not applicable while the synchronization.

If synchronization is of a **waypoint-to-waypoint** type, the AI units will move to the waypoint (even if the type would not involve moving to this).

NOTE: In game a player will see the synchronized waypoint as "*Wait*" type.

If synchronization is of a **waypoint-to-trigger** type, the units will wait at the waypoint until the trigger is activated.

NOTE: The trigger does not wait for waypoint to be activated, but the waypoint does.

The synchronization das not have a polarity. It does not matter which waypoint is **synchronized-from** and which is **synchronized-to**.

NOTE: With some waypoint types, such as *Get In* and *Join*, the synchronization has greater significance than timing. It defines which units shall join and which shall be joined.

The *Game Logic's OR* type is another case, it only requires one synchronized waypoint/trigger to be ready.

NOTE: It is possible to synchronize one waypoint with other waypoints of another group, or triggers.

<div align="center">1.9 Markers</div>

The *Markers* mode is used:

- to place the *marker icons* and *zones* on the map
- to define a possible starting positions for other objects via a grouping markers and other objects.

NOTE: Markers are only visible in *Markers* mode, but can be manipulated in other modes.

To create a marker:

1. Select *Markers* mode
2. Double-click LMB on a map

To remove a marker:

1. Hover a mouse cursor on a marker
2. Press the *Delete* key

To link many of markers with another object:

1. Select the *Groups* mode
2. Hold-down LMB on a marker to link from
3. Move a mouse cursor on the object to link to
4. Release LMB

The link is represented by a blue line between the linked objects.

The hold-down *Shift* key + one-clicking LMB is used to add the markers to.

To remove a link between the objects:

1. Select the *Groups* mode
2. Hold-down LMB a marker you want to remove the link from
3. Hover mouse on the empty space on the map
4. Release LMB

If a object is linked with many of markers it will randomly place at the beginning of the mission at a one of the markers or its own position. This offers another way to create randomness at a mission start, with more precise control compared to using the unit's *Placement radius* setting.

NOTE:

- A marker used in this way will still be drawn on the map.
- A marker cannot be attached to the object created in the terrain editor (*Visitor*).

The *Insert/Edit marker* dialog box:

Name – this can contain a unique name of the marker. The marker names should comply with the rules of the variable naming (no spaces, no reserved characters, and no reserved words).

NOTE: In other editing modes the markers can only be found by recognizing their names.

Dialog Options:

- **Icon** – represents an opaque symbol on the map at a fixed scale
- **Rectangle** - represents the form of a pattern filled zone defined by the shape. The zone is displayed covering the same physical area.

- **Ellipse** –represents the form of a pattern filled zone defined by the shape. The zone is displayed covering the same <u>physical</u> area.

Color - defines the marker color. Dark gray color is by <u>default</u>.

Icon / Fill option:

- The **Icon** option is only available for an *Icon* marker.
  NOTE: You can create *Icon* markers in-game by double-click LMB on the map within the *Diary*.
- The **Fill** option is only available for the *Rectangle* or *Ellipse* markers. The shape will be filled with the selected pattern. The fill patterns are slightly transparent.

Axis a / Axis b - these fields define the scale at which the marker will be drawn.

The <u>icon</u> markers have <u>relative</u> size, but rather display at a <u>constant</u> size irrespective of the map zoom. The axis values define the <u>relative</u> scale for the <u>icon</u>.

For example, marker with an axis value of 10 will be displayed 10 <u>times</u> larger than the <u>default</u> size of the icon display.

The <u>zone</u> markers have <u>absolute</u> size, in <u>meters</u>:

- *Axis "a"* presents <u>east-west</u> direction while hear <u>angle</u> has the value of "0"
- *Axis "b"* presents <u>north-south</u> direction while hear <u>angle</u> has the value of "0"

NOTE: To hide a marker set both axes to 0.

Angle - self-explanatory

NOTE: A marker can be rotated as a unit or a trigger.

Text - the <u>colored</u> text at the right from the marker (irrespective of the marker angle).

1.10 Modules

Modules are the *Game Logic* interfaces (<u>introduced</u> in *ArmA* 2).

They run the scripts <u>from</u> the game <u>default</u> setup.

To add module:

1. Select the *Modules* mode
2. Double-click LMB on the map

The *Modules* dialog box:

- **Unit** – self-explanatory
- **Name** – self-explanatory
- **Initialization** – self-explanatory
- **Description** – self-explanatory
- **Probability of presence** – self-explanatory
- **Condition of presence** – self-explanatory

A description of all the modules requires the text volume more than this manual. Therefore, this description here is <u>not</u> feasible and requires a separate manual. The some modules need to be described with the particular manuals.

1.11 Intel

To open the *Intel* dialog you need click LMB on the *INTEL* box.

The *Intel* dialog box:

- **Name** - the title of a <u>mission</u> or <u>campaign</u> will list for both the *Singleplayer* and *Multiplayer* game modes, and also in the Diary.
  NOTE: If you do <u>not</u> name a mission, the name of the mission folder will be used.
- **Description** - The description is displayed in *Multiplayer* game mode.
  NOTE: It is <u>recommended</u> to give a <u>short</u> description what the mission is about to identify it.
- **Date** - self-explanatory
- **Time** - self-explanatory

Weather – defines the <u>initial</u> weather.

NOTE:

- Setting the slider all to the <u>right</u> creates <u>clear</u> skies.
- Setting the slider all to the <u>left</u> creates a <u>thunderstorm</u>.

Fog - defines the underlined initial fog density.

NOTE:
- Setting the slider all the way to the right creates maximum density.
- Setting the slider all the way to the left is no fog.

Forecasted weather - is defined by the same way above with a linear transition from the initial weather conditions to the forecast conditions occurring over the first 30 minutes after a mission began.

Forecasted fog - is defined by the same way above with a linear transition from the initial fog conditions to the forecast conditions occurring over the first 30 minutes after a mission began.

NOTE: The first 30 minutes after a mission began, the game engine carries out some long term the dynamic simulation of the weather, although it is over a timescale beyond most mission duration (changes occurring over 1.5 to 14 hours). For controlling the weather after the first 30 minutes you can use script.

Independents are friendly to - defines a side to which the *Independents* will be friendly during the mission.

NOTE: The *Civilian* side can inherit the same allies and enemies from *Independents*.

2. THE ADVANCED MODE (2D&3D)

To access the advanced mode of the mission editor:
1. In the *Main menu* screen, press the left *Alt/Ctrl + E* keys
2. Select a map from the *Select map* dialog box
3. Click the *Continue* button

2.1 Interface

The interface consists of three sections:
- the panel of the object hierarchy is placed on the left
- the workspace with a map is placed in the center
- the editing bar is placed on the right:
  - the *Intel* dialog box
  - the bar of the editing modes
  - the menu of the project management

To switch the view modes, press the *Edit in 3D world/Edit in 2D map* button.

NOTE: Pressing *M* key you can switch the *3D/2D* view modes too. If you preview scene you can press *Esc* to access *Paused* menu, in which both the *Edit in 2D map* and the *Edit in 3D world* options are available.

NOTE: The *Synchronization* button absents in the editing bar.

Camera controls

Keyboard	Mouse	Description
W	-	Forward move
S	-	Backward move
A	-	Left move
D	-	Right move
Q	or rotate Scroll wheel forward	Upward move
Z	or rotate Scroll wheel backward	Downward move
NOTE: You can increase / decrease the action speed by pressing the *Shift/Ctrl* with keys above.		
Numpad 8	-	Upward rotate
Numpad 2	-	Downward rotate
Numpad 4	-	Left rotate
Numpad 6	-	Right rotate
-	Hold down RMB + move mouse	Free view

TIP: To place the camera on a map in the *Edit in 2D map* mode:
- One-click RMB on the map where you want
- In the context menu select *Default camera*

2.2 Centers and Groups

Before creating a unit you need to create a *Center* (*Side*) and *Group* for it.

To create the *Center*:
1. Select the *Center* (F10).
2. Double-click LMB on the map.
3. In the *Object properties* dialog box, select a *Side* from *Side* menu.
   NOTE: You can set *Friend state* each of four sides.
4. Click the *OK* button

To create the *Group*:
1. Select the *Group* mode (F2).
2. Double-click LMB on the map.
3. In the *Object properties* dialog box, click *OK* button.

NOTE: Units have their own groups. In single group might be one unit or more.

2.3 Unit

To create unit:
1. Select the *Unit* mode (F1).
2. Double-click LMB on the map.
3. In the *Object properties* dialog box, set up features of unit.
4. Click the *OK* button.

Creating of other objects is similar to those in the normal mode (2D).

2.4 Object Control

The control of selected object:

Keys	Mouse	Action
-	Hold down LMB + move mouse	Move
Alt +	Hold down LMB + move mouse forward/backward	Move upward/downward
Shift +	Hold down LMB + move mouse	Rotate
Ctrl + C	-	Copy
Ctrl + V	-	Paste

NOTE: Holding down *Shift* and clicking LMB on a unit or waypoint will not select all the objects associated with that unit's group as in the normal mode (2D).

2.5 HOW TO

How to use all the ArmA 2 houses stuff:
1. Download *Jon-C5- Editor* to have easily access to all houses and other objects used in the ArmA 2:
   http://www.armaholic.com/page.php?id=5932
2. Install the file as mod.
   NOTE: The add-ons are accessible in the both advanced (2D/3D) and normal (2D) mode.

How to export objects created in the advanced mode (2D/3D)

To use the objects for editing in the normal mode (2D) you can convert the ***.biedi** file to the ***.sqm** file. You may use "3de_conv" utility: http://armed-assault.de/news/biedi---sqm-converter.html

Installation (for the ArmA 2):
1. Unpack the archive.
2. Place the folder @ 3de_conv in %Installaion_path%\ArmA 2
3. Register this folder as a mod (in the game label add-**mod = @ 3de_conv**). This will place the objects created in the advanced mode (2D/3D).
NOTE: Objects placed without this add-on, after conversion **BIEDI** to **SQM** format will not be in their positions in the normal mode (2D).

Usage:
1. Copy **mission.biedi** from your mission folder created in advanced mode (2D/3D) into ***3de_conv*** folder.
2. Drag **mission.biedi** on the icon **3de_conv.exe**. It will be creating **mission.sqm**.

NOTE: If mission.sqm already exists then this will be overwritten.

Conversion parameters:
- Intro - Convert as the entry of the mission
- Win - Convert a conclusion (win) mission
- Loose - Convert a conclusion (loss) mission

NOTE:
- You can apply only one of the parameters at time
- You can enter the parameters:
    - In the command prompt
    - In created shortcut

Example: In the converter shortcut, *Target* field: **"C:\%your_path%\ 3de_conv.exe" intro**
In this case:
- Create a shortcut to **3de_conv.exe** within folder *3de_conv*.
- Set a parameter in the shortcut.
- Drag **mission.biedi** on the shortcut.

2.6 Import of content from mission.sgf

The editor in the advanced mode (2D/3D) saves the content otherwise then in the normal mode (2D).
In this case, the project folder contains two files:
- mission.biedi
- mission.sgf

You have to create similar project with some distinct "tag" in normal mode (2D) to import here the content from project created in the advanced mode (2D/3D).

Importing the contents:
1. Copy **mission.sgf** into the project folder created in normal mode (2D)
2. Open the **mission.sgf** with a text editor
3. On top of the script delete the following:

```
activateAddons [
];

activateAddons [];
initAmbientLife;
```

4. Write instead:

```
setAccTime 0.0;
```

5. On bottom of the script delete the following:

```
runInitScript;
finishMissionInit;
```

6. Write instead;

```
setAccTime 1;
```

7. Create init.sgf and write here:

```
If (isserver) then {execVM "mission.sgf";};
```

3. SCRIPTING

Creating a complex mission will require a scripting.
NOTE: The *Multiplayer* mission is much more complex. It is recommended that you created *Singleplayer* missions and scripts before creating *Multiplayer* missions.

Configuration and Function Viewing

It is possible to view configurations and functions in the mission editor. For this, you need to create three user missions:
1. Load a map you want
2. Create a basic project and save it as a user mission.

3. Create separately a <u>supporting</u> project to view <u>configuration</u> classes and <u>functions</u>, and save it as a <u>user</u> mission:
    *   Create a player unit
    *   Create *Functions* module. <u>No</u> synchronizing needed.
    *   Create a trigger:
        *   Set both Axis A and B to value of 0
        *   Enter the code into *Condition* field:
            !isnil "BIS_fnc_init"
        *   Enter the code into *On Activation* field:
            [] call BIS_fnc_configviewer (for configurations) / **[] call BIS_fnc_help** (for functions)

These projects allow you to switch between a viewing and working on the mission.

NOTE: The viewers will run when you open the <u>supporting</u> projects. To restart the viewers you have to restart those projects.

Debugging

You can use the option command **–showscripterrors** to see error messages:
1. Create the game shortcut on the *Desktop*.
2. One-click RMB on the shortcut.
3. In context menu, select the *Properties* item.
4. In the *Object* field, add the command:
    "C:\Program Files\Bohemia Interactive\ArmA 2\arma2.exe" **–showscripterrors**
5. Click the *Apply* button
6. Click the *OK* button.

Error Messages

Format

Error messages occur when the game engine loads the line of code but is unable to interpret the command. Error messages appear at the top of the screen when a mission starts. The message displays the basic information where the problem occurred. This is the location where the script stopped making sense to the game engine.

NOTE: The actual error may be on another line of code.

Example:
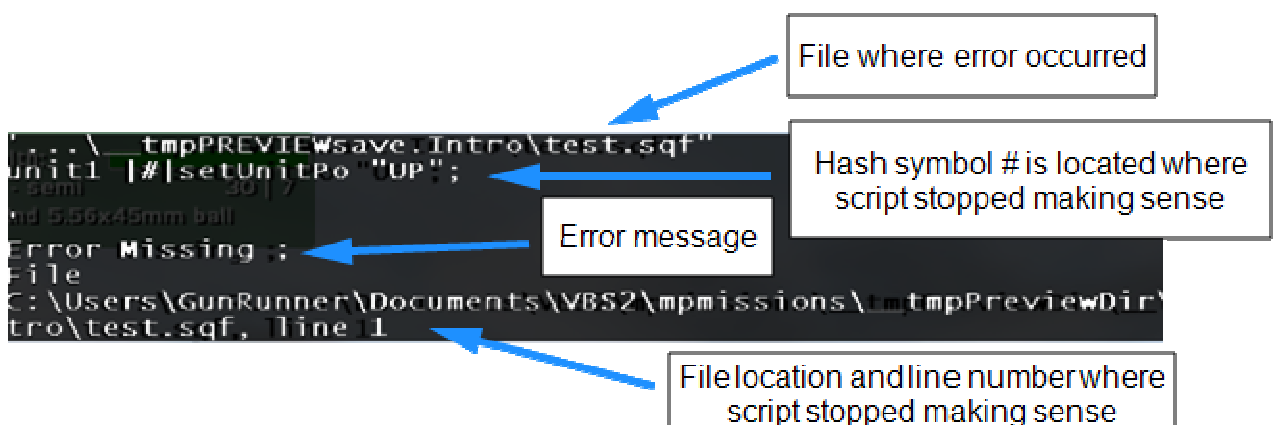
- **Scalar bool array string 0XE0FFFFFFEF**

The nonexistent variable displayed by the command *format*:

```
_local_variable = 12;
hint format ["%1", _loc_variable]; // Using a misspelled variable
```


- **Invalid number in expression**

The incomplete formula:

```
_newVar = 2 + ;
```


- **Generic error in expression**

The incorrect data type:

```
_vehicle setFuel "1"; // Using incorrect data type for numbers
_variable = "string" + 42; // Using incorrect data types when using mathematics functions
```


- **Type "*something*" expected "*another*"**

The unexpected data type:

```
"truck1" setFuel .5;
```


- **Type string expected code**

Usually occurs with a block of code:

```
If (alive player) then {player setUnitPos "UP";};
```

- **Zero divisor**

Trying to divide a number by zero or divide zero by a number. Can also occur with arrays

0/1 or 1/0
myValue = [1, 2, 3] select 4;

- **Error missing }**

The game engine shows where the script <u>stopped</u> making sense.

NOTE: The actual error may be found above or below the line number.

If (**alive player**) **then**
{
player setUnitPos "DOWN"
;

Trouble Shooting Tips

- Work on one section at a time.
- Save working copies as you go.
- Output the debug messages of key variables in different parts of the script.
  Use the command *str* to check the value of a single variable. If nothing is displayed on the screen, the variable does <u>not</u> have a value (a scalar error). Chances are the variable is misspelled somewhere.

player sideChat str _var1;
//advance scripting, see wiki for more information
hint format ["dir %1, dis %2", _var1, _var2];
player sideChat format ["dir %1, dis %2", _var1, _var2];

- Display messages when certain parts of the code are successful

player sideChat "reached section 1";