Instructor Manual

VBS4 24.1.1

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The BISim Wiki is the primary resource on VBS4 scripting:

https://sqf.bisimulations.com/display/SQF/VBS+Scripting+Reference

PhysX

VBS4 uses the PhysX physics engine. For more information on PhysX visit the Nvidia site.

https://gameworksdocs.nvidia.com/simulation.html

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1. VBS4 Instructor Overview

VBS4 gives Instructors the ability to manage complex scenarios and control them in real-time as they run.

Manage and control scenarios using the functionality of VBS4 in Execute mode, including:

- Execute scenarios online connected to VBS World Server or offline using a Dedicated Server.
- Control Trainee assignments in the Network Lobby.
- Monitor the scenario as it runs in 2D Map and 3D Camera views.
- Add additional visualizations such as Field of View and Hit Lines.
- Visualize AI behaviors including Path Planning, Cover, and Navigation Meshes.
- Record scenario executions for After Action Review including adding event bookmarks.
- Monitor VBS Radio communication, with options to communicate directly with trainees.
- Use VBS Gateway to monitor DIS / HLA compliant interoperable simulations.
- Provide scenario support functions such as Fire Support and Call for Fire.
- Directly manage individual entities using context actions and scripting commands.
- Use VBS Plan to annotate the scenario as it runs.
- Control AI behavior through Waypoints and Orders.
- Use VBS Editor functionality to create and manage Editor Objects.
- Manage the environment with Scenario Settings, Weather Settings, and Atmospheric Parameters.

The most important VBS4 use case is the operation and administration of multiplayer training during Scenario Execution (on the next page).

Instructors manage Trainee assignments in the Network Lobby (on page 21) and then manage the Scenario using the Instructor Interface (on page 25) (VBS Editor in Execute Mode).

The VBS4 Instructor Manual splits Scenario Execution functions into the following categories:

- Scenario Administration (on page 44)

  Perform overall Scenario Management functions, such as recording an After Action Review.

- Scenario Monitoring (on page 54)

  Monitor and visualize specific aspects of a Scenario Execution.

- Event Management (on page 128)

  Use specific VBS4 functionality to insert events or to provide functions such as fire support.

- Entity Management (on page 158)

  Use specific context actions to manage individual entities in the Scenario, such as Revive Unit.

NOTE

The VBS4 Instructor Manual focuses only on specific functionality that is only available in Execute Mode.

The majority of the Prepare Mode functionality of VBS Editor and VBS Plan is also available for use in Execute Mode. For more information, see:

- VBS Plan Overview in the VBS Plan Manual.
- VBS Editor Overview in the VBS4 Editor Manual.

1.1 Quick Start: Starting a Scenario

During Scenario Execution, the Instructor has the primary user role.

To use VBS4 as an Instructor, follow this process:

1. Start VBS4 as an Administrator.
2. Select the Scenario to Execute from the Battlespaces List.
3. Use the Network Lobby (on page 21) to manage role assignment and then start.
4. During Scenario Execution, use the Instructor Interface (on page 25) (VBS Editor in Execute Mode) to monitor simulation users, manage the scenario, and insert simulation objects, hazards, and events in real time.

For more information, see Scenario Execution (on the next page).

2. Scenario Execution

The most important VBS4 use case is the operation and administration of multiplayer training during Scenario Execution.

Start a scenario and use the VBS Editor to monitor the Trainees, manage the scenario, and insert simulation objects, hazards, and events.

VBS4 provides alternate Dedicated Server and Hosted Scenario Execution workflows:

- Dedicated Server Scenario Execution (below)
- VBS4 Client Hosted Scenario Execution (on page 15)

Trainees and additional Administrators join the scenario:

- Connecting Trainee Clients (on page 18)

Once the scenario starts, Instructors manage the scenario using VBS Editor in Execute Mode:

- Managing the Scenario (on page 19)

2.1 Dedicated Server Scenario Execution

Use the Dedicated Server Workflow to host a scenario using VBS4 running as a Dedicated Server. The Admin and Trainee Clients connect to the Dedicated Server that hosts the scenario.

Use VBS Launcher to start VBS4 on the Dedicated Server in either Online or Offline mode.

WARNING

All VBS4 Clients, Dedicated Servers, and Simulation Clients that participate in the Scenario Execution must use the same **Configuration** option:

- **Online:** When a VBS World Server is required, all computers must be **Online** connected to the same VBS World Server (`-worldServer=VWS_ipaddress_or_dnsname`)
- **Offline:** When a VBS World Server is not required, all computers must be **Offline** (`-worldServer` not specified).

Follow this process:

1. Start the Dedicated Server (on the next page)
2. **Optional:** Start Simulation Clients (on page 11)
3. Start an Admin Client (on page 12)
4. Start the Battlespace (on page 13)
5. Connect the Trainees and Start the Scenario (on page 14)

2.1.1 Start the Dedicated Server

The Dedicated Server acts as the simulation host.

Follow these steps:

1. In the **VBS4 > Server** tab, select the **VBS4 Configuration** to use:
   - **VBS4 Online Dedicated Server**

     Starts VBS4 as a Dedicated Server to act as the simulation host and with a connection to VBS World Server that streams terrain data to all connected clients and provides access to stored Battlespaces.
   - **VBS4 Offline Dedicated Server**

     Starts VBS4 as a Dedicated Server to act as the simulation host without a connection to VBS World Server. The Dedicated Server provides the terrain data.

   > **TIP**
   >
   > The **Dedicated Server** Preset in VBS Launcher sets the following default options for a Server configuration: `-server`
   >
   > For more information, see Launching with Presets in the VBS4 Administrator Manual.

2. **Optional:** To enable or disable additional Editor options for Scenario Execution, select the following options in VBS Launcher:
   - **Server > gateway** (`-gateway`)

     Enables the **Tools > Gateway GUI** options, on connected VBS4 Admin Clients, to manage VBS Gateway and Entity Mapping during a Scenario.

     For more information, see Launching VBS Gateway in the VBS Gateway Manual.
   - **Server > vbsHostNet** (`-vbsHostNet`)

     Enables the viewpoints configured by IG View Objects to be broadcast to VBS Blue IG.

     For more information, see Quick Start: VBS Blue IG with VBS4 Host in the VBS4 Administrator Manual.
3. Click **Launch Modules**.

   > **NOTE**
   >
   > If you require Clients to connect from outside the local network, disable **multicast** (`-multicast=0`) on the Host computer.

VBS4 starts as a Dedicated Server to host the Scenario.

For more information, see Dedicated Server in the VBS4 Administrator Manual.

2.1.2 Start Simulation Clients

For more demanding Scenarios with larger numbers of connected Clients, use VBS Launcher to start additional Simulation Clients on separate computers

Follow these steps:

1. In the **VBS4 > Client** tab, select the **VBS4 Configuration** to use:
   - **VBS4 Online**

     Starts VBS4 Clients and Dedicated Servers connected to a VBS World Server hosting the Whole-Earth Terrain and providing access to stored Battlespaces.

     Click **Refresh**, and select or input the IP Address of a VBS World Server.
   - **VBS4 Offline**

     Starts VBS4 Clients without a connection to a VBS World Server.
2. Input the **Server IP** of the Dedicated Server that hosts the Scenario.
3. Select the `-simulationClient` option and use the drop-down to select the Simulation Client type:
   - **0 (Simulation Client)** - Handles the simulation of units, vehicles and network objects.
   - **1 (AAR Client)** - Handles the simulation for AAR recording.
   - **2 (Simulation + AAR Client)** - Handles both.

   > **NOTE**
   > Generally, it is recommended to use SC type 1 (`-simulationClient=1`) for AAR recording rather than SC type 2.
4. Click **Launch Modules**.

VBS4 starts as a Simulation Client to handle the simulation workload instead of the Dedicated Server.

For more information, see Simulation Clients in the VBS4 Administrator Manual.

2.1.3 Start an Admin Client

Use VBS Launcher to start a VBS4 Client as an Administrator in either Online or Offline mode.

Follow these steps:

1. In the **VBS4 > Client** tab, select the **VBS4 Configuration** to use:
   - **VBS4 Online**

     Starts VBS4 Clients and Dedicated Servers connected to a VBS World Server hosting the Whole-Earth Terrain and providing access to stored Battlespaces.

     Click **Refresh**, and select or input the IP Address of a VBS World Server.
   - **VBS4 Offline**

     Starts VBS4 Clients without a connection to VBS World Server.
2. Input the **ServerIP** using the IP address or DNS name of the computer hosting the Scenario (`-connect=host_IP_address_or_DNS_name`).

   VBS4 starts and opens the Multiplayer Battlespaces panel in step 3 of Start the Battlespace (on the next page).

   > **TIP**
   >
   > Leave the **Server IP** blank to connect later.
   >
   > VBS4 starts in the Main Menu. Use the Training tab **Connect to Server** option to start the Scenario as described in step 1 of of Start the Battlespace (on the next page).
3. Select **admin**.
4. Click **Launch Modules**.

VBS4 starts as an Admin Client to manage Scenario Execution.

The Administrator that starts the Scenario Execution on the Dedicated Server is the Server Admin with additional control over the scenarios.

For more information, see:

- Server Management (on page 45)
- Server Administration Commands in the VBS4 Administrator Manual

Secondary Admins that join a Scenario Execution do not have these privileges but can assume Server Admin control using the Server Management (on page 45) **Become Server Admin** option.

2.1.4 Start the Battlespace

The Administrator starts the Battlespace from the Training tab of VBS4.

WARNING

When you Execute a Scenario, you select whether to use the version on the VBS World Server, the local VBS4 Admin Client, or the Dedicated Server. To ensure that all computers participating in the Scenario use the same version of the Battlespace, VBS4 automatically copies the selected version as follows:

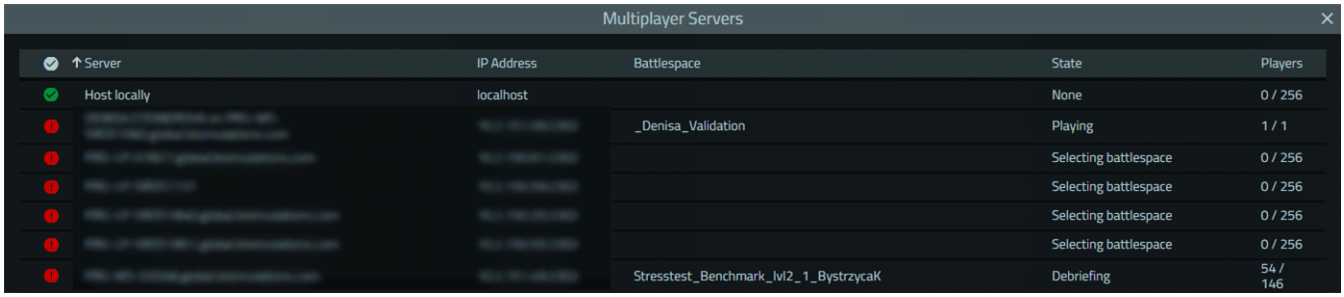
- If the VBS World Server version is used, it downloads to the VBS4 Admin Client and uploads to the Dedicated Server, overwriting any versions on those computers.
- If the local VBS4 Admin Client version is used, it uploads to the Dedicated Server, overwriting that version. The VBS World Server version is not affected.
- If the Dedicated Server version is used, no overwriting occurs and the VBS World Server and VBS4 Admin Client versions are not affected.
- When VBS4 Trainee and Admins Clients join a running Scenario they download a temporary copy of the Battlespace from the Dedicated Server and any locally stored versions of the Battlespace are not affected.

Before Battlespaces are overwritten, a prompt appears with an option to cancel.

Follow these steps:

1. If the **Server IP** was not specified, on the VBS4 Admin Client, select the Training tab, and click **Connect to Server**.

   The Multiplayer Servers panel opens, displaying the Dedicated Servers, which includes their DNS names (**Server**) and IP addresses (**IP Address**), available on the network.



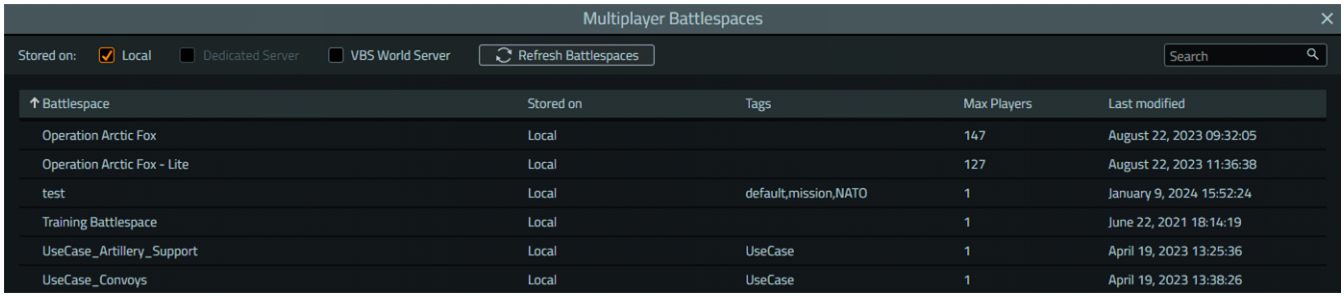
2. Select the Dedicated Server that hosts the Scenario, and click **Connect**.

NOTE

The **localhost** option is available in the Dedicated Server list to host the Scenario on your VBS4 Client instead of a Dedicated Server.

> **TIP**
>
> If the computer is not listed, click **Manual** to input the specific IP Address, or DNS name, and Port of the computer hosting the Scenario.

The Multiplayer Battlespaces panel opens displaying the Battlespaces available to execute.



3. The Multiplayer Battlespaces panel displays all the Battlespaces available to execute:
   - Battlespaces stored locally on your VBS4 Client
   - Battlespaces previously uploaded to the Dedicated Server.
   - Battlespaces stored on a connected VBS World Server.

   > **TIP**
   >
   > Use the **Stored on** checkboxes to only display the Battlespaces on the selected computers.

   Select the Battlespace to execute, and click **OK**.

VBS4 opens the Network Lobby (on page 21).

2.1.5 Connect the Trainees and Start the Scenario

Connect the Trainees to the Battlespace and use the Network Lobby to assign roles in the Scenario.

Follow these steps:

1. Start VBS4 on the Trainee Clients.

   See Connecting Trainee Clients (on page 18).

2. In the Network Lobby (on page 21), do the following:
    a. Select your own character, and allow Trainees and additional Instructors to select their characters, or assign characters to them.
    b. **Optional:** To automatically record an After Action Review as soon as the Scenario begins to execute, select **Record AAR**.
    c. **Optional:** To skip the Mission Briefing, select **Skip Briefing**.
    d. Click **OK**.
3. Allow all Trainees to review the Mission Briefing, and then click **OK** to start the Scenario.

> **NOTE**
> The Mission Briefing is not shown if **Skip Briefing** is selected in the Network Lobby (on page 21).

All connected Trainees and Instructors are taken into the Scenario with a first-person view from their character. For information about using your character, see VBS4 Trainee Overview in the VBS4 Trainee Manual.

2.2 VBS4 Client Hosted Scenario Execution

A VBS4 Admin Client can Host a Scenario for a small number of connected Trainee Clients without needing a separate Dedicated Server.

The Client Hosted workflow enables a VBS4 Client to prepare and execute a scenario in the same session without needing to restart VBS4. The Trainee Clients connect to the VBS4 Admin Client instead of a Dedicated Server.

> **WARNING**
> A Scenario Execution hosted on a VBS4 Client runs the copy of the Battlespace stored on local computer. If you have prepared the scenario online, ensure that it is synchronized. For more information, see Synchronize Battlespaces in the Introduction to VBS4 Guide.

Use VBS Launcher to start a VBS4 Client as an Administrator in either Online or Offline mode.

Follow these steps:

1. In the **VBS4 > Client** tab, select the **VBS4 Configuration** to use:
   - **VBS4 Online**

     Starts VBS4 Clients and Dedicated Servers connected to a VBS World Server hosting the Whole-Earth Terrain and providing access to stored Battlespaces.

     Click **Refresh**, and select or input the IP Address of a VBS World Server.
   - **VBS4 Offline**

     Starts VBS4 Clients without a connection to a VBS World Server.

     > **WARNING**
     > Do not select or input the **Server IP** Address to connect to a Dedicated Server.
2. **Optional:** To enable additional Editor options during Scenario Execution, select the following options in VBS Launcher:
   - **Server > gateway** (`-gateway`)

     Enables the **Tools > Gateway GUI** options, on connected VBS4 Admin Clients, to manage VBS Gateway and Entity Mapping during a Scenario.

     For more information, see Launching VBS Gateway in the VBS Gateway Manual.
   - **Server > vbsHostNet** (`-vbsHostNet`)

     Enables the viewpoints configured by IG View Objects to be broadcast to VBS Blue IG.

     For more information, see Quick Start: VBS Blue IG with VBS4 Host in the VBS4 Administrator Manual.
3. Click **Launch Modules**.

   > **NOTE**
   > If you require Clients to connect from outside the local network, disable **multicast** (`-multicast=0`) on the Host computer.
4. On the VBS4 Admin Client, do one of the following to Execute the Scenario:
   - Select your Battlespace in the Battlespaces List, and click **Host** in the Execute section of the Battlespace Functions Panel.
   - Right-click the Battlespace icon in the Whole-Earth Terrain and select **Host**.

   VBS4 opens the Network Lobby (on page 21).

   All connected Trainee Clients are also taken to the Network Lobby to join the Scenario. For more information, see Joining a Multi-Player Scenario in the VBS4 Trainee Manual.

5. Start VBS4 on the Trainee Clients.

   See Connecting Trainee Clients (on the next page).

6. In the Network Lobby (on page 21), do the following:

   a. Select your own character, and allow Trainees to select their characters, or assign characters to them.

   b. **Optional:** To automatically record an After Action Review as soon as the Scenario begins to execute, select **Record AAR**.

   c. **Optional:** To skip the Mission Briefing, select **Skip Briefing**.

   d. Click **OK**.

7. Allow all Trainees to review the Mission Briefing, and then click **OK** to start the Scenario.

   > **NOTE**
   >
   > Mission Briefing is skipped, if **Skip Briefing** is selected in the Network Lobby (on page 21).

All connected Trainees and Instructors are taken into the Scenario with a first-person view from their character. For information about using your character, see VBS4 Trainee Overview in the VBS4 Trainee Manual.

2.3 Connecting Trainee Clients

On VBS4 Trainee Clients, and additional Admin Clients, use VBS Launcher to join the Scenario.

WARNING

All VBS4 Clients, Dedicated Servers, and Simulation Clients that participate in the Scenario Execution must use the same **Configuration** option:

- **Online:** When a VBS World Server is required, all computers must be **Online** connected to the same VBS World Server (`-worldServer=VWS_ipaddress_or_dnsname`)
- **Offline:** When a VBS World Server is not required, all computers must be **Offline** (`-worldServer` not specified).

Follow these steps:

1. Start VBS4 on the Trainee Clients and additional Admin Clients in either Online or Offline mode:

   In the **VBS4 > Client** tab, select the **VBS4 Configuration** to use:

   - **VBS4 Online**

     Starts VBS4 Clients and Dedicated Servers connected to a VBS World Server hosting the Whole-Earth Terrain and providing access to stored Battlespaces.

     Click **Refresh**, and select or input the IP Address of a VBS World Server.

   - **VBS4 Offline**

     Starts VBS4 Clients without a connection to VBS World Server.

2. Do one of the following:

   - To connect directly to the Host or Dedicated Server, input the **Server IP** using the IP address or DNS name of the computer hosting the Scenario (`-connect=host_IP_address_or_DNS_name`).

     VBS4 starts and Trainees wait in the VBS4 Lobby until the Scenario starts.

   - Leave the **Server IP** blank to connect later.

     VBS4 starts in the Training Menu and Trainees use the **Connect to Server** option to join the Scenario.

3. Click **Launch Modules**.

   WARNING

   Do not select **admin** on VBS4 Trainee Clients.

VBS4 starts as a Trainee Client for participation in Scenarios.

For more information, see Joining a Multi-Player Scenario in the VBS4 Trainee Manual.

2.4 Managing the Scenario

As an Instructor with Administration access, use VBS Editor to manage the scenario:

- Press **Pause** (**Esc**) to access the VBS4 Toolbar, and select **Editor**.

VBS Editor opens in Execute Mode providing access to Scenario Execution functions.

The VBS4 Instructor Manual splits Scenario Execution functions into the following categories:

- Scenario Administration (on page 44)

  Perform overall Scenario Management functions, such as recording an After Action Review.

- Scenario Monitoring (on page 54)

  Monitor and visualize specific aspects of a Scenario Execution.

- Event Management (on page 128)

  Use specific VBS4 functionality to insert events or to provide functions such as fire support.

- Entity Management (on page 158)

  Use specific context actions to manage individual entities in the Scenario, such as Revive Unit.

> **NOTE**
>
> The VBS4 Instructor Manual focuses only on specific functionality that is only available in Execute Mode.
>
> The majority of the Prepare Mode functionality of VBS Editor and VBS Plan is also available for use in Execute Mode. For more information, see:
>
> - VBS Plan Overview in the VBS Plan Manual.
> - VBS Editor Overview in the VBS4 Editor Manual.

Specific monitoring and configuration options are available for VBS Radio and interoperable simulation using VBS Gateway - see:

- Monitoring VBS Radio (on page 70)
- VBS Gateway UI in the VBS4 Editor Manual

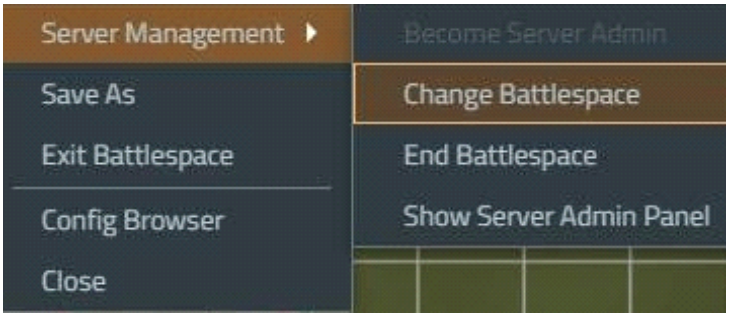
  To configure entity mapping for interoperable exercises with DIS / HLA compliant simulation products, select **Editor** and **Tools > Show Gateway GUI** to open the VBS Gateway UI.

  > **NOTE**
  >
  > Configuring entity mapping is only possible in Execute Mode.

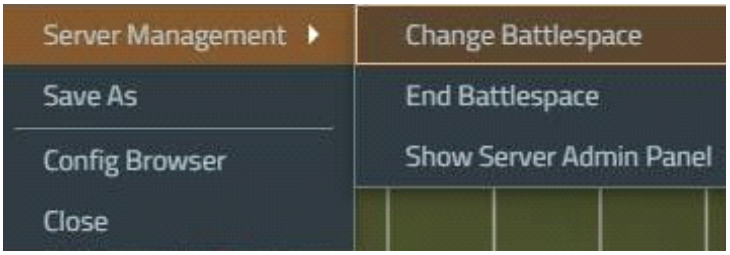
- Monitoring with VBS Gateway (on page 78)

Use the **Main Menu > Server Management** options to end or change Battlespaces:

Dedicated Server



VBS4 Client Hosted



- **Change Battlespace**

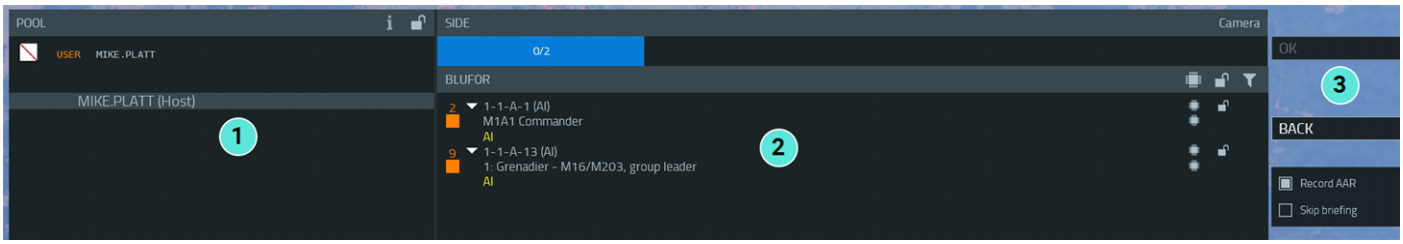
  The Scenario stops and the Server Admin returns to the Multiplayer Battlespaces panel to select a new Scenario to execute.

- **End Battlespace**

  Scenario Execution ends, and all Admins and Trainees are returned to the Network Lobby (on the next page).

3. Network Lobby

When a Scenario Execution starts, the Network Lobby opens, where Trainees and Instructors select assign characters for the Scenario.



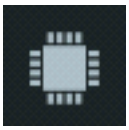
The Network Lobby contains the following elements:

1	**POOL** - Pool of available users that are connected to the server and available for allocation: • Players appear highlighted in the color of the side they are assigned to (**BLUE** for **BLUFOR**, **RED** for **OPFOR**, **YELLOW** for **Independent**, **GREEN** for **Civilian**). If a user is not assigned, they appear with no background color. • Users that are selected are highlighted with a black background. If a user is already assigned to a character, their side background color becomes brighter, to indicate they have been assigned in the Scenario. • Multiple users can be added to the current selection, by holding **Shift** or **Ctrl**, and clicking the users. • The group number is added as a prefix to the user name, in the list box.

2 This interface element consists of groups and sides:

- **GROUPS** - The groups column lists all the current available groups for the selected side that exist in the mission:
  - Each group is indicated by their group number and group name.
    - Three buttons are available per group.
    - The first button (drop-down chevron), can be clicked to expand or collapse all units that exist within that group.
    - The second button is the AI button, this toggles whether empty slots are filled with AI units or not for that group. The AI slots can be controlled by a side (clicking the AI icon in the header), a group (AI icon next to the group), or a position (AI icon next to position).
  - The third button is the group locking function. Once clicked, the group is locked and users are unable to join that group.
  - The side can be locked by clicking the padlock icon in the groups header.
  - In the expanded view, units are displayed by their position in the group and their unit class display name. The assigned status of that unit is shown directly below. If a player is assigned, their name appears in orange beneath that unit. **AI** appears in yellow, if an AI controls that unit.

    Before starting the scenario, Scenario Administrators can disable slots for Trainees during Join In Progress (JIP). To do so, click the **Enable / Disable Slot Icon** at the unit level, or for all the slots in the scenario.

    NOTE

    The following considerations apply:

    - A disabled slot appears as **Nobody** to Scenario Administrators and Trainees before scenario start.
    - **Nobody** slots that were empty before scenario start are not created (and are not visible) to Scenario Administrators or Trainees to select from during JIP.
  - Once a selection is made within the player pool, that selection can be dragged into the groups column and placed onto any group. This causes all players to be auto-assigned to that group, until the group is full or there are not enough players to fill the rest of the slots.
  - Any players that are not assigned to a slot maintain their selected status in the player pool. This makes it easy to distribute the remaining players to other groups.
  - Players can be dragged onto individual slots in order to assign them to that slot. If they are part of a group selection, they are removed from the selection once they are assigned.

- **SIDE** - All sides are shown in the sides list. Click a side to display the side groups in the Groups listing. Each side shows how many players are assigned to it, along with the maximum number of slots available in the mission for that side. Group selections can be dragged onto one of these sides in order to auto-assign the entire selection to the side.
  - **BLUE** - BLUFOR
  - **RED** - OPFOR
  - **YELLOW** - Independent
  - **GREEN** - Civilian
- **Mission Description** - Click the mission name in the top-right corner to display the mission description.

3 The following menu options are available:

- **OK** - Goes to the Mission Briefing screen or Scenario execution (if **Skip Briefing** is checked).
- **BACK** - Goes to the Host Server screen.
- **Record AAR** - Automatically starts recording an After Action Review. For more information, see After Action Review (AAR) in the VBS4 AAR Manual.
- **Skip Briefing** - Skips the Mission Briefing, and goes directly to Scenario execution.

> **NOTE**
>
> The **Record AAR** and **Skip Briefing** options are available to all users hosting a Battlespace, providing that the **Can Host MP Session** is enabled (see Simulation Settings in the VBS4 Administrator Manual), otherwise they are grayed-out.

3.1 Assigning Roles

Assign users to roles by selecting them and then dragging the user name from the **POOL** to an available role. Alternatively, you may select a name, and then click the role you want to assign that user to.

By default, the Scenario Administrator can assign any user to any role, while individual users may only assign their own role.

Instructors (users starting VBS4 as an Admin Client) can manage the locking / unlocking of squads. However, they do not have the ability to lock the Scenario, as that is reserved for the Scenario Administrator.

When ready, click **OK** and after loading, either the multiplayer briefing screen opens or the multiplayer session starts.

3.2 Dedicated Server Commands

The server administrator of a Dedicated Server can control the server using typed commands. Generally, the first VBS4 administrator to log in gets assigned the server administrator role. Common server commands include:

Command	Description
#missions	Select mission.
#reassign	Restarts the mission over and reassigns roles. **NOTE** Use this instead of the deprecated `#restart` command.
#shutdown	Shuts down the server.
#monitor (interval in sec)	Shows performance information of the server. Interval 0 stops monitoring.

See Dedicated Server in the VBS4 Administrator Manual for a full list of commands and more information on managing a Dedicated Server.

NOTE

Administrators have additional Main Menu options in the Network Lobby.

For more information, see Server Management (on page 45).

4. Instructor Interface

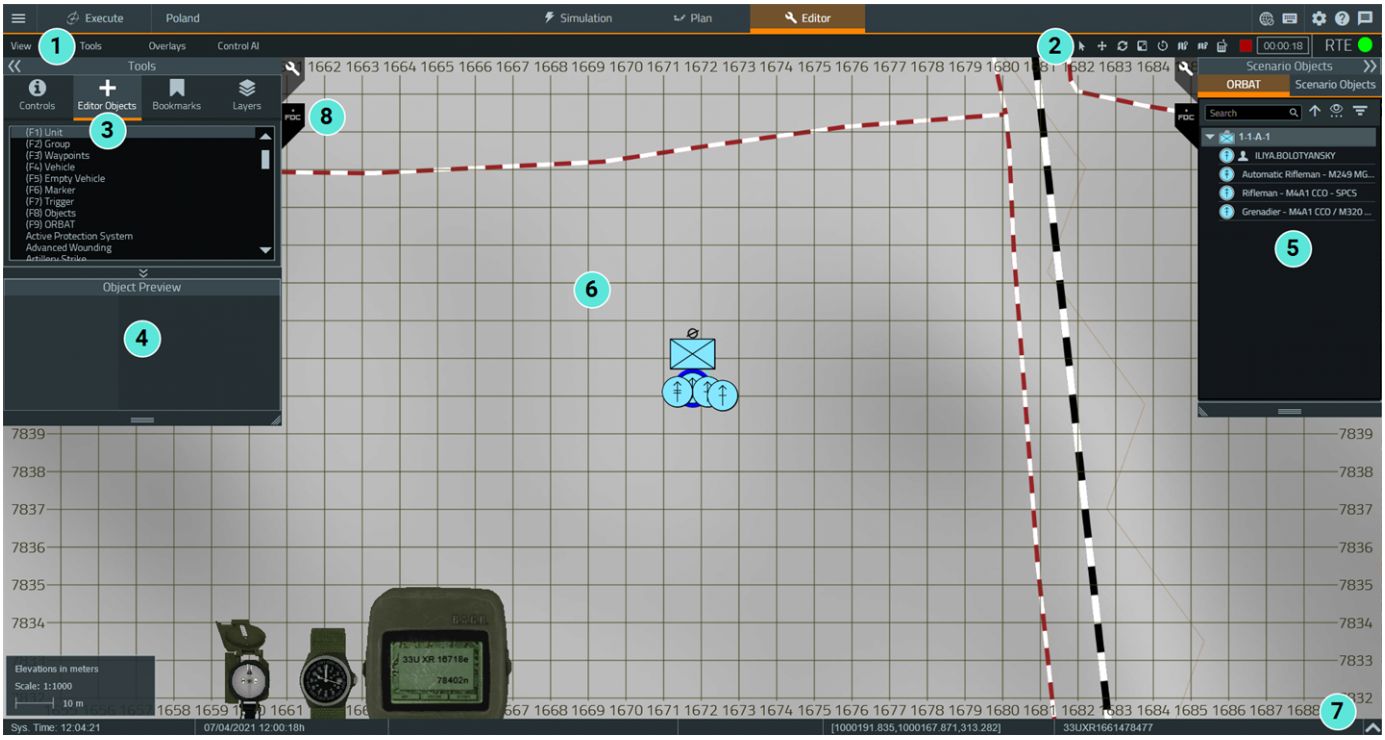
After a Scenario starts, the Instructor uses VBS Editor in Execute Mode to manage the Scenario.

- From the Scenario Execution, press **Pause** (**Esc**) to access the VBS4 Toolbar, and select **Editor**.

> **NOTE**
>
> The simulation does not pause, unless you are in Preview Mode or Single Player Training.

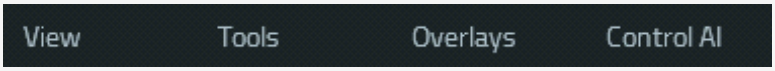
VBS Editor opens in Execute Mode, focused on your location, enabling you to administer the Scenario.

> **NOTE**
>
> VBS Editor in Preview Mode also uses the Instructor Interface with some exceptions.



1 Editor Menu

The Editor Menu provides access to specific Editor functions.



Click a menu item to view its options, and then click an option to select it.

For more information, see Editor Menu Options (on the next page).

> **NOTE**
>
> The menu options vary depending on your VBS4 deployment, licensing, start options, and editor mode.

2 Editor Toolbar

Click the icons in the header to access specific Editor Tools (on page 38).

Click the **Red** Button to start and stop AAR Recording.

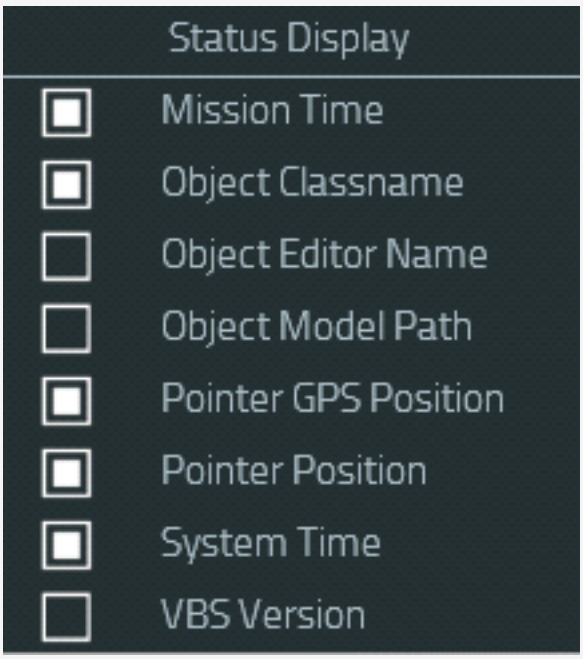
For more information, see Recording Scenarios for AAR (on page 51).

3 Tools Panel

The main panel on the left contains a set of tabs to add and manage objects in the scenario.

Icon	Tab	Description
	Controls	Displays the available keyboard shortcuts. The Controls content is context sensitive and changes according to the selected object and action being performed in the Editor.
	Editor Objects	Use the Editor Objects List to select the type of entity / object you want to add to the scenario, see Using Editor Objects.
	Bookmarks	Use this tab to create timed event markers during a scenario, and to jump to a bookmark during review (AAR).
	Layers	Use this tab to organize objects in the scenario. For more information, see Layers and Overlays.

> **TIP**
>
> Click **Tool** icon to minimize or maximize the Tools Panel. Resize the panel by dragging the bottom-right corner.

4	**Object Preview**	Use the arrows to open and close the Object Preview. Place the cursor over an entity / object in the 2D map, 3D terrain, or the Scenario Objects Panel to view an image of the entity / object, and basic details.
5	**Scenario Objects Panel**	The Scenario Objects Panel lists the Editor Objects in the Scenario, including any ORBAT hierarchies and enables access to individual Editor Object functions. For more information, see Scenario Objects Panel (on page 40).
6	**2D / 3D Map View**	VBS Editor can switch between a 3D Camera View or a 2D Map View of the Scenario. The views are configurable, and enable placement of Editor Objects and interaction with them. For more information, see Instructor Views and Perspectives (on page 55).
7	**Status Footer**	Displays status information. Click the arrow in the bottom-right to select which items to display in the footer. 
8	**FDC Tab**	Opens the Fire Direction Center UI (FDC) which is used to configure VBS Call for Fire scenarios. For more information, see the VBS Call for Fire - FDC UI in the VBS Call for Fire Manual.

4.1 Editor Menu Options

The Editor Menu provides the following options to Instructors during Scenario Execution:

- VBS4 Main Menu for Scenario Execution (on the next page)
- View Menu Options (on page 33)
- Tools Menu Options (on page 35)

- Overlays Menu Options (on page 37)
- Control AI Menu Options (on page 38)

4.1.1 VBS4 Main Menu for Scenario Execution

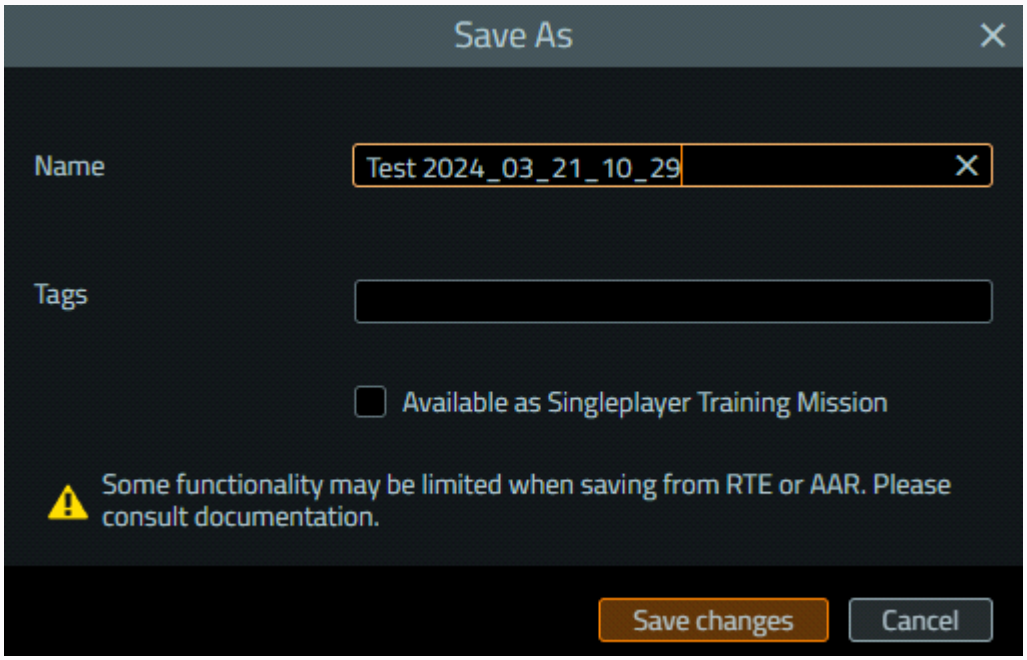
In this release of VBS4, the following Editor options are available under the VBS4 Main Menu.

Click the **Main Menu** icon to expand the following options:

Editor Menu Option	Description
Server Management	Options to **Become Server Admin** and manage the Scenario Execution. For more information, see Server Management (on page 45).

Editor Menu Option	Description
Save As	Enables you to create a new Battlespace from the one you are running, in its current state. The **Save As** dialog opens with a unique Battlespace name already assigned in the **Name** field. This name consists of the original Battlespace name, followed by the date and time.

EXAMPLE



Follow these steps:

1. To change the name of the Battlespace, enter a new name in the **Name** field.

   WARNING

   Do not make the name the same as the original Battlespace name. Otherwise, you receive the following error message: **Cannot overwrite the active battlespace**.

2. Add Battlespace Tags:
   - Input a Tag name and press **Comma**, **Enter**, or **Tab**. Continue typing to create another one.
   - To remove a Tag, click **X**.
3. Select **Available as Singleplayer Training Mission** to make the Battlespace available to Trainees in the Training mode (see Single Player Training in the VBS4 Trainee Manual).
4. Click **Save Changes**.

Editor Menu Option	Description
	The scenario is saved as a new Battlespace. For information about what is saved to the new Battlespace, see Save As in Execute Mode (RTE) (below).
Config Browser	Open the VBS Configuration Browser. For more information, see Configuration Browser in the VBS Developer Reference.
Close	Close the Editor UI and return to controlling your character in the Scenario.

Save As in Execute Mode (RTE)

The **Save As** option causes the following functionality to be saved to the new Battlespace when saving from **Execute Mode (RTE)**:

> **NOTE**
> The functionality saved may differ to what is saved when using **Save As** in AAR. For more information, see Creating a Battlespace from the AAR in the VBS4 AAR Manual.

General

- Entity positions and orientations.

Entity Health

- For units, the total health (%) (individual damage per body-part is not saved).
- For vehicles, the total health (%) and damage (including charring) to individual hit points.
- Advanced Wounding:
  - Configuration of the Advanced Wounding Editor Object, and links to entities.
  - Wounds sustained by units.

Unit Inventory

- State of the unit inventory at the time of saving (including UCS weapons).
- Ammunition count accurate to the number of magazines (the current number of bullets in individual magazines is not saved).

Vehicle Inventory

> **WARNING**
> Loadouts configured for new vehicles in Execute Mode (RTE) are not retained. Configure new vehicle loadouts during in Prepare Mode (OME).

- State of the vehicle inventory at the time of saving (including base UCS weapons, but without attachments).
- Ammunition is saved as a percentage of total ammunition (across all weapons).
- Equipment Tools and Objects including CREW, LWR, Electronic Warfare, APS (with configuration, links, and states intact).
- Most bridging vehicles, such as the Titan and ABLE - deployed bridges are saved on the map, and vehicles start without the bridge part if they deployed it in the original Battlespace scenario.

> **NOTE**
>
> Known issues with specific bridging vehicles, such as the BroBv120 will be addressed in future releases.

Terrain Effects

- Craters. Only large / permanent craters. Small / temporary craters, like those created when using heavy machine guns, for example, are not saved. The position and size of large / permanent craters is saved.
- VBS Geo edits.

Weather and Time of Day

- Weather related settings configured in Weather Settings.
- The Time of Day for the new Battlespace is set to the time that the **Save As** option was selected.

VBS Radio

- All VBS Radio configuration.

Damage Charring

- Damage charring for vehicles and objects.

UAV Control Links

- Control Links assigned to UAV vehicles.

Electronic Warfare

- Providing that they are linked to vehicles, all Electronic Warfare EOs and their settings.

Waypoints

- Waypoints, including any synced to Triggers.

Triggers

- Triggers Editor Objects, including configuration, and links to other objects.
- Triggers that are set to fire only once (they do not trigger again after loading if they have triggered previously).

VBS Plan

- All of the VBS Plan shapes are saved and are visible. The phase line timings are also saved (including waypoints, because they are regular Waypoints).

4.1.2 View Menu Options

In the Editor Menu, click **View** to expand the following options:

View Menu Option	Description
2D Map View **3D Camera View**	Switch between the 2D Map and 3D Camera View of the Scenario. For more information about Views, see Instructor Views and Perspectives (on page 55).
Command View	Similar to 3D Camera View, but with Commanding Subordinates controls. **NOTE** Only available in C2 mode.
FOV Settings	Display a visualization of individual unit perspectives, indicating their Field of View. For more information, see Field of View Visualization (on page 63).
Ink-Spot Settings	Display a visualization of individual unit or vehicle activity, indicating whether they have stopped moving. For more information, see Ink-Spot Visualization (on page 65).
Map Settings	Control the appearance and content of the Map for Trainees using C2 Mode. For more information, see Map Settings in the VBS4 Editor Manual.
Editor Settings	Modify Editor UI display settings. For more information, see Editor Settings (on page 39).
Show Conversations	Monitor or participate in a conversation with a Trainee using intelligence Reports (see Intelligence Reports in the VBS4 Trainee Manual).
Show / Hide Laser Target Lines	Displays the laser lines, when Laser Designators are used by units (for example, JTACs) to mark targets. **NOTE** The following considerations apply: • **Shown** - Visible laser lines in the 2D View, PRF (Pulse Repetition Frequency) code in the 2D View, target markers in the 2D and 3D Views. • **Hidden** - Visible target markers in the 2D View. For more information, see Laser Target Line Visualization (on page 67).
Show / Hide Hit Lines	Display a visualization of weapons fire. For more information, see Hit Line Visualization (on page 68).

View Menu Option	Description
Show / Hide Trails	Display a visualization of recent unit movement, indicating their paths over the last minute. For more information, see Trail Visualization (on page 69).
Show / Hide Texture	Display surface textures in the 2D Map View. **NOTE** Requires the visibility of the `satelliteTexture` map layer (VBS4 satellite data) to be switched on. For more information, see Map Layer Elements and Layers Tab in the VBS4 Editor Manual.
Enable / Disable Shaded Relief	Display elevation changes in the 2D Map View. **NOTE** The following considerations apply: • This option is only available, if surfaces textures are hidden, using **Hide Texture**. • Requires the visibility of the `shadedRelief` map layer (VBS4 elevation data) to be switched on. For more information, see Map Layer Elements and Layers Tab in the VBS4 Editor Manual.
Show / Hide Briefing	Show / hide the Mission Briefing. For more information, see Show / Hide Briefing in the VBS4 Editor Manual.
Show / Hide GPS	Display the GPS device.
Show / Hide 3D Icons	If **Show 3D Icons** is selected, Unit Symbology Markers are shown above entities / objects in 3D Camera View.
Camera Collision On / Off	If **ON**, the 3D camera can clip through the terrain.
Units with Advanced Wounding...	Select to open the Units With Advanced Wounding list, see Advanced Wounding in the VBS4 Editor Manual.
More... > Unit Symbol Configuration	Select to open the Unit Symbols dialog (see Customizable Symbology in the VBS4 Editor Manual).
Exaggerated View Mode	Select to open the Exaggerated View dialog. For more information, see Exaggerated View in the VBS4 Editor Manual.

4.1.3 Tools Menu Options

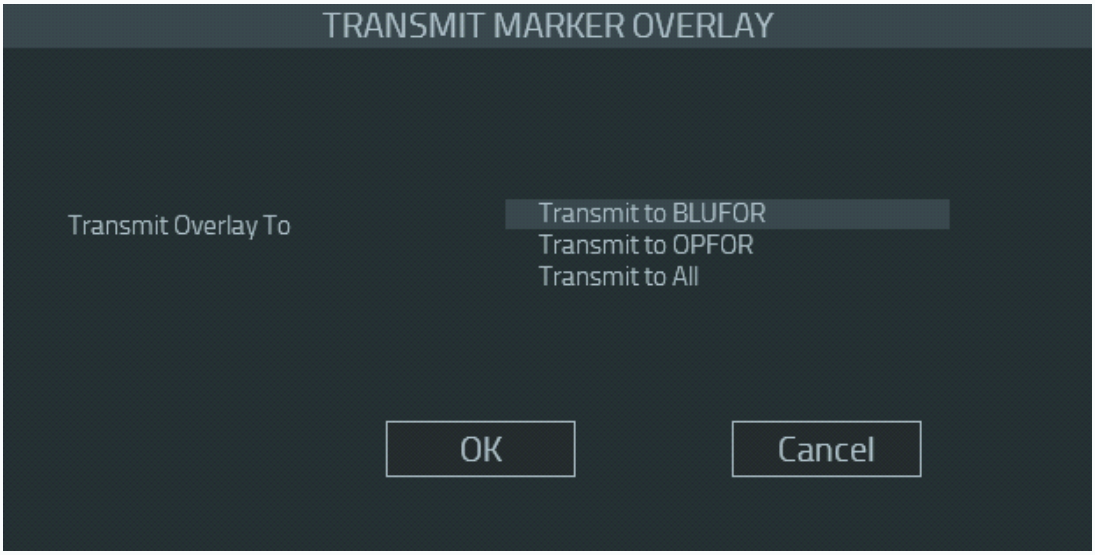
In the Editor Menu, click **Tools** to expand the following options:

Tools Menu Option	Description
Scenario Settings	Change overall settings for the Scenario. For more information, see Define Scenario Settings in the VBS4 Editor Manual.
Weather Settings	Change weather, cloud, and sea settings. For more information, see Weather Settings in the VBS4 Editor Manual.
Atmospheric Parameters	Set specific Atmospheric Parameters for display to Players in the Atmospheric Parameters HUD. For more information, see Atmospheric Parameters in the VBS4 Trainee Manual.
Instructor Operator Station	Open the companion VBS Instructor Operator Station application to monitor the scenario. **FEATURE NOTICE** VBS IOS is not included with VBS4. For more information, contact support@bisimulations.com.
Developer Console	Open the Developer Console to enable the execution of SQF scripting, and the reading and assigning of variables. For more information, see Developer Console in the VBS4 Scripting Manual.
ORBAT Editor	Opens the ORBAT Editor dialog. For more information, see ORBAT Editor in the VBS4 Editor Manual.
Measure Distance	Opens the Measure Distance Tool to measure the distance between two points. For more information, see Measure Distance Tool in the VBS4 Editor Manual.
Switch to C2	Change the Editor Interface to Command and Control Mode (C2) to replicate the Map View available to Trainees during Scenario Execution. For more information, see Command and Control (C2) Screen in the VBS4 Trainee Manual. Select **Tools > Switch to RTE** to exit C2 Mode.
Show / Hide Toolbar	Toggle the Editor Tools (on page 38) on and off.
Show / Hide Status Bar	Toggle the Status Footer (on page 27) on and off.

Tools Menu Option	Description
Undelete Map Objects	Legacy VBS3 functionality that does not apply to VBS4.
Enable Record Path Hot Key	Enables a mode for recording vehicle paths. For more information, see Vehicle Path Recording (VPR) in the VBS4 Editor Manual.
Pause	Pauses the scenario, all participants freeze.
Reference Documents	Display any available Reference Documents in the VBS4 Editor Manual.
Send Form	Opens the Send Form dialog, where you can use an existing form in the list and transmit it across the network. For more information, see Filling-In and Sending a Form in the VBS4 Trainee Manual.
Create Form	Opens the Form dialog, which is used to create form templates that can be sent across the network. Trainees use the forms to create and send reports, orders, request support, and so on. For more information, see Creating a Form in the VBS4 Trainee Manual.
List Forms	Opens a dialog with a list of completed forms, for more information see Completed Forms in the VBS4 Trainee Manual.
IG View Editor	Modify the configuration of IG Views for integration with Image Generation products. For more information, see Add IG Viewpoints to Scenarios in the VBS4 Editor Manual.
Logistics Report	Open the Logistics Report, displaying the status of units and vehicles in the Scenario.
Export Map	Export the currently visible region of the map as a QGIS project. For more information, see Map Export in the VBS4 Editor Manual.

4.1.4 Overlays Menu Options

In the Editor Menu, click **Overlays** to view the following options:

Overlays Menu Option	Description
New Marker Overlay	Add sets of military markers to the map and then transmits them to other participants in the Scenario. For more information, see Adding Markers in the VBS4 Editor Manual. **NOTE** When an Instructor commits a Marker Overlay during Scenario Execution, a prompt displays to select which side to transmit the overlay to. Only members of the selected side and other administrator users see the new markers. 
Load Mission Marker Overlay	Load a previously saved Marker Overlay.
New Object Overlay	These options enable the Instructor to create and inject a set of Editor Objects into a Scenario together instead of having each object immediately appear in the Scenario as it is created. For more information, see Object Overlays in the VBS4 Editor Manual.
Load Mission Object Overlay	

4.1.5 Control AI Menu Options

In the Editor Menu, click **Control AI** to expand the following options:

File Menu Option	Description
Reload Behaviors	Reloads behaviors when they are updated.
AI Debug Panel	Open the Control AI Debug Panel and select visualizations to display.
Hide AI Debug	Switch the Control AI Debug visualizations off. To switch them on again, select **AI Debug Panel**.

For more information, see Control AI Menu in the VBS Control AI Manual.

4.2 Editor Tools

The Editor Toolbar enables the manipulation of Editor Objects and the 2D Map Scale.

Icon	Description
	Default select / normal mode. Enables you to select entities / objects.
	Object move mode. Enables you to move entities / objects.
	Object rotate mode. Enables you to rotate entities / objects.
	Object scale mode. Enables you to scale the object size.
	Set the mission time of day.
	Map scale zoom in. Enables you to zoom the map in (changes the map scale). **NOTE** If the terrain is configured for discrete map scales and the current map scale is within the predefined range, the map scale is shown when the Tools panel is minimized.
	Map scale zoom out. Enables you to zoom the map out (changes the map scale).

Icon	Description
	Access the VBS Radio user interface. For more information, see Monitoring VBS Radio (on page 70).

For more information about manipulating Editor Objects, see Interacting with Editor Objects in the VBS4 Editor Manual.

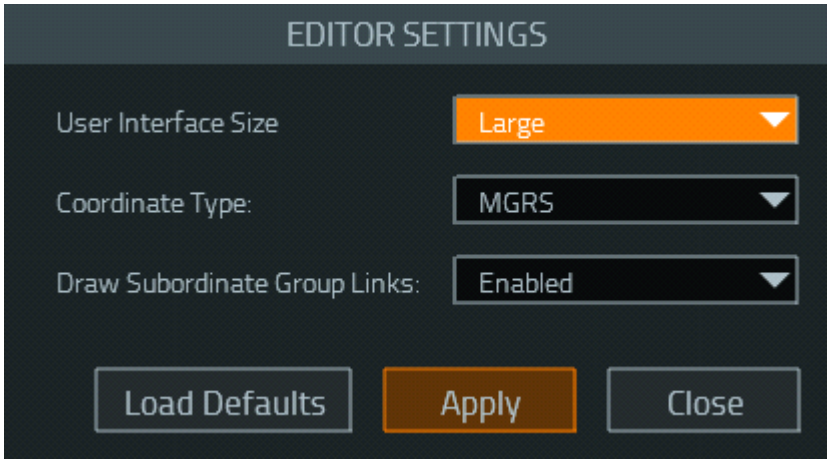
4.3 Editor Settings

Editor Settings enables you to change Editor display settings in both Prepare and Execute Modes.

Follow these steps:

1. In the Editor Menu, expand **View** and select **Editor Settings**.

   The Editor Settings dialog opens.



2. Modify the Editor Settings as required.

Settings	Description
User Interface Size	Select the display size of the font and icons in the Editor UI.
Coordinate Type	Select the coordinate type to display in the 2D Map View grid and the Status Footer.
Draw Subordinate Group Links	Select whether to display lines linking groups within an ORBAT hierarchy.

3. Click **Apply Changes** and **Close**.

VBS4 applies the selected settings to the Editor UI.

Click **Load Defaults** to reset the Editor Settings to their default settings.

4.4 Scenario Objects Panel

This panel has two tabs.

Tab	Description
ORBAT	Order of Battle (ORBAT). Shows the hierarchical structure of entities / objects in the scenario, including their respective symbology icons. Filtering always shows the entire list of entities / objects linked with the units, vehicles, UAVs linked with groups, echelons, and waypoints that they are filtered with. For more information, see Filtering (on page 42).
Scenario Objects	Shows only entities in the scenario, listed under their parent categories, including their respective symbology icons. Filters function without limitations (see Filtering (on page 42)).

The Scenario Objects panel and the ORBAT / Scenario Objects tabs have the following functions:

- Click the **Tools** tab to expand / collapse the panel.

- Drag the bottom-left corner of the Scenario Objects panel to resize it.
- Use the arrows to expand / collapse category lists:
  - Click the **Expand / Collapse All** icons to expand / collapse all the category lists.

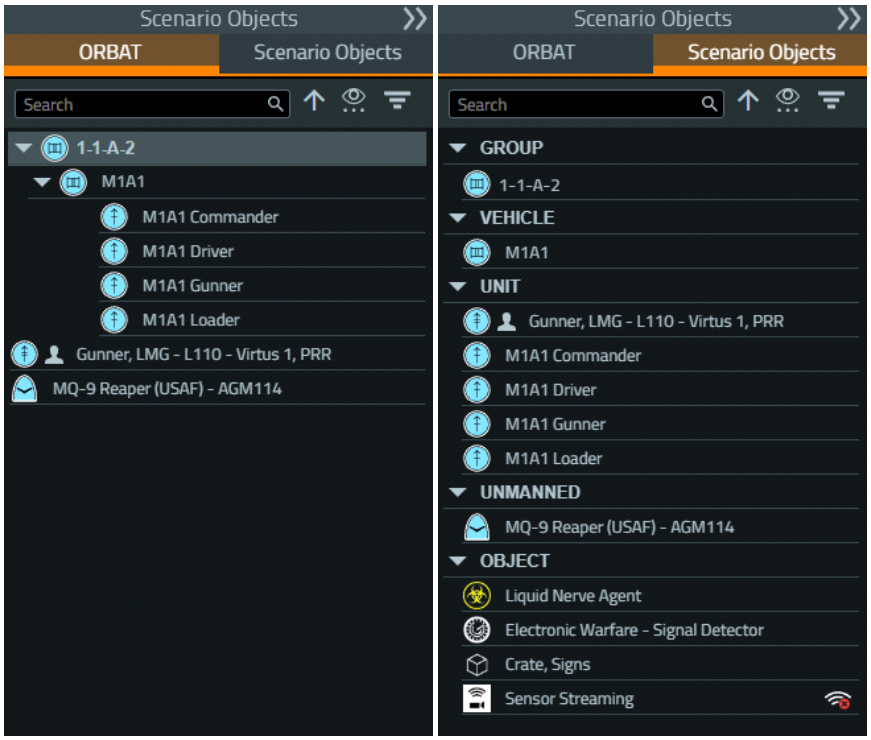
    

  - Click the **Expand / Collapse Selected** icons to expand / collapse a specific category list.

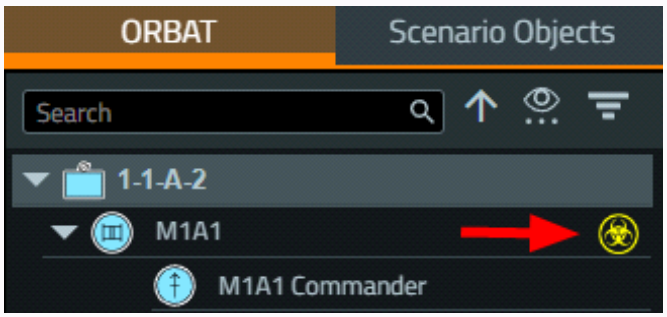
- Right-click individual entities / objects to access context menu options.
- If there is an Autonomous Vehicle (AV) in the scenario, AV symbology together with the name of the AV is shown in the ORBAT tab and the UNMANNED category of the Scenario Objects tab.
- If the Sensor Streaming EO is used in the scenario, the Sensor Streaming icon together with a radio wave indicator is shown in the OBJECT category of the Scenario Objects tab. For more information, see UAV Video Streaming in the VBS4 Editor Manual.

- If the Electronic Warfare EO is used in the scenario, the Electronic Warfare icon is shown in the OBJECT category of the Scenario Objects tab. For more information, see Electronic Warfare in the VBS4 Editor Manual.
- If the Hazardous Area EO is used in the scenario, hazard symbology is shown together with the CBRN substance type in the OBJECT category of the Scenario Objects tab. For more information, see Hazardous Area Symbology in the VBS4 Editor Manual.



Once in Execute Mode (RTE), hazard symbology appears next to contaminated entities in both the ORBAT and Scenario Objects tabs.

EXAMPLE



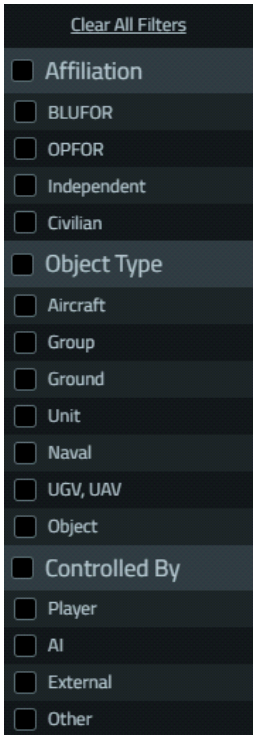
4.4.1 Filtering

You can use various filter functions in the ORBAT / Scenario Objects tabs to find entities.

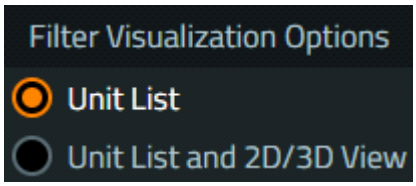
> **NOTE**
>
> If filtering is applied in the ORBAT tab, Objects are not affected, only Units, Groups, Vehicles, and Waypoints. If filtering is applied in the Scenario Objects tab, everything is affected.
>
> If the **BLUFOR** option is selected in the filter list in the ORBAT / Scenario Objects tab, Objects (such as: buildings, crates, markers, and so on) are not filtered out.

Do one of the following:

- Enter the name of the entity you are looking for in the **Search** field.
- Click the **Open Filters** icon to open the filter list and check the box next to the specific **entity** or **category** (**Affiliation**, **Object Type**, **Controlled By**) you want to filter.



- Click the **Filter Visualization Options** icon to filter the visibility of entities in the ORBAT / Scenario Objects tabs and on the 2D Map / in 3D Camera View.



  Select one of the following options:

  - **Unit List** - Shows only filtered entities in the ORBAT / Scenario Objects tab.
  - **Unit List and 2D / 3D View** - Shows only filtered entities in the ORBAT / Scenario Objects tab and on the 2D Map / in 3D Camera View.

> **NOTE**
> Entities / objects that are selected on the 2D map remain visible in the ORBAT and Scenario Objects tabs, even if they are filtered out.

Empty Vehicle Behavior

The following events occur with regard to empty vehicles and Civilian entities, when using the filter list (opened using the Open Filters icon).

- If a Civilian unit enters an empty vehicle of a different side (BLUFOR, OPFOR, Independent), and you check the relevant box in the filter list:
  - **Civilian** - The Civilian unit is visible on the map and in the ORBAT / Scenario Objects tab list.
  - **BLUFOR** / **OPFOR** / **Independent** - The BLUFOR / OPFOR / Independent unit is visible on the map and in the ORBAT / Scenario Objects tab list.
- If a unit of a side other than Civilian enters a vehicle of another affiliation, for example, a BLUFOR unit enters and OPFOR vehicle, and you check the relevant box in the filter list:
  - **BLUFOR** - The BLUFOR unit is visible on the map and in the ORBAT / Scenario Objects tab list.
  - **OPFOR** - The OPFOR vehicle is not visible on the map or in the ORBAT / Scenario Objects tab list.

5. Scenario Administration

Instructors control the overall administration of the Scenario Execution, including the following functions:

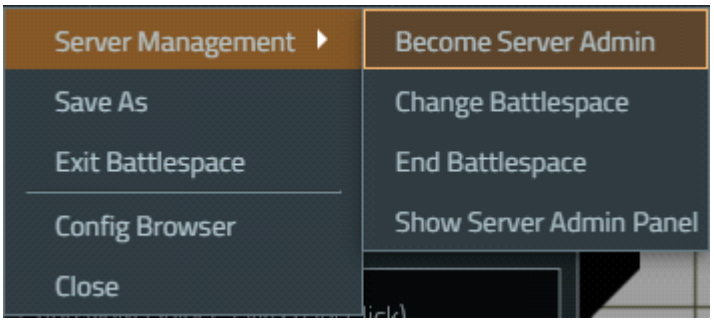
- Server Management (on the next page)
- Recording Scenarios for AAR (on page 51)
- AAR Bookmarks (on page 53)

5.1 Server Management

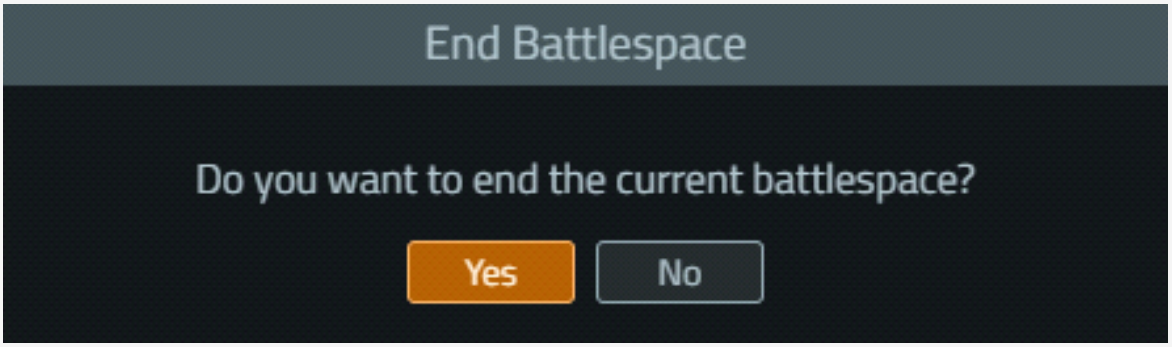
During multiplayer scenario execution, Administrators (Admins) have additional Battlespace management options that they can access from the Main Menu.

Press **Pause** (**Esc**) to access the VBS4 Toolbar, and click the **hamburger** icon to open the Main Menu.

Select **Server Management** to access the following options:



Option	Description
Become Server Admin	Select to assume control and become the Server Admin (*Game Master*).
Change Battlespace	Select to abort the current scenario execution. **NOTE** Enabled for Server Admins only. The scenario stops: • You can return to the Multiplayer Battlespaces panel to select a new scenario to execute. • All Trainees and secondary Admins return to the Server Connection status, and wait for the Server Admin to start the new scenario, which opens the Network Lobby (on page 21).

Option	Description
End Battlespace	Select to abort the current scenario execution. **NOTE** Enabled for Server Admins only. The following dialog opens:  After confirmation, the scenario stops and all users are returned to the Network Lobby (on page 21).
Show Server Admin Panel	Select to open the Server Admin Panel (on the next page). **NOTE** Enabled only for Server Admins on a Hosted Server, but for all for all administrators on a Dedicated Server. This panel is shown automatically in the Network Lobby (on page 21), **Loading to Mission Briefing** screen, and **Loading to Scenario** screen during multiplayer mission startup. Click the double-arrows to resize the panel.  Click the up / down arrows to collapse / expand the panel. 

5.1.1 Server Admin Panel

The Server Admin Panel shows the following information:

1	**Battlespace**	Name of the Battlespace.
2	**Participants**	Total number of clients (administrators and users) in the mission.
3	**Server Uptime**	Time the server has been running.
4	**Admins**	Number of administrators.
5	**Radio**	The first icon / button indicates if VBS Radio is enabled / disabled in the current mission. The second icon / button indicates whether or not automatic tests are running in the background. Automatic tests gather status information about VBS Radio infrastructure / clients. See also: Radio Icons / Buttons (on page 49)
6	**Radio Network**	The first icon / button indicates the VBS Radio administrator server status. The second icon / button indicates the status of the Runtime Infrastructure (RTI). See also: Radio Icons / Buttons (on page 49)

7	**Players (*0 / 0*)**	Lists players (clients) in the mission. The numbers inside the brackets indicate: (*clients in Execute Mode / clients connected to the VBS server*). **TIP** Use the **Search** field to search for specific players (clients). The Players section has the following columns: • **Name** - Player names. • **State** - Current reported state of VBS for each player (client). • **IP Address** - IP addresses of all connected players (clients). • **FPS** - Frames Per Second (FPS) status of all connected players (clients). **NOTE** "N/A" for a Dedicated Server is expected. • **Radio** - Icons / buttons indicate the individual connection status of VBS Radio for players (clients). • **Actions** - Click **Kick** to remove specific players (clients), especially non-responsive players (to make the mission load for everyone else).

8	**Servers (*0 / 0*)**	Lists servers in the mission. The numbers inside the brackets indicate: (*server or sim clients in the mission / servers or sim clients connected*).

TIP

Use the **Search** field to search for specific servers.

The Servers section has the following columns:

- **Name** - Server names.
- **State** - Current reported state of VBS for each server.
- **IP Address** - IP addresses of all connected servers.
- **FPS** - Frames Per Second (FPS) status of all connected servers.

NOTE

"N/A" for a Dedicated Server is expected.

- **Radio** - Icons / buttons indicate the individual connection status of VBS Radio for servers.
- **Actions** - Click **Kick** to remove specific servers

NOTE

Server Admins can also manage servers using server commands. For more information, see Server Administration Commands in the VBS4 Administrator Manual.

Radio Icons / Buttons

These icons / buttons show the status of various VBS Radio functions. Some icons / buttons can be clicked to show available recovery actions for troubleshooting. For more information see VBS Radio Troubleshooting in the VBS Radio Manual.

The following status icons / buttons can be observed:

TIP

Hover your cursor over the icons / buttons to reveal tooltips, with information about icon / button functions, statuses, and errors.

Icon / Button	Description
	VBS Radio is disabled in the current mission. No other VBS Radio icons / buttons are shown in the Server Admin Panel.

Icon / Button	Description
	VBS Radio is enabled / running, including: • VBS Radio is running on the server. • The current hosted mission has VBS Radio enabled. • Automatic tests are running in the background.
	Error or client is currently not responding. Refer to the corresponding tooltip to establish the specific error type (see Radio Error Tooltips (below)).

Radio Error Tooltips

The following error tooltips indicate potential issues with VBS Radio.

Tooltip	Description
Data error on client	Client is missing radios / channels.
Connection error on client	Client cannot talk / listen.
Data error on Admin Server	Mission is either not deployed or there are permission issues.
Connection error on Admin Server	Admin server is not running / not reachable.
Connection error on pRTI	pRTI is not running / not reachable.

5.2 Recording Scenarios for AAR

If AAR is enabled, AAR recording starts in Execute Mode once a scenario is in progress.

Recording can be started from the Network Lobby by selecting the **Record AAR** option (see Network Lobby in the VBS4 Instructor Manual), or by using the Recording Controls (below) in the VBS Editor. AAR recordings are stopped in the VBS Editor. For more information about the VBS Editor, see Mission Designer Interface in the VBS4 Editor Manual.

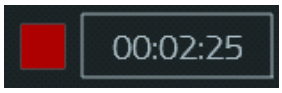
> **NOTE**
>
> AAR recording can be started and stopped by any Administrator participating in a scenario, and Trainees who are using the host computer.

This topic discusses the following AAR functions:

- Recording Controls (below)
- Saving the AAR Recording File (on the next page)

5.2.1 Recording Controls

When you are in **Execute Mode**, the AAR recording button and timer is located at the top-right of your screen.

Recording Control	Description
Record 	Click the **red** circular button to start recording. **NOTE** If the **Record AAR** option is selected in the Network Lobby, there is no need to click this button in the VBS Editor, since the recording starts automatically when the scenario begins.
Stop 	Click the **red** square button to stop recording.

You can stop and start recording multiple times within the same scenario.

> **WARNING**
>
> Do not add or edit higher echelon command structures during AAR recording, as this affects the visibility of groups, and may impact the usability of the recording.

5.2.2 Saving the AAR Recording File

Saving AAR recordings is done using the AAR Recording dialog. Click the **stop** button, to open the dialog.

Image-1: AAR Recording dialog

Enter a name for the AAR recording, and click **Save**.

AAR recording files are saved to the VBS4 Admin Client that requests the save at the following location:

`\Documents\VBS4\Battlespaces\Battlespace_Name\AAR\`

If the **Record AAR** option is selected prior to starting the mission, the AAR recording is saved to the VBS4 Admin Client that started the mission.

> **NOTE**
>
> When a scenario is hosted locally, AAR recordings stay on the computer hosting the scenario, regardless of where the recording is stopped.
>
> The status of AAR recordings (shown in the Recording Controls (on the previous page)) is synchronized across all connected clients.

AAR recordings can be uploaded to the VBS World Server and then downloaded and replayed on any VBS4 Client. For more information, see Synchronize Battlespaces in the Introduction to VBS4 Guide.

> **NOTE**
>
> If you exit a mission without saving the AAR file, it is automatically saved as:
>
> `[Date] LastMission`

5.3 AAR Bookmarks

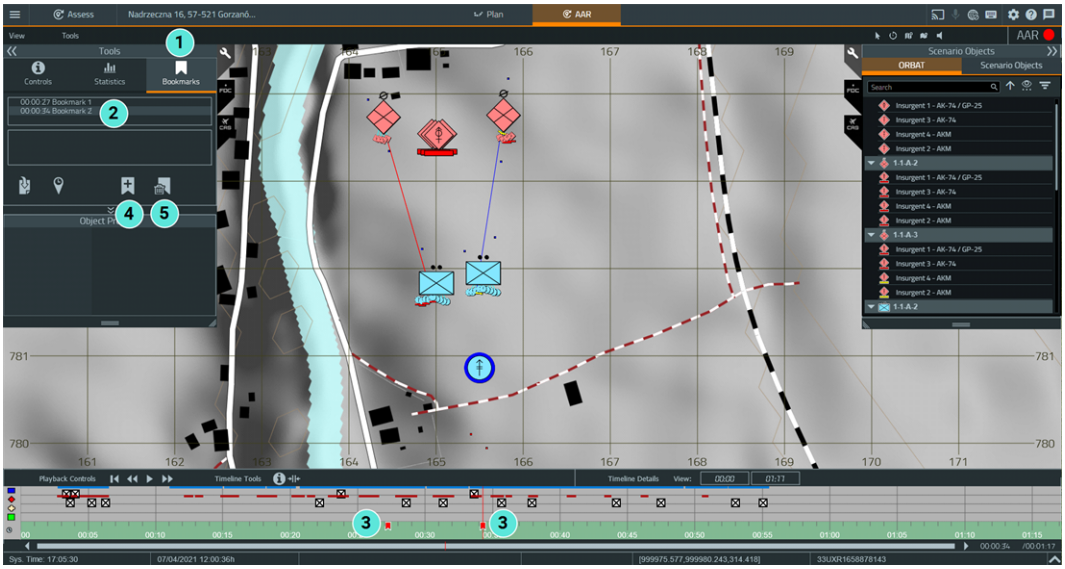
You can tag notable events in a mission during AAR Recording using bookmarks. Bookmarks are added to an AAR using the Tools Panel in Execute or AAR mode.

Follow these steps:

1. Click the **Bookmarks** tab.
2. When a notable event occurs you want to tag, click the **Add Bookmark** icon.

The bookmark is added to the Bookmarks list, and a **red** bookmark icon is added to the timeline.

Image-2: Tools panel and Bookmarks tab



The following bookmark features are available:

1	**Bookmarks Tab**	Click to open the Bookmarks panel.
2	**Bookmarks List**	List of bookmarks, and the time they were created. Click a bookmark to jump to the time the bookmark was added.
3	**Bookmarks**	Bookmarks (**red**) attached to the timeline.
4	**Add Bookmark**	Click this icon to add a bookmark at the current point in time.
5	**Delete Bookmark**	Select a bookmark in the list, and click this icon to delete it. The red bookmark icon is also removed from the timeline.

NOTE

Bookmarks can also be added during playback if desired.

During AAR Playback, access bookmarks in the List Bookmarks Dialog in the VBS4 AAR Manual.

6. Scenario Monitoring

VBS4 provides Instructors with numerous ways to monitor the status of their scenario and its participants during Scenario Execution.

- Use Editor Views and Camera Options to change perspective while the scenario executes.

  For more information, see Instructor Views and Perspectives (on the next page) and Spectator Camera (on page 59).

- Use specific visualizations to monitor the activity of units and vehicles during Scenario Execution:
  - Field of View Visualization (on page 63)
  - Ink-Spot Visualization (on page 65)
  - Laser Target Line Visualization (on page 67)
  - Hit Line Visualization (on page 68)
  - Trail Visualization (on page 69)
- Use the Exercise Monitor to listen to and communicate with players using VBS Radio.

  For more information, see Monitoring VBS Radio (on page 70).

- Use VBS Gateway to monitor the status of entities in a combined DIS / HLA simulation.

  For more information, see Monitoring with VBS Gateway (on page 78).

- Use specific visualizations to view the factors determining the behavior of Control AI units and vehicles in VBS4.

  For more information, see Control AI Visualization (on page 91).

Specific use cases include monitoring functionality, including:

- Monitoring the OPV River Class (on page 124)

For an example of using visualizations in VBS4 to assist training, watch the VBS4 Instructor Series - Land Navigation video at https://youtu.be/joXbKEPnPQA.

NOTE

Videos may not show the latest versions of the features they demonstrate.

6.1 Instructor Views and Perspectives

During Scenario Execution the Instructor can access many different camera views and perspectives of a running scenario.

The primary views during Scenario Execution are the same Editor Interfaces accessed during Scenario Preparation:

2D Map View

- From the Editor Menu, select **View > 2D Map View**.
- Press **Map** (**M**) from any other view.
- From the 3D Camera View, right-click an object and select **Center in Map** to open the 2D Map View with the selected object centered in the map.

3D Camera View

- From the Editor Menu, select **View > 3D Camera View**.
- In the 2D Map, right-click a position on the map and select **Default Camera** to open the 3D Camera View in the selected position.
- To save the camera 3D position and state, including date and time, to the Windows clipboard, press **Ctrl + Alt + S**.

  You can then do one of the following:

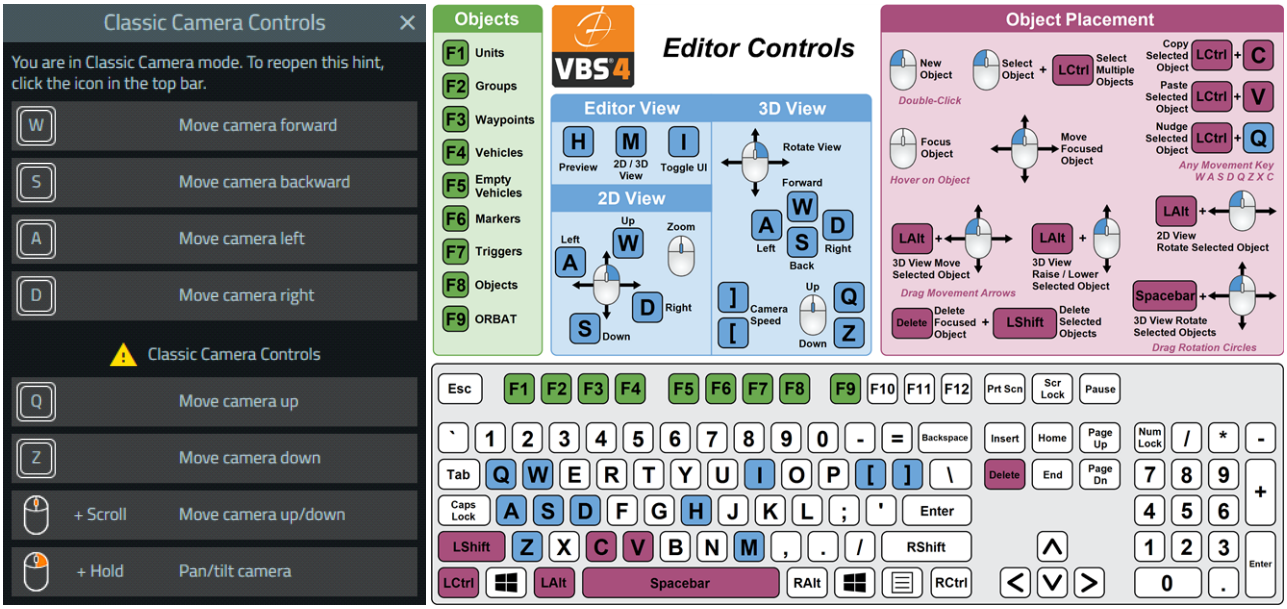
  - To restore the camera 3D position and state, after moving the camera to a different position and / or changing the scenario date / time, press **Ctrl + Alt + L** in VBS4.
  - To save the camera 3D position and state as XML text, press **Ctrl + V** in a text document.

Hide the User Interface

To get an unobstructed view of the Editor 2D Map or 3D Camera View, press **I** to hide the Editor Interface.

> **NOTE**
>
> Some indicators that are drawn directly in the Map or 3D View, such as Hazardous Areas and Plan Drawings are not hidden by this control.

Image-3: 2D Map and 3D Camera View Controls



The Instructor can also access additional views from the 2D Map or 3D Camera Views.

Right-click an object and select from any of the applicable options:

- Default Camera (on the next page)
- Player Camera (on the next page)
- Lock Camera (on the next page)
- Bullet Camera (on page 58)
- Nose Camera (on page 58)
- Gun Camera (on page 58)
- Switch to Crew Optics (on page 58)

> **NOTE**
>
> The available views depend on the object type.
>
> With the exception of the Default and Lock Camera, the observer has no camera control in these views.

In addition, the Spectator Camera is available in Preview and Execute Modes. For more information, see Spectator Camera (on page 59).

6.1.1 Default Camera

Switch to the 3D Camera View in the selected map position.

- Right-click a location in the 2D Map View, and select **Default Camera**.

Use the 2D Map and 3D Camera View Controls (on the previous page) to control the camera.

6.1.2 Player Camera

Switch to the first-person perspective of the selected unit, which may be player or AI-controlled.

- Right-click a unit, and select **Camera Views > Player Camera**.

> **NOTE**
>
> - Zoom level synchronization (for example, while using sniper rifles, binoculars, tank optics) is not instantaneous - it can take a few seconds, during which the zoom level the spectator sees might not correspond to the actual zoom level on the player computer.
> - Synchronization is not fully accurate and the reticule on the spectator computer is noticeably off, especially while aiming at longer distances and using high magnification.

6.1.3 Lock Camera

Switch to a camera view of the selected object, which is centered on the object.

1. Right-click an object, and select **Lock Camera**.
2. Use the following camera controls:

Control	Description	Control Name
A	Rotate left	Move Editor Camera Left
D	Rotate right	Move Editor Camera Right
W	Rotate up	Move Editor Camera Forward
S	Rotate down	Move Editor Camera Back
Q	Zoom in	Raise Editor Camera
Z	Zoom out	Lower Editor Camera

6.1.4 Bullet Camera

Switch to a camera view that follows any projectiles fired by the selected unit or vehicle.

- Right-click a unit or vehicle, and select **Camera Views > Bullet Camera**.

> **NOTE**
> If no projectiles are being fired, the camera acts as a Player Camera (on the previous page).

6.1.5 Nose Camera

Switch to a camera view facing forward from the front of the selected vehicle.

- Right-click a vehicle, and select **Camera Views > Nose Camera**.

6.1.6 Gun Camera

Switch to the optics of the primary weapon of the selected vehicle.

- Right-click a vehicle, and select **Camera Views > Gun Camera**.

6.1.7 Switch to Crew Optics

Switch to the optics view of a crew member in the selected vehicle.

1. Right-click a vehicle and select **Camera Views > Switch to Crew Optics**.
2. In the IWV interface (see Interact with Vehicles Interface (IWV) in the VBS4 Trainee Manual), select the vehicle crew member to use.

> **NOTE**
> If the crew member is not controlling a vehicle weapon, the camera acts as a Player Camera (on the previous page).

6.2 Spectator Camera

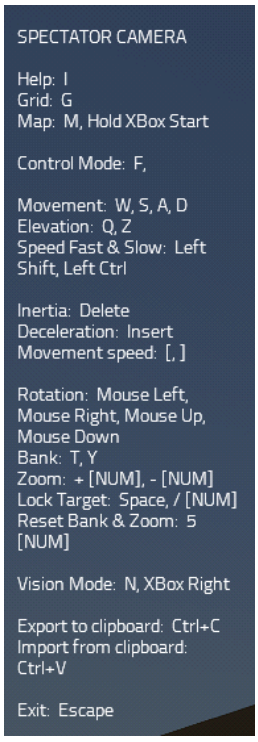
The Spectator Camera allows Instructors to use spectator controls in the scenario Preview and Execute Modes.

Follow these steps:

1. Press **Esc** in the simulation Preview / Execute Mode.
2. Click the **Eye Icon** in the VBS4 Toolbar.

   The Spectator Camera opens, and its controls appear in the Spectator Camera dialog.

3. Use any of the following Spectator Camera controls:

> **NOTE**
>
> To set different Spectator Camera controls, see **Editor Controls** in Controls Settings in the VBS4 Administrator Manual.

Control	Description
Help	Shows / hides the Spectator Camera dialog, which lists the camera controls.
Grid	Shows / hides a grid in the Spectator Camera 3D view.
Map	Shows / hides the 2D map.
Control Mode	Switches between the following camera control modes: • **ORBIT** - Locks the camera orientation. **NOTE** Elevation (below) controls cannot be used with this Control Mode. • **FLY** - Moves to where the camera is oriented. • **SIMULATED** - Free look, as in the player simulation.
Movement	Moves the camera forward / backward / left / right. **TIP** For the **ORBIT** Control Mode (above), you can hold the **RMB** and move the mouse, to move the camera over the terrain.
Elevation	Increases / decreases the camera elevation.
Speed Fast & Slow	Camera speed modifier. When pressed in combination with the Movement Speed (below) / Elevation (above) controls, speeds up / slows down the movement / elevation. To change the basic camera speed, use Movement Speed (below).
Inertia	Camera movement continues inertly for some time, before it stops.
Deceleration	Switches maintaining the camera speed on / off.
Movement Speed	Increases / decreases the basic camera movement speed (which can be also increased / decreased further, using the Speed Fast & Slow (above) modifier). Can also be set in the Input Devices Settings (see Input Devices Settings in the VBS4 Administrator Manual).

Control	Description
Rotation	Rotates the camera. **NOTE** Only applies when Control Mode (on the previous page) is set to **FLY** or **SIMULATED**.
Bank	Roll the camera left / right.
Zoom	Zooms the camera in / out.
Lock Target	Locks the camera to point at a given position, while moving. **NOTE** Only applies when Control Mode (on the previous page) is set to **SIMULATED**. **TIP** To rotate the camera, you can hold the **RMB** and move the mouse.
Reset Bank & Zoom	Reset to default bank and zoom.
Vision Mode	Switches between the following camera vision modes: • **NIGHTVISION** - Night-vision mode. • **THERMAL** - Thermal-imaging mode. • **NVGTI** - Night-vision and thermal-imaging modes. • **VISIBLE** - Normal-vision mode (default).

Control	Description
Export to Clipboard	Exports the camera position and orientation data to the clipboard. The data is exported as text, in the format: `[[latitude, longitude, altitude], [dirX, dirY, dirZ], [upX, upY, upZ]]` • `[latitude, longitude, altitude]` - Camera longitude, latitude, and altitude. • `[dirX, dirY, dirZ]` - Camera direction 3D vector. • `[upX, upY, upZ]` - Camera bank 3D vector (perpendicular to `[dirX, dirY, dirZ]`). **TIP** You can use Import from Clipboard (below) to instantly switch the camera to the exported position and orientation.
Import from Clipboard	Imports camera coordinates and orientation data from the clipboard. **TIP** You can copy the camera position and orientation text from Export to Clipboard (above), and paste it in the Spectator Camera view, which instantly switches the camera view to the pasted (imported) camera position and orientation.
Exit	Exits the Spectator Camera.

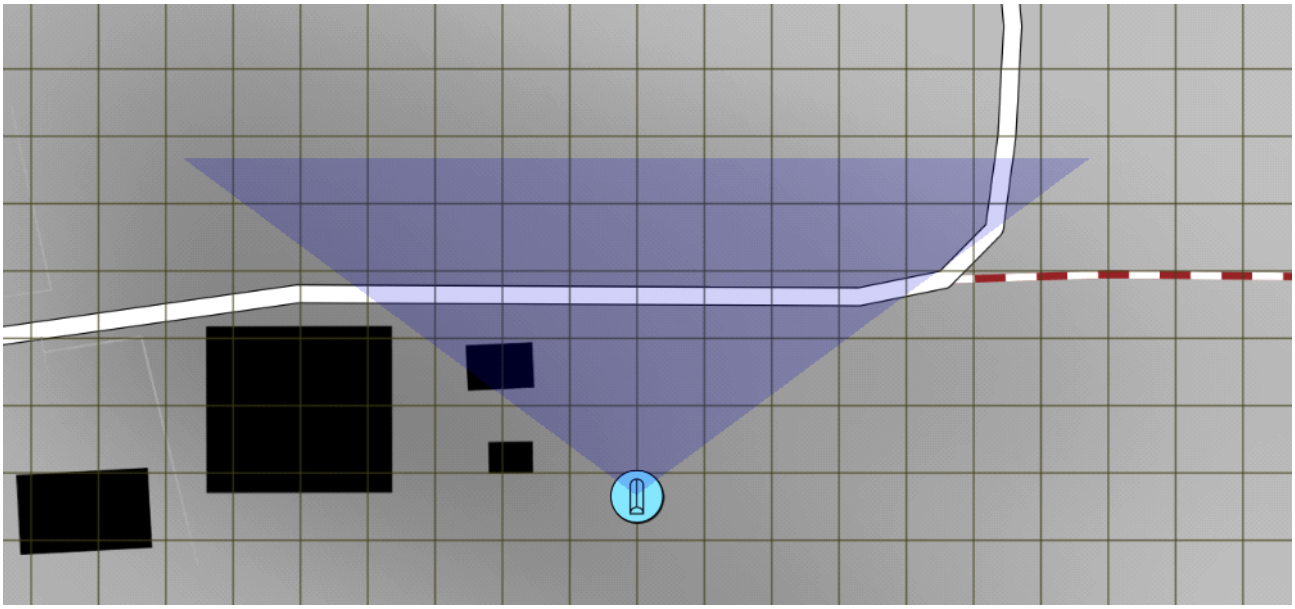
6.3 Field of View Visualization

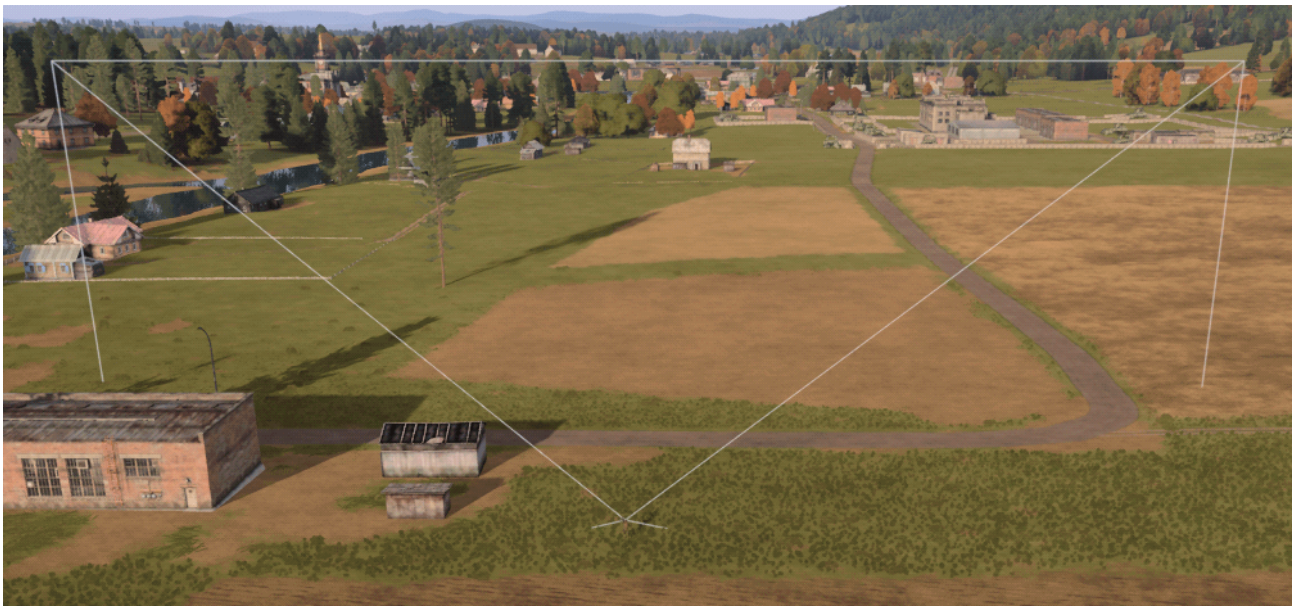
During Scenario Execution, the Instructor can visualize the Field of View (FOV) for individual units and vehicle crew using VBS Editor in Execute Mode.

Follow these steps:

- In the 2D Map or 3D Camera View, right-click the unit or vehicle and select the applicable option:
  - **Visualizations > Show Unit's FOV**
  - **Visualizations > Show Crew's FOV**

VBS Editor displays the selected Field of View in the 2D Map and 3D Camera Views.



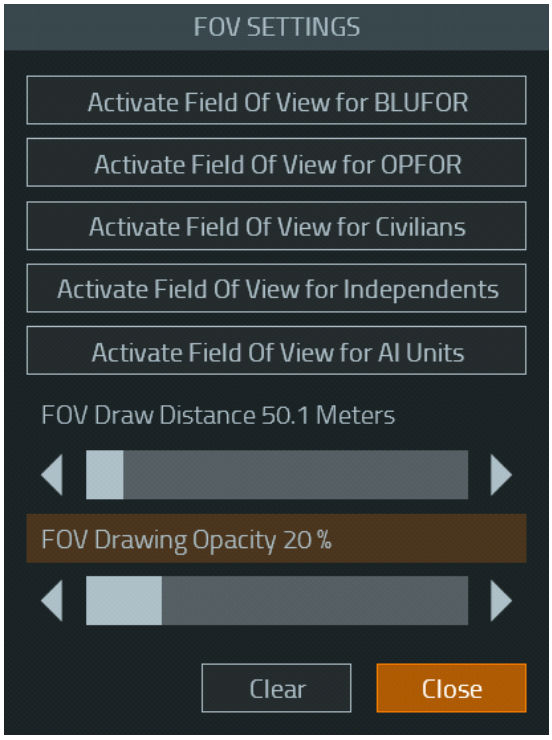


The Instructor can also control the Field of View visualization for whole sides, and customize its appearance.

Follow these steps:

1. In the Editor Menu, select **View > FOV Settings**.

   The FOV Settings panel opens.



2. Control the FOV visualization for whole sides using the applicable **Activate / Deactivate Field of View** buttons.
3. Control the FOV visualization for AI Units using the **Activate / Deactivate Field of View for AI Units** button.
4. Control the length of the FOV cones using the **FOV Draw Distance** slider.
5. Control the transparency of the FOV cones using the **FOV Drawing Opacity** slider.
6. Click **Clear Unit / Vehicle Settings** to reset the FOV settings applied to individual units or vehicles.

6.4 Ink-Spot Visualization

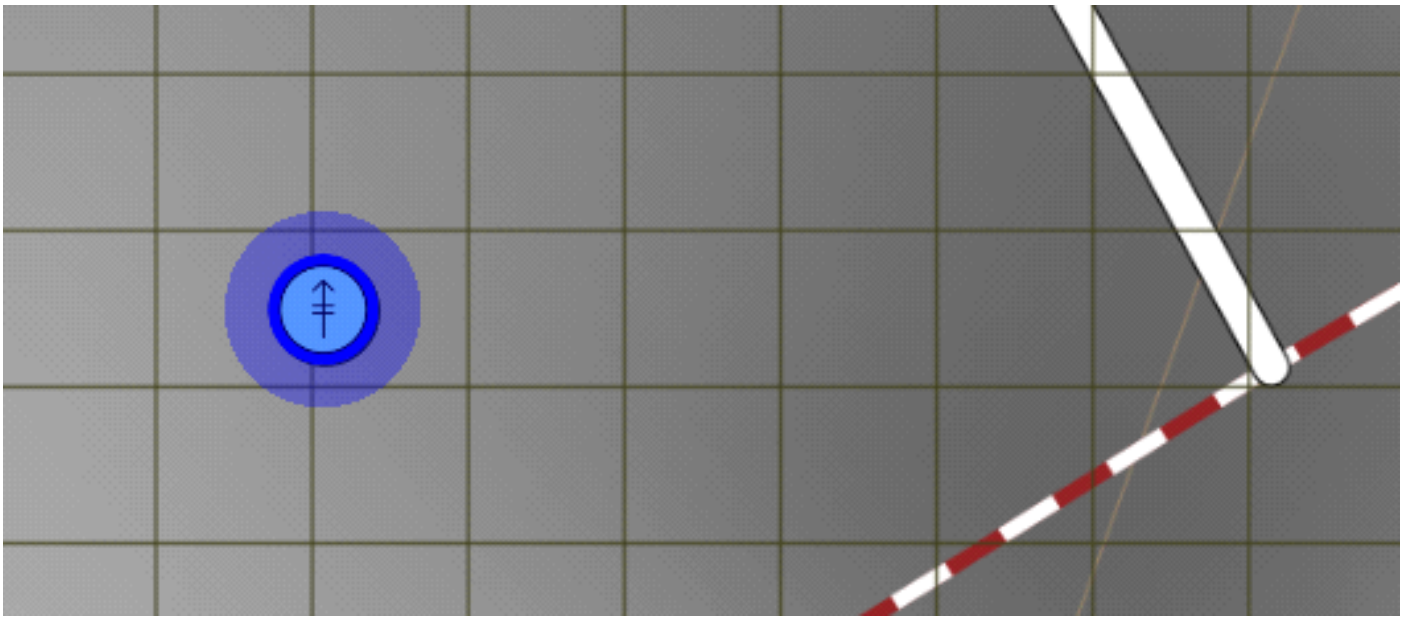
During scenario execution, Instructors can visualize a lack of activity by units or vehicles / static vehicles by using Ink-Spots in the VBS Editor in Execute Mode. When a unit or vehicle stops moving, an Ink-Spot starts to grow under the unit or vehicle up to a maximum size.

Follow these steps:

In the 2D Map or 3D Camera View, right-click a unit / vehicle and select:

- **Visualizations > Show Unit's Ink-Spot**
- **Visualizations > Show Vehicle's Ink-Spot**

VBS Editor displays the Ink-Spot for the selected unit / vehicle in the 2D Map and 3D Camera Views.

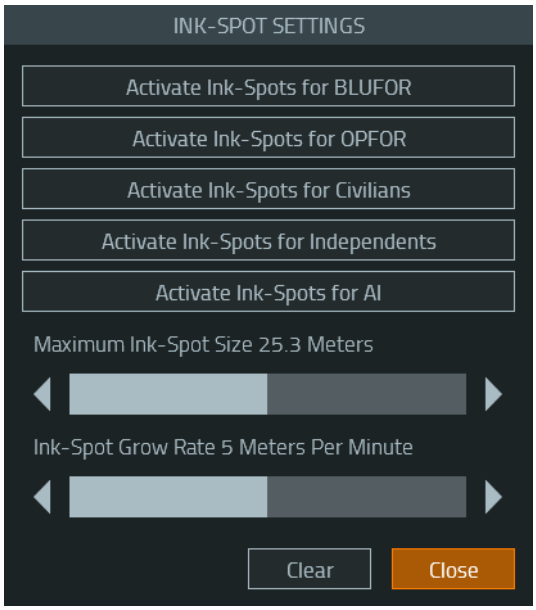


The Instructor can also control the Ink-Spot visualization for whole sides, and customize its appearance.

Follow these steps:

1. In the Editor Menu, select **View > Ink-Spot Settings**.

   The Ink-Spot Settings dialog opens.



2. Control the Ink-Spot visualization for whole sides using the **Activate / Deactivate Ink-Spots for BLUFOR / OPFOR / Civilians / Independents** buttons.

   > **NOTE**
   > Affects units and vehicles.

3. Control the Ink-Spot visualization for AI using the **Activate / Deactivate Ink-Spots for AI** button.

   > **NOTE**
   > Affects units and vehicles.

4. Control the maximum radius of the Ink-Spot using the **Maximum Ink-Spot Size** slider.
5. Control the rate of growth of the Ink-Spot using the **Ink-Spot Grow Rate** slider.
6. Click **Clear** to reset the Ink-Spot settings applied to individual units / vehicles.
7. Click **Close** to close the dialog.

The Ink-Spot color is configurable in the `VBS4.xml` file using the `StationaryDefaultColor[] = {r,g,b,a};` parameter with each color component in a 0 to 1 range.

```
StationaryDefaultColor[] = {0.000000,0.000000,1.000000,0.700000};
```

For more information, see VBS4.xml Options in the VBS4 Administrator Manual.

6.5 Laser Target Line Visualization

During Scenario Execution, the Instructor can visualize laser designation targeting using VBS Editor in Execute Mode.

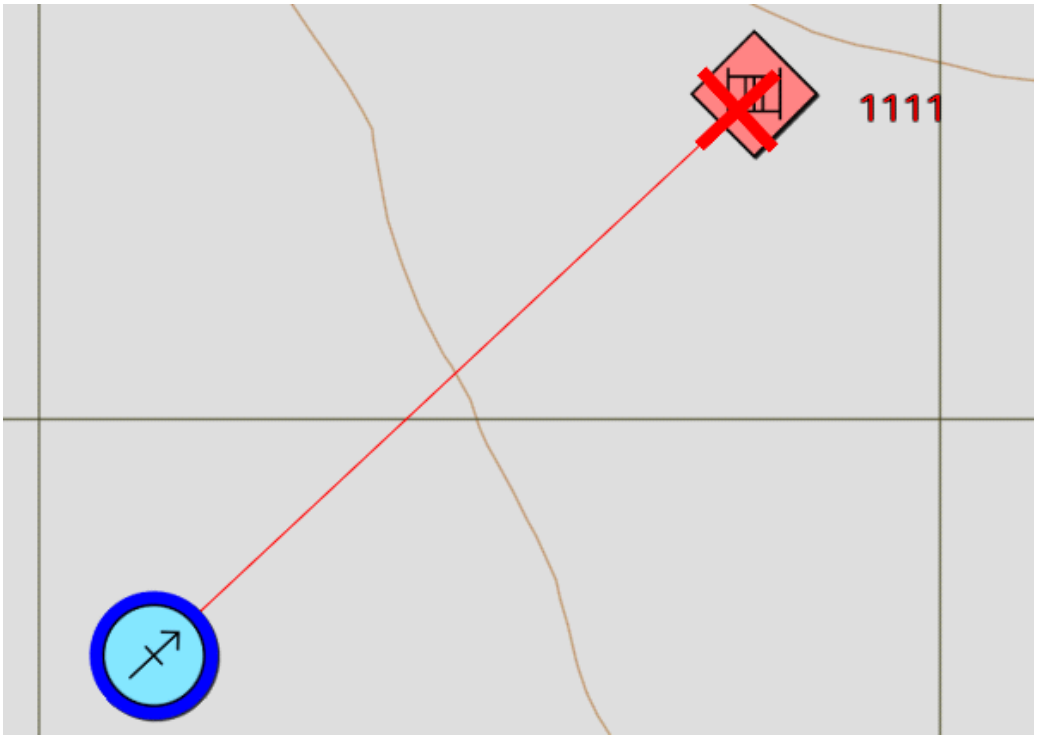
> **NOTE**
>
> The following considerations apply:
>
> - **Shown** - Visible laser lines in the 2D View, PRF (Pulse Repetition Frequency) code in the 2D View, target markers in the 2D and 3D Views.
> - **Hidden** - Visible target markers in the 2D View.

Follow these steps:

- In the Editor Menu, select **View > Show Laser Target Lines**.

VBS Editor displays laser target lines and PRF codes in the 2D Map View based on their use in the Scenario.

To use Laser Designators during Scenario Execution, see Laser Designator in the VBS4 Trainee Manual.



6.6 Hit Line Visualization

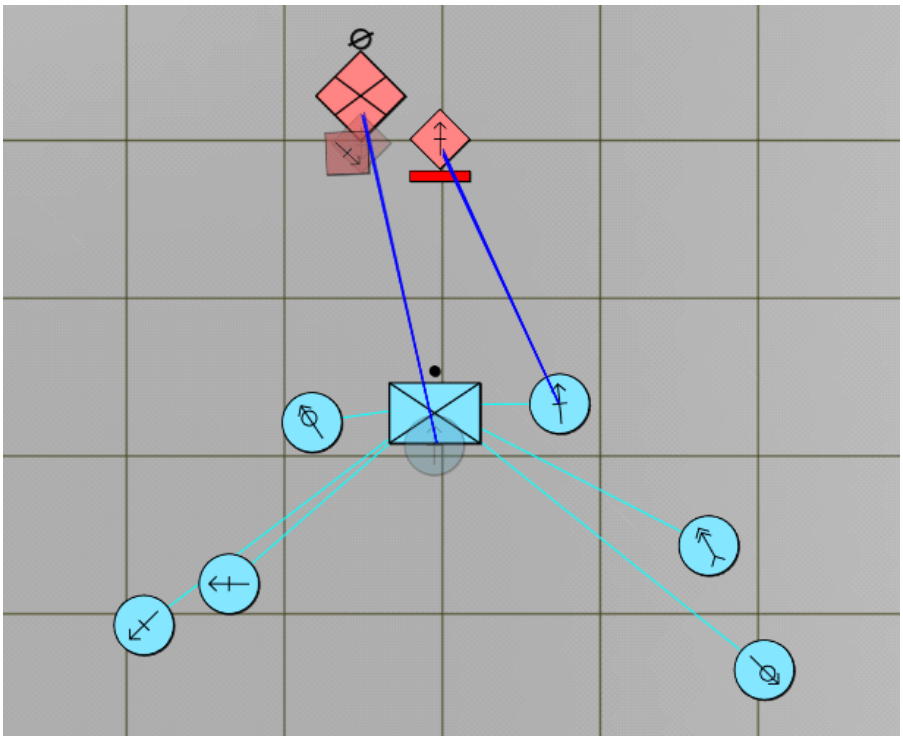
During Scenario Execution, the Instructor can visualize weapons fire for individual units and vehicle weapons using VBS Editor in Execute Mode.

Follow these steps:

- In the Editor Menu, select **View > Show Hit Lines**.

VBS Editor displays weapons fire from units and vehicles in the 2D Map View.

Image-4: Visualized hit lines between BLUFOR and OPFOR groups



6.7 Trail Visualization

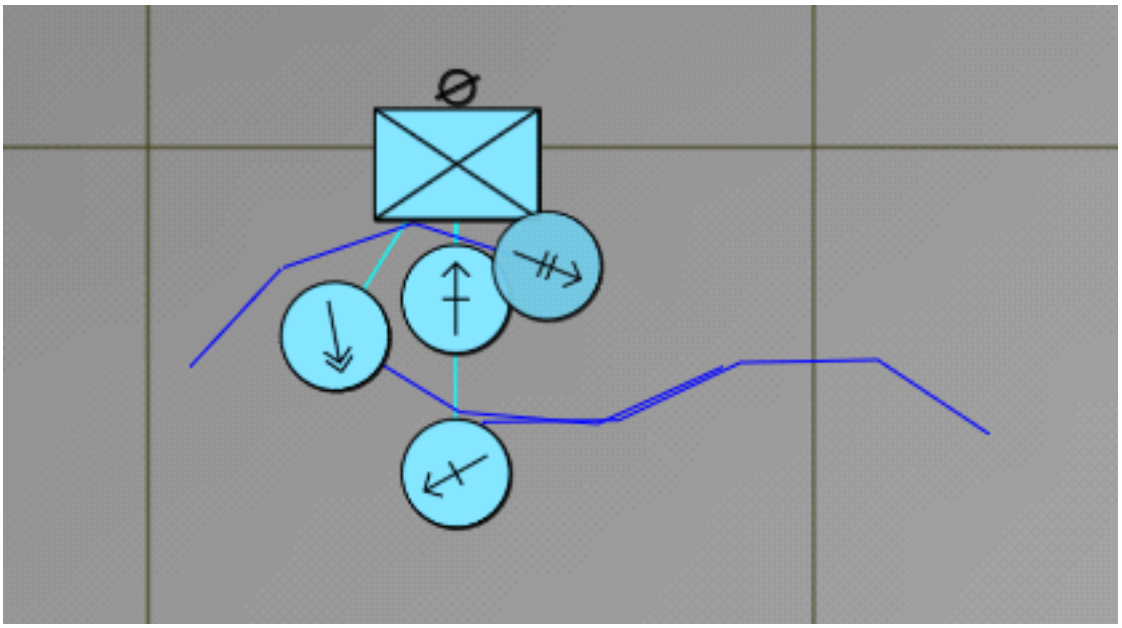
During Scenario Execution, the Instructor can visualize the recent paths that units and vehicles have followed using VBS Editor in Execute Mode.

Follow these steps:

- In the 2D Map or 3D Camera View, right-click a unit and select **Visualizations > Toggle Trails On / Off**.

> **NOTE**
> The setting for a Group Leader also toggles the Trails for members of the group.

VBS Editor displays the path followed by the selected unit over the last minute or so as a solid blue line in the 2D Map and 3D Camera Views.



The Instructor can also control the Trail visualization for all units and vehicles with a single setting.

Follow these steps:

- In the Editor Menu, select **View > Show / Hide Trails**.

6.8 Monitoring VBS Radio

In VBS Editor, Instructors are able to listen to and transmit on any channel using the Communications panel, as well as see transmission visualizations in the 2D and 3D Views.

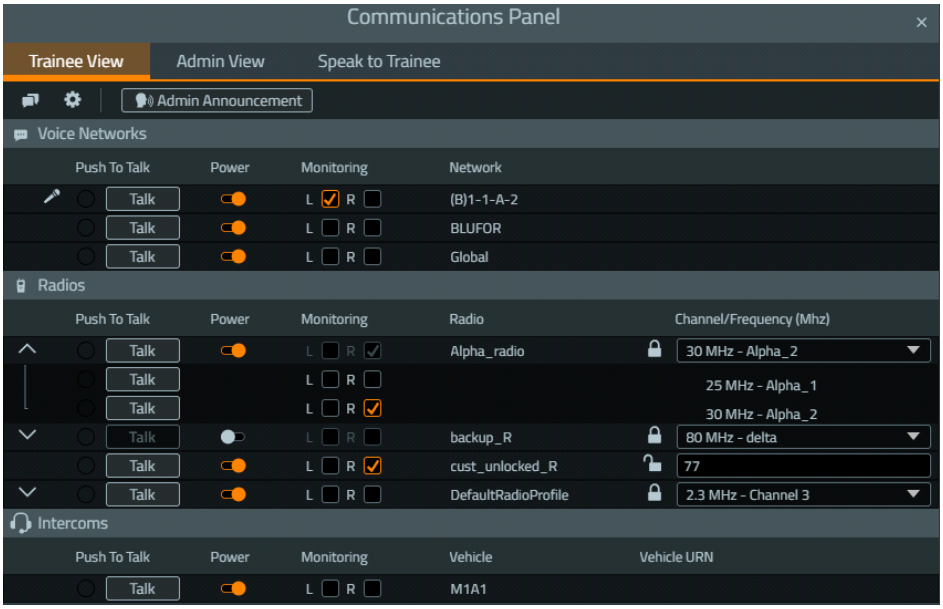
- Communications Panel (below)
- Transmission Visualization (on page 77)

6.8.1 Communications Panel

Use the Communications panel to listen to and transmit on any channel.

In the Editor Toolbar, click the **radio** icon to access the Communications panel.

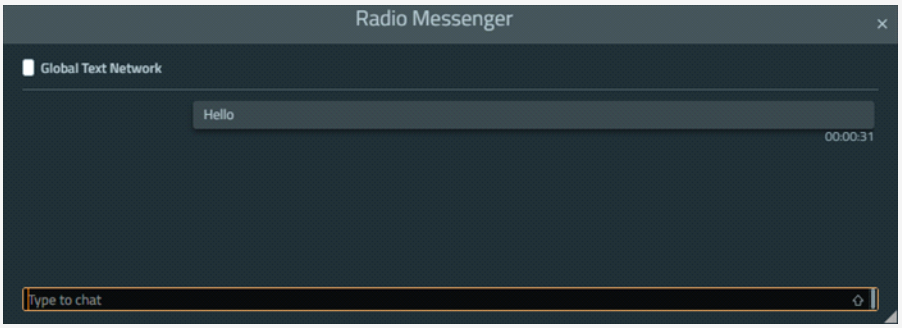
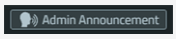
As an Administrator / Instructor, you can access the **Trainee View**, **Admin View**, and **Speak to Trainee** tabs.



TIP

Click a **down arrow** to show more properties for a specific radio.

The settings combine physical communication device control and related settings.

Section	Setting	Description
Radio Messenger		Click the **Text** icon to open the Radio Messenger dialog, and use the Global Text Network. Enter your message in the **Type to chat** field, and click the **up arrow** / press **Enter** to send. 
Radio Settings		Click the **Settings** icon to adjust radio settings (see Radio Settings (on page 73)).
Admin Announcement		Click and hold the **Admin Announcement** button to broadcast to all units in the scenario at the same time. Admin Announcement has the following features: • Broadcasts are heard by all users (including other Administrators), regardless of their current radio / channel setup. • It is listed under VoIP channels (there is no degradation). • Only Administrators can speak on this channel. • It cannot be disabled or monitored, using the **L** / **R** options. • It works with VBS Radio Standalone, and is recorded in the AAR. • It is not available in the Prepare Mode **Radio Admin** options.
Voice Networks Control individual Communication Channels.	**Push to Talk**	Click **Talk** to broadcast. The Radio HUD indicator shows circular radio waves (see Radio HUD and Controls).
	Power	In the Trainee View tab only. Click to turn the power of the Communications Channel on / off.
	Monitoring	Select to monitor the **L** (left) or **R** (right) ear output (see Create Radio Channels in the VBS Radio Manual).
	Network	Displays the Communication Channels.

Section	Setting	Description
Radios Control Radio Types and Radio Channels.	**Push to Talk**	Click **Talk** to broadcast. The Radio HUD indicator shows circular radio waves (see Radio HUD and Controls).
	Power	In the Trainee View tab only. Click to turn the power of the Communications Channel on / off.
	Monitoring	Select to monitor the **L** (left) or **R** (right) ear output (see Create Radio Channels in the VBS Radio Manual).
	Radio	Displays the Radio Type being used.
	Channels / Frequency	Use the drop-downs to change the channel / frequency for each device.
Intercoms Control individual intercoms.	**Push to Talk**	Click **Talk** to broadcast. The Radio HUD indicator shows circular radio waves (see Radio HUD and Controls).
	Power	In the Trainee View tab only. Click to turn the power of the Communications Channel on / off.
	Monitoring	Select to monitor the **L** (left) or **R** (right) ear output (see Create Radio Channels in the VBS Radio Manual).
	Vehicle	Vehicle configuration name (also shown on the Radio HUD, see Radio HUD and Controls).
	Vehicle URN	Vehicle Unit Recognition Number (URN) (also shown on the Radio HUD, see Radio HUD and Controls). **NOTE** If used, the URN is displayed as the Intercom name. If not used, the vehicle configuration name is displayed as the Intercom name.

6.8.1.1 Radio Settings

Click the **settings** icon to adjust radio settings.

Setting	Description
Input	Use the slider to adjust. Changes the volume of outgoing radio communication (corresponds with microphone sensitivity).
Output	Use the slider to adjust. Changes the volume of incoming radio communication (corresponds with speaker volume).
VOX Threshold	Use the slider to adjust. Changes the microphone threshold value for VOX. **NOTE** If the microphone input is below the VOX threshold, it is visualized by a dark **gray** area on the VBS Radio HUD volume bar.  If the selected channel uses VOX and the microphone input is above the **VOX Threshold**, then the **gray** icon shows circular radio waves around it. Also, if Direct Talk Mode uses VOX, and the microphone input is above the **VOX Threshold**, then the Direct Talk indicator light is **green**. 
Independent Left / Right Mode	Click the button to enable / disable. If enabled, the Primary Ear radio buttons are made available. The active channel is monitored in the selected ear (Left / Right). All other channels are monitored in the other ear.
Show HUD	Click the button to show / hide the in-game HUD, see Radio HUD and Controls in the VBS Radio Manual.

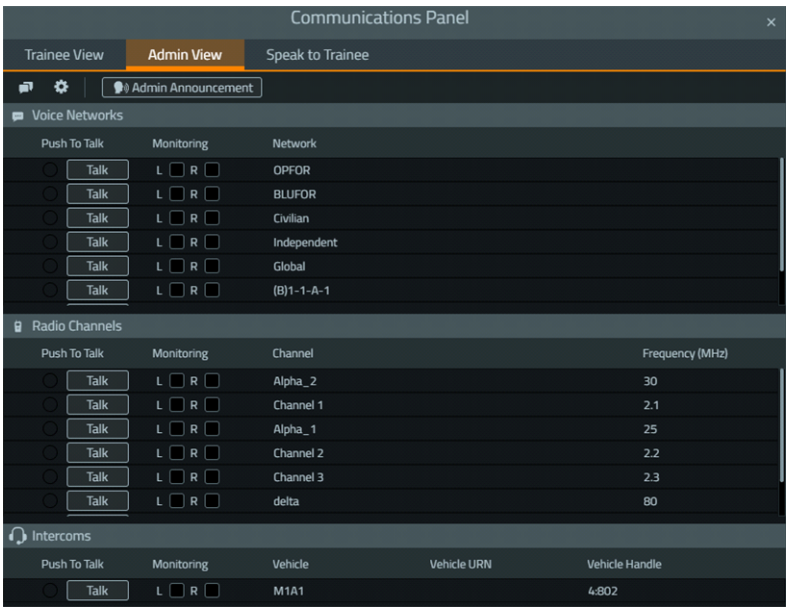
Setting	Description
Show Incoming Traffic	If enabled, shows a visual indicator of which channel / radio is being received in the HUD. This setting can be enabled / disabled during a mission. 
Show Incoming Traffic Units	If enabled, shows the name of the Player whose transmission you are receiving. This setting can be enabled / disabled during a mission.  **WARNING** This setting does not work unless **Show Incoming Traffic** is enabled.

NOTE

The default values of the **Show HUD**, **Show Incoming Traffic**, and **Show Incoming Traffic Units** settings, which determine if the buttons are functional or not, can be changed in the `VBSRadioSettings.xml` file. For more information, see VBSRadioSettings Configuration File in the VBS Radio Manual.

6.8.1.2 Admin View

Click the **Admin View** tab, and adjust the following settings.

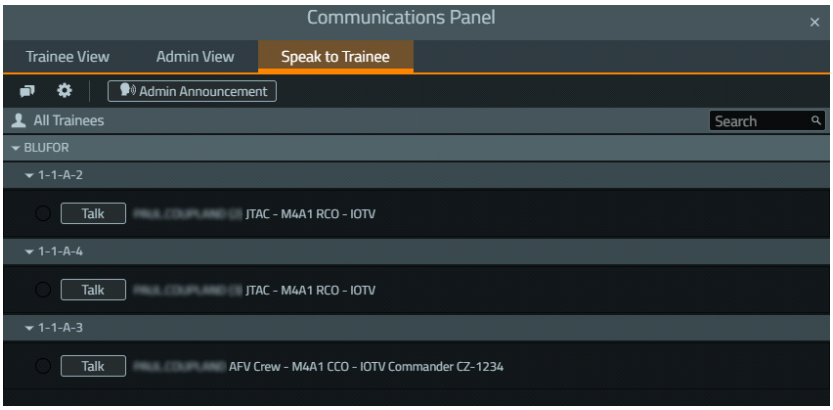


Settings	Description
Voice Networks	Control the Voice Networks: • **Push to Talk** - Click the **Talk** button to broadcast. The indicator light illuminates (**green**). If you are using a half-duplex radio profile, the indicator turns **red** if you are blocked by another user who is broadcasting. The Radio HUD indicator shows circular radio waves (see Radio HUD and Controls in the VBS Radio Manual). • **Monitoring** - Select to monitor the **L** (Left) / **R** (Right) ear output (see Create Radio Channels in the VBS Radio Manual). • **Network** - Displays the Communication Channels.
Radio Channels	Control the Radio Channels: • **Push to Talk** - Click the **Talk** button to broadcast. The indicator light illuminates (**green**). If you are using a half-duplex radio profile, the indicator turns red if you are blocked by another user who is broadcasting. The Radio HUD indicator shows circular radio waves (see Radio HUD and Controls in the VBS Radio Manual). • **Monitoring** - Select to monitor the **L** (Left) or **R** (Right) ear output (see Create Radio Channels in the VBS Radio Manual). • **Channel** - Displays the channel names. • **Frequency (MHz)** - Displays the set frequencies for each radio channel.

Settings	Description
Intercoms	• **Push to Talk** - Click the **Talk** button to broadcast. The indicator light illuminates (**green**). • **Monitoring** - Select to monitor the **L** (Left) or **R** (Right) ear output (see Create Radio Channels in the VBS Radio Manual). • **Vehicle** - Vehicle configuration name. • **Vehicle URN** - Vehicle Unit Recognition Number (URN). • **Vehicle Handle** - VBS reference for entities. **TIP** Hover your cursor over a vehicle in the **Vehicle**, **Vehicle URN**, or **Vehicle Handle** columns to see a list of the vehicle occupants.

6.8.1.3 Speak to Trainee

Click the **Speak to Trainee** tab to open the All Trainees list, and speak directly to a specific Trainee.



Column	Description
Push to Talk	Click the **Talk** button next to a specific player to speak to them directly. The indicator light shows **green**. If you are using a half-duplex radio profile, the indicator light shows **red** if you are blocked by another user who is broadcasting.
All Trainees	Lists the names of the players in the scenario.

6.8.2 Transmission Visualization

Transmissions are visualized in 2D and 3D Views in Execute Mode. The following icons appear next to the transmitting unit in the 2D View, and above them in the 3D View, depending on the transmission type:

> **NOTE**
>
> The icons are only visible to Administrators / Instructors.

Icon	Description
	Simulated Radio / Additional audio channels (Pitch Voice)
	Intercom
	Direct Talk

6.9 Monitoring with VBS Gateway

VBS4 includes VBS Gateway to support interoperable simulation with DIS / HLA compliant products for distributed training use cases.

During Scenario Execution, the Instructor can monitor the externally controlled entities in the Editor 2D Map and with the VBS Gateway UI:

- External Simulation Entities in VBS4 (below)
- Simulation Monitoring (on the next page)
- Communications Monitoring (on page 89)

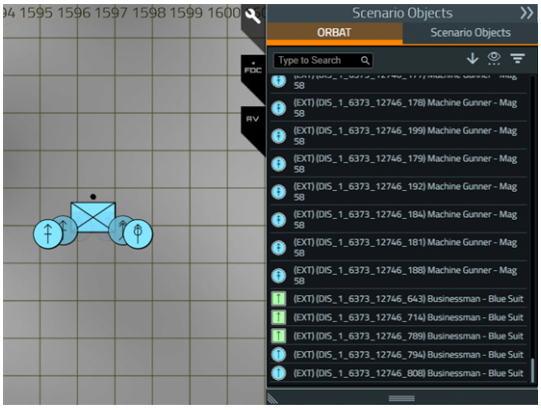
6.9.1 External Simulation Entities in VBS4

When VBS4 operates as part of a combined simulation, there are additional entities present in VBS4 that are controlled by the other simulation products.

To highlight these external entities in the RTE, their appearance is different:

- In the 2D view, interoperable entities use a lighter color than the equivalent VBS4 entity.
- In the Object Tree, their names contain an **(EXT)** prefix.

> **NOTE**
>
> VBS4 controlled units cannot enter externally controlled vehicles.

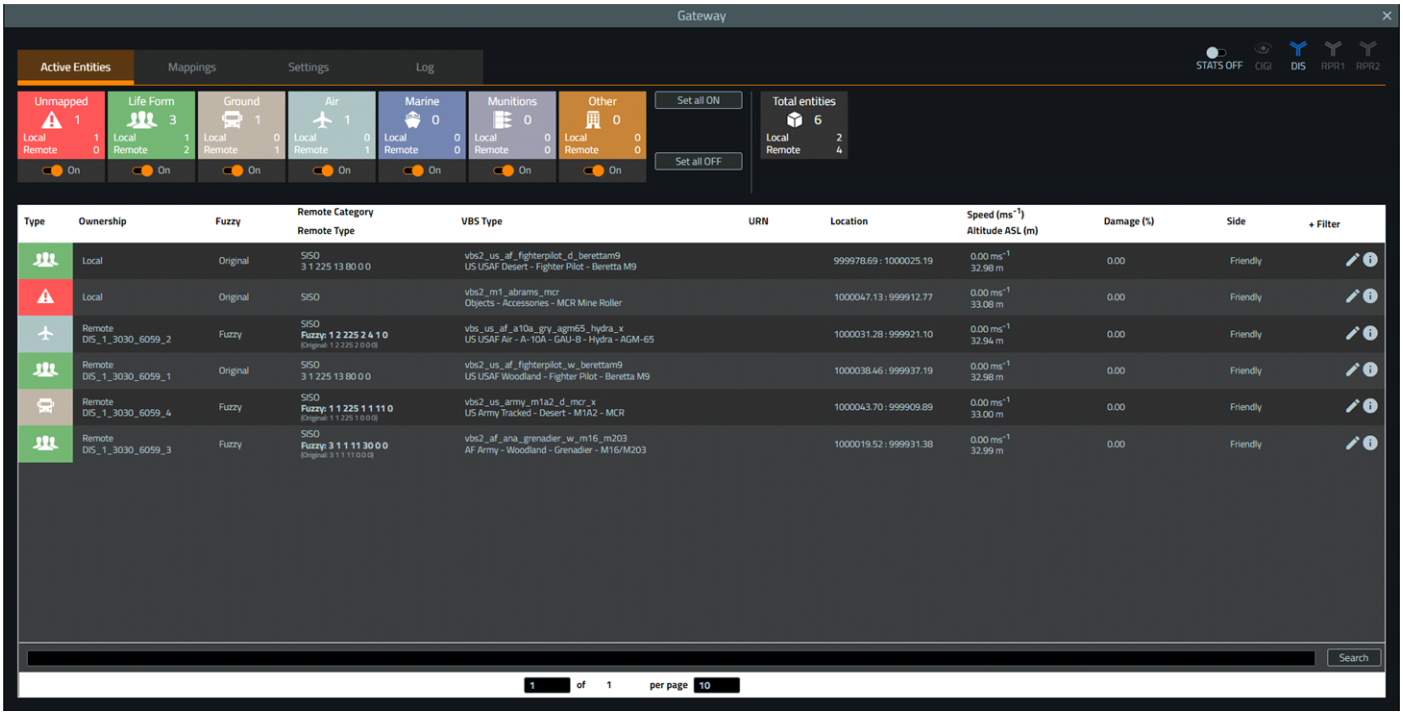


6.9.2 Simulation Monitoring

Simulation Administrators use the Active Entities page (see Active Entities Page in the VBS Gateway Manual) to monitor the entities in the current network scenario.

Unlike the Active Entities Page, the Mappings Page (see the VBS Gateway Manual) allows you to update entity mappings for entities that have a short lifespan in the simulation (such as munitions), since they get logged and remain visible on the Mappings Page, even after they physically disappear from the simulation.

For information on how to edit and fix mappings using the Active Entities Page or the Mappings Page, see Edit an Entity Mapping (on page 82), Detect and Fix Unmapped VBS Entities (on page 84), and Detect and Fix Remote Entities (on page 86).

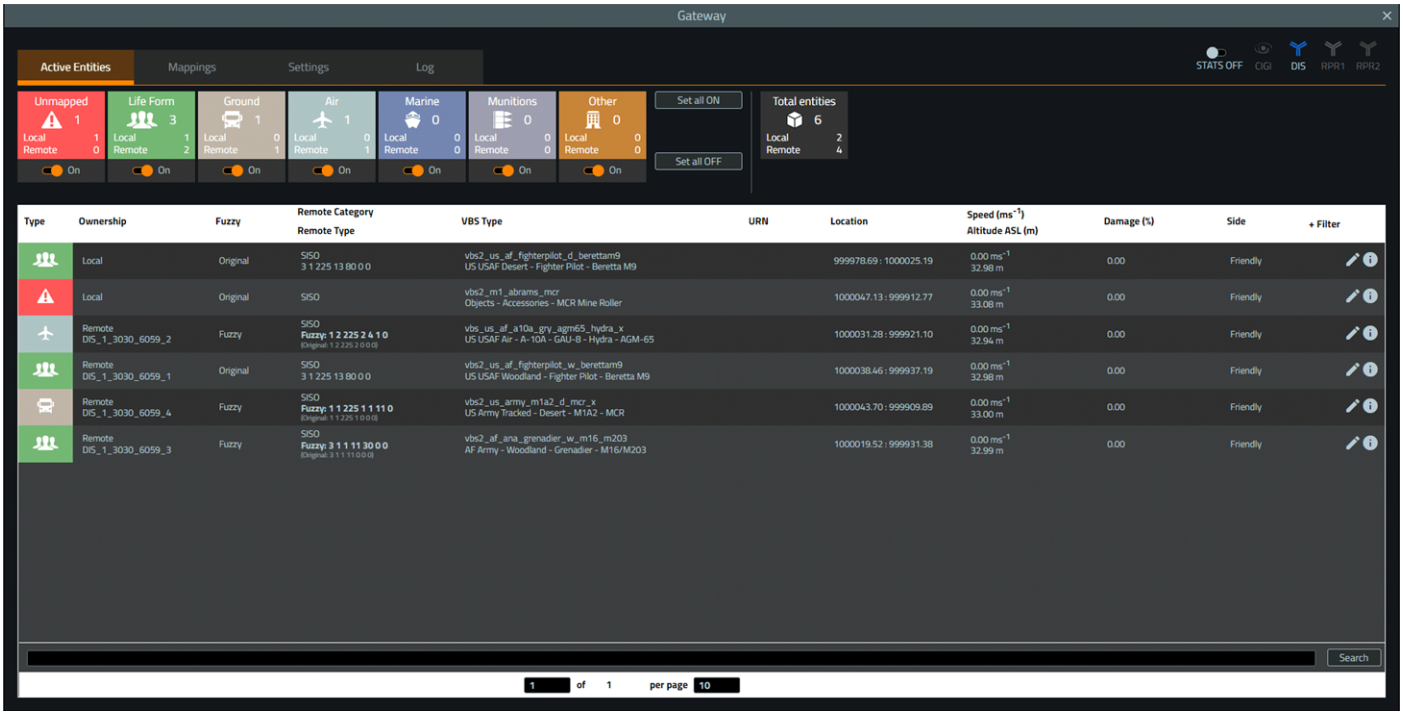


VBS Gateway displays all currently active entities on this page in one of seven categories:

- **Unmapped** - Entities of any type that are currently unmapped.
- **Life Form** - Any human or animal entities.
- **Ground** - All ground vehicles.
- **Air** - All aircraft.
- **Marine** - All watercraft.
- **Munitions** - All munitions.
- **Other** - Any entities, such as cultural features, that do not fit the other categories.

Use the following features to sort, filter, and find entities in the Active Entities page:

- Use the **Search** bar to find specific entities or types of entities.
- Use the Entity Category **ON / OFF** buttons to filter which entity categories are displayed. These categories also indicate how many entities of that type are currently active.
- The default number of entities shown per page is 10. Use the **per page** dialog box at the bottom of the page to change the number of entities displayed.



Information is displayed in the following columns on the Active Entities page.

All entity-information columns enable either alphabetic or numeric sorting by clicking column heading.

Click **+ Filter** to display column filters.

All entity-information columns use filters that vary according to the type of content:

- Category columns such as **Type**, **Ownership**, **Fuzzy**, and **Side** use category selection filters.
- String columns such as **VBS Type** and **Remote Category / Remote Type** use dynamic search input filters.
- Numeric columns such as **Location** and **Speed** use Min and Max input filters.

Column	Description
Type	Entity type. Can be: • No Filter (no entity type filter is applied) • Unmapped • Life Form • Ground • Air • Marine • Munitions • Other
Ownership	Entity ownership. Indicates if the entity is local or remote. Also, shows the script reference name for the entity, if one exists. The script reference name can be used to identify the entity for script calls. For remote entities, script reference names are automatically generated based on the adapter and source application. **EXAMPLE** DIS_1_152_303_17. The script reference name for local and remote entities can be edited from the Entity Details dialog (see Entity Details Dialog in the VBS Gateway Manual) and in Execute mode for local entities. Can be: • No Filter (no entity-ownership filter applied) • Local (the entity is local and managed by the local VBS4 instance) • Remote (the entity is remote and managed by either a remote VBS4 instance or another simulation product)
Fuzzy	Shows **Original** for original mappings, and **Fuzzy** for fuzzy / closest match ones (for more information, see Fuzzy Mapping in the VBS4 Editor Manual). Can be: • No Filter (no mapping filter is applied) • Fuzzy (fuzzy mapping is applied) • Original (exact mapping is applied)
Remote Category / Type	Specifies the standard and enumeration for this entity. Fuzzy mappings (see Fuzzy Mapping in the VBS4 Editor Manual) appear in bold.
VBS Type	VBS class name of the entity.
URN	Marking set for this entity. This is displayed on the side vehicles, in the editor, and on remote servers. This field is blank if no URN has been set for an entity.
Location	Current map coordinates of the entity. The units used are internal to VBS4.
Speed / Altitude	The first number indicates current speed of the entity in meters per second. The second number indicates the current altitude in meters.
Damage	Percentage of maximum damage the entity has taken.

Column	Description
Side	Side the entity belongs to. Can be: • No Filter (no side filter is applied) • Opposing (OPFOR side only) • Friendly (BLUFOR side only) • Neutral (neutral side only) • Other (any other side)

Click the Details icon on any row to open the Entity Details dialog (see Entity Details Dialog in the VBS Gateway Manual) to see more detailed information about that entity.

Click the Edit icon on any row to open the Mapping Dialog to view and edit the mappings.

During a scenario, the following situations may require attention:

- An entity has an incorrect Entity Class or an incorrect VBS Class.

  See Edit an Entity Mapping in the VBS Gateway Manual to correct this error.

- An active VBS4 entity is not mapped.

  See Detect and Fix Unmapped VBS Entities in the VBS Gateway Manual to correct this error.

- An active remote entity is not mapped.

  See Detect and Fix Remote Entities in the VBS Gateway Manual to correct this error.

- The appearance and performance of incoming entities in VBS4 or of outgoing entities in the remote simulation is incorrect.

  See Modify the Simulation Settings in the VBS Gateway Manual to correct this error.

6.9.2.1 Edit an Entity Mapping

To change the mapping between an Entity Class and a VBS4 model, edit the entity mapping.

Follow these steps:

1. Open the Active Entities page or the Mappings page (see Active Entities Page or Mappings Page in the VBS Gateway Manual) and use the Category Filters, Search, or Column Filters to locate the mapping.

2. Select the row to edit, and click the **Edit** icon.

   The Mapping dialog opens.

3. To change the **VBS Type** to map:
   a. Click **Change VBS Model**.

      The Select VBS Model page opens.

   b. Use the **Search** input and click **OK** to filter the list.
   c. Select a model from the list and click **OK**.

   VBS Gateway updates the VBS Type section of the Mapping dialog.

4. To change the **Incoming** mappings:
   a. To remove an incoming mapping, click the Trash Icon for the mapping to delete, and confirm.

   b. To add an incoming mapping, in the **Incoming** section, click **Add Remote Mapping**.

      The Add Remote Mapping dialog opens.

   c. Do one of the following:
      - Type the entity class enumeration in the input.
      - Use the enumeration drop-downs for each enumeration category.

   d. Click **Add**.

   VBS Gateway updates the Incoming section of the Mapping dialog.

> **NOTE**
> VBS Gateway allows multiple incoming mappings to the same VBS model.

5. To add an **Outgoing** mapping:
   a. To remove the existing mapping, click the Trash Icon for the outgoing mapping, and confirm.

   b. To add a new outgoing mapping, in the **Outgoing** section, click **Add Remote Mapping**.

      The Add Remote Mapping dialog opens.

   c. Do one of the following:
      - Type the entity class enumeration in the input.
      - Use the enumeration drop-downs for each enumeration category.

   d. Click **Add**.

   VBS Gateway updates the Outgoing section of the Mapping dialog.

   > **NOTE**
   > VBS Gateway allows one outgoing mapping for each VBS model. Multiple models may use the same outgoing mapping.

6. Close the Mapping dialog.

   VBS Gateway adds the entity mapping to the incoming and outgoing mapping tables.

6.9.2.2 Detect and Fix Unmapped VBS Entities

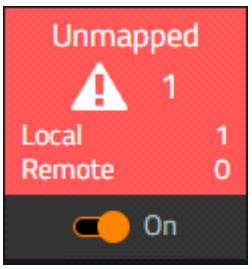
A VBS4 model may not have an outgoing mapping to broadcast to external simulations.

You can fix these outgoing mappings either using the Active Entities page or the Mappings page (see Active Entities Page or Mappings Page in the VBS Gateway Manual).

- Using the Active Entities Page (on the next page)
- Using the Mappings Page (on page 86)

6.9.2.2.1 Using the Active Entities Page

Use the Unmapped Category button on the Active Entities page.



To assign missing Entity Classes to VBS4 models, detect and fix unmapped entities.

Follow these steps:

1. Open the Active Entities page (see Active Entities Page in the VBS Gateway Manual) and use the filters to display only Unmapped entities.
2. Select an unmapped Local Ownership row, and click the **Edit** icon.

   The Mapping dialog opens.
3. To edit the outgoing Entity Class:
   a. In the **Outgoing** section, click **Add Remote Mapping**.

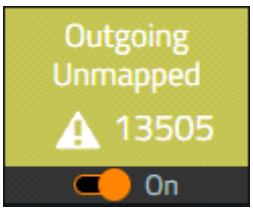
      The Add Remote Mapping dialog opens.
   b. Do one of the following:
      - Type the entity class enumeration in the input.
      - Use the enumeration drop-downs for each enumeration category.
   c. Click **Add**.
4. Close the Mapping dialog.

   VBS Gateway updates the Active Entities page.
5. Repeat steps 2 through 4 for each *Unmapped* entity.

The outgoing mappings are fixed, using the Active Entities page.

6.9.2.2.2 Using the Mappings Page

Alternatively, use the Outgoing Unmapped Category button to fix the outgoing mappings.



To assign missing Entity Classes to VBS4 models, detect and fix unmapped entities.

Follow these steps:

1. Open the Mappings page and use the filters to display only Outgoing Unmapped entities.
2. Select a row for the Outgoing Unmapped entity, and click the **Edit** icon.

   The Mapping dialog opens.
3. To edit the Entity Class:
   a. In the **Outgoing** section, click **Add Remote Mapping**.

      The Add Remote Mapping dialog opens.
   b. Do one of the following:
      - Type the entity class enumeration in the input.
      - Use the enumeration drop-downs for each enumeration category.
   c. Click **Add**.
4. Close the Mapping dialog.

   VBS Gateway updates the Mappings page.
5. Repeat steps 2 through 4 for each *Outgoing Unmapped* entity.

The outgoing mappings are fixed, using the Mappings page.

6.9.2.3 Detect and Fix Remote Entities

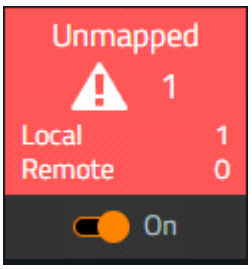
An entity in the remote simulation may not have a mapping in VBS4.

You can fix these incoming mappings either using the Active Entities page or the Mappings page (see Active Entities Page or Mappings Page in the VBS Gateway Manual).

- Using the Active Entities Page (on the next page)
- Using the Mappings Page (on page 88)

6.9.2.3.1 Using the Active Entities Page

Use the Unmapped Category button on the Active Entities page.



To assign missing VBS4 models to Entity Classes, detect and fix unmapped VBS4 classes.

Follow these steps:

1. Open the Active Entities Page (see Active Entities Page in the VBS Gateway Manual) and use the filters to display only Unmapped entities.
2. Select an unmapped Remote Ownership row, and click the **Edit** icon.

   The Mapping dialog opens.
3. To modify the VBS4 model to use:
   a. Click **Change VBS Model**.

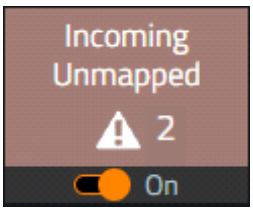
      The Select VBS Model page opens.
   b. Use the **Search** input and click **OK** to filter the list.
   c. Select a model from the list and click **OK**.
4. Close the Mapping dialog.

   VBS Gateway updates the Active Entities page.
5. Repeat steps 2 through 4 for each *Unmapped* entity.

The incoming mappings are fixed, using the Active Entities page.

6.9.2.3.2 Using the Mappings Page

Alternatively, use the Incoming Unmapped Category to fix the incoming mappings.



To assign missing VBS4 models to Entity Classes, detect and fix unmapped VBS4 classes.

Follow these steps:

1. Open the Mappings page and use the filters to display only Incoming Unmapped entities.
2. Select a row for the Unmapped entity, and click the **Edit** icon.

   The Mapping dialog opens.
3. To modify the VBS4 model to use:
   a. Click **Change VBS Model**.

      The Select VBS Model page opens.
   b. Use the **Search** input and click **OK** to filter the list.
   c. Select a model from the list and click **OK**.
4. Close the Mapping dialog.
5. Repeat steps 2 through 4 for each *Incoming Unmapped* entity.

The incoming mappings are fixed, updating the Mappings page.

6.9.2.4 Modify the Simulation Settings

To control the appearance and performance of incoming remote entities in VBS4 and outgoing VBS4 entities in the remote simulation, modify the entity settings.

- Open the **Settings** page and review the Dead Reckoning and Filtering settings.

For more information, see Configure General Settings in the VBS Gateway Manual.

> **NOTE**
>
> Changing settings restarts the VBS Gateway adapter. If a mission is running, remote entities disappear and then reappear.

6.9.3 Communications Monitoring

Communication Administrators use the UI Header to monitor the communications status of VBS Gateway and the Settings page (see Settings Page in the VBS Gateway Manual) to modify communications parameters as required.

Click **Stats On** to view the current status.

VBS Version	The version of the VBS4 instance.
Gateway Version	The version of VBS Gateway.
VBS Status	The current status of the VBS4 instance.
VBS Uptime	Displays how long the current VBS4 instance has been running.
Mission Uptime	Displays how long the network mission has been running.
Adapter Indicator	**Description**
Transmitting 	Indicates whether VBS4 is transmitting messages to the network: • Grey - VBS Gateway is not transmitting messages. • Green - VBS Gateway is currently transmitting messages. The frequency of blinks corresponds to the current traffic load. **Out:** The number of messages received per second.

Receiving 	Indicates whether VBS4 is receiving messages from the network: • **Grey** - VBS Gateway is not receiving messages. • **Green** - VBS Gateway is currently receiving messages. The frequency of blinks corresponds to the current traffic load. **In:** The number of messages sent per second.

In any situation where VBS Gateway is not receiving or sending during the mission, verify the communications settings.

- Open the Settings page (see Settings Page in the VBS Gateway Manual) and review the appropriate settings for that protocol.

For more information, see Configure VBS Gateway in the VBS Gateway Manual.

NOTE

Changing settings restarts the VBS Gateway adapter. If a mission is running, remote entities disappear and then reappear.

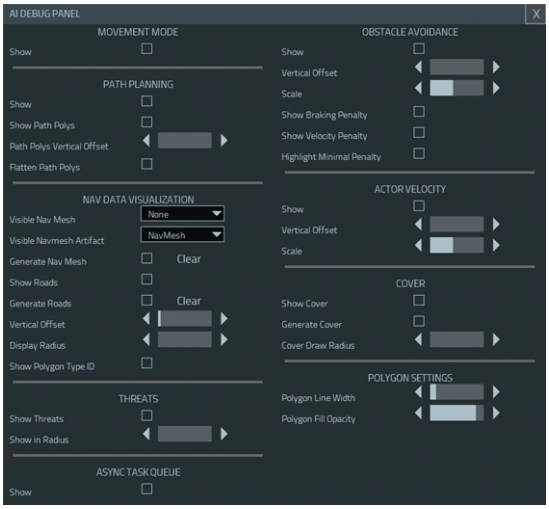
6.10 Control AI Visualization

Control AI has several visualization options available to Control AI users and developers.

For civilian debug visualization, see Debug Visualization (on page 111).

These visualization options, such as path-planning and navigation-mesh visualizations, for both military and civilian Control AI, are available in the AI Debug Panel.

To open the AI Debug Panel, in the VBS4 Editor, open the menu **Control AI > AI Debug Panel**.



To hide all debug visualizations, in the VBS Editor main menu, select **Control AI > Hide AI Debug Panel**. To switch them on again, select **AI Debug Panel**.

You can visualize the following:

- Movement Mode (on the next page) - Shows the Behavior Tree (BT) movement node that is currently running in the entity behavior (if there is any).
- Path-Planning (on page 93) - Visualizes Control AI entities, when they are path planning.
- Navigation Mesh (on page 95) - Visualizes navigation meshes, used by humanoid and vehicle entities, when navigating around the terrain (for more information, see Navigation Meshes (on page 119)).
- Threats (on page 101) - Visualizes various threats to Control AI entities.
- Cover (on page 102) - Visualizes places on the terrain, where Control AI entities can take cover.
- Async Task Queue (on page 104) - Controls asynchronous visualization tasks for path-planning, navigation mesh updates, or cover queries.
- Obstacle Avoidance (on page 104) - Visualizes obstacles, so that they can be avoided by Control AI entities.
- Actor Velocity (on page 106) - Visualizes actor (Control AI entity) velocity, when dismounted from a vehicle, or when in a wheeled / tracked vehicle.

6.10.1 Movement Mode

Shows the movement Behavior Tree (BT) node that is currently running in the entity behavior (if there is any).

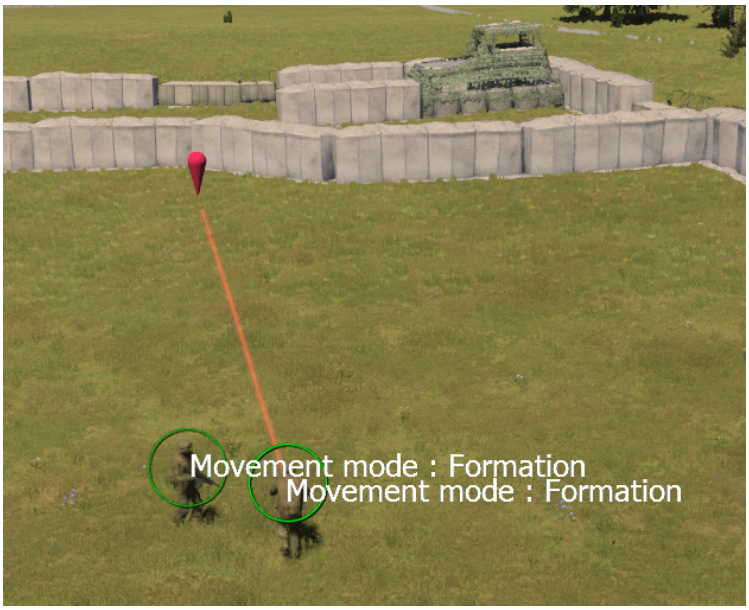
For more information on BT nodes, see Behavior Tree Node Reference in the VBS Control Editor Manual.

> **NOTE**
>
> The settings in this section allow you to display the visualizations only for selected Control AI entities. If no Control AI entities are selected, the visualizations are displayed for all Control AI entities.

The BT node visualizations can be:

- **Empty** - If no movement is happening.
- **Position** - When a **Move** BT node is running (when the entity is trying to reach a specific destination).
- **Formation** / **Follow Entity** / **Follow Entity With Offset** / **Vehicle Parking** - If one of these BT nodes is running.

Image-5: Formation movement mode



Follow these steps:

1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Movement Mode** section of the panel, set the following settings:
    - Show (on the next page)

6.10.1.1 Show

Shows / hides the movement-mode visualization.

6.10.2 Path-Planning

An entity path is either a planned path on the navigation mesh, or, if the entity is following a moving formation and there is no obstruction between its desired position and itself, the movement target that is displayed.

> **NOTE**
>
> The settings in this section allow you to display the visualizations only for selected Control AI entities. If no Control AI entities are selected, the visualizations are displayed for all Control AI entities.

The path is visualized in the 3D view, using the following lines:

- **White line** - A straight line to the destination, if path-finding is in progress.
- **Green line** - Represents the high-level (coarse) path to the destination, planned on the coarse navigation mesh.
- **Cyan line** - Represents the detailed path, planned on the detailed navigation mesh in the immediate vicinity of the entity.
- **Yellow line** - A straight line to the first corner of the detailed path.

> **NOTE**
>
> The red line is not part of the path-planning visualization.

Image-6: White line (left), and green, cyan, and yellow lines (right)

Follow these steps:

1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Path Planning** section of the panel, set the following settings:
    - Show (below)
    - Show Path Polys (on the next page)
    - Path Polys Vertical Offset (on the next page)
    - Flatten Path Polys (on the next page)
3. (Optional) Change the polygon line width and opacity for path-planning polygons in the Polygon Settings (on page 110).

6.10.2.1 Show

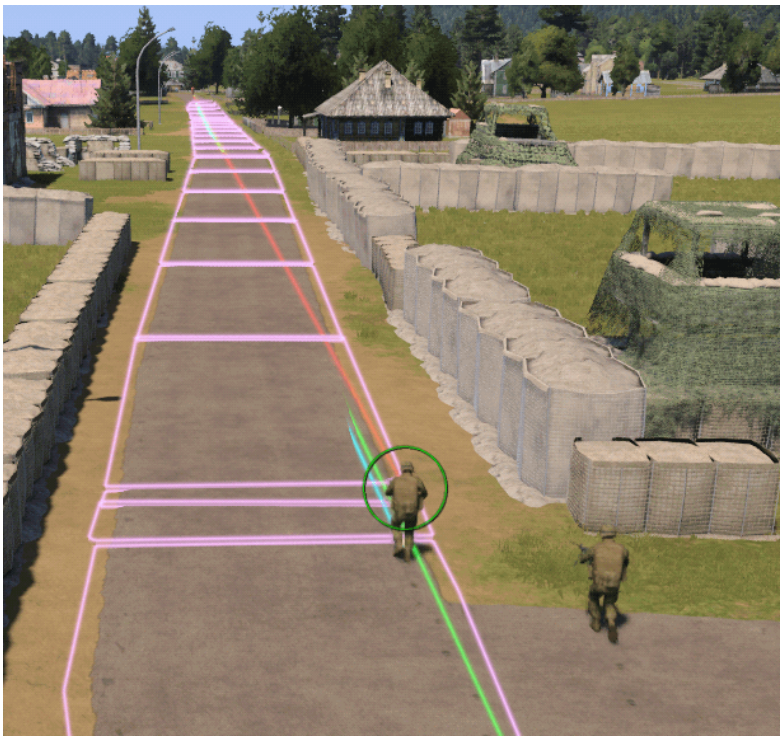
Shows / hides the path-planning visualization.

6.10.2.2 Show Path Polys

Shows / hides all the navigation mesh polygons that the path is traversing.

> **NOTE**
> The polygons are visible only if the path is found after this checkbox is enabled.

Image-7: Path polygons and a planned path



6.10.2.3 Path Polys Vertical Offset

A slider that can move the navigation-mesh polygons upwards in cases where the polygons do not copy the terrain precisely and may clip into it.

6.10.2.4 Flatten Path Polys

Makes sure that neighboring polygons are not slightly vertically offset from each other in an alternating fashion.

6.10.3 Navigation Mesh

Both the coarse and detailed navigation mesh can be displayed in 3D view.

This visualization shows the navigation-mesh polygons in a certain radius from the camera.

- The edges of impassable areas are colored red.
- Tile borders are colored blue.

- Polygon edges are colored pink.

Follow these steps:

1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Nav Data Visualization** section of the panel, set the following settings:
   - Visible Nav Mesh (below)
   - Visible Nav Mesh Artifact (on page 98)
   - Generate Nav Mesh (on page 99)
   - Show Roads (on page 99)
   - Generate Roads (on page 100)
   - Vertical Offset (on page 100)
   - Display Radius (on page 100)
   - Polygon Type ID (on page 100)
3. (Optional) Change the polygon line width and opacity for navigation-mesh polygons in the Polygon Settings (on page 110).

6.10.3.1 Visible Nav Mesh

Shows the navigation mesh. The navigation mesh can be of the following types:

WARNING

If the navigation mesh is not yet generated, make sure that Generate Nav Mesh (on page 99) is checked. Otherwise, the visualization does not get displayed.

- **None** - No navigation mesh is shown.
- **Humanoid** - Shows the navigation mesh for humanoid entities.
- **Vehicle** - Shows the navigation mesh for vehicle entities.
- **Coarse** - Shows the coarse navigation mesh.

Image-8: The navigation mesh designated using color-filled polygons

When **Visible Nav Mesh** is on, the following information is also displayed, based on the navigation-mesh types:

```
NavMesh tile count:
  humanoid: 19
  vehicle: 4
  coarse: 1
```

NOTE

Unit and vehicle entities use Clearance, indicating which entities can pass through a particular terrain segment. A Clearance level is visualized using the letter **C**, a level number, and a specific color. The higher the level, the bigger the entity that can pass through. Unit entities only have one Clearance level.

Image-9: C1, C2, and C3 Clearance levels, with different polygon colors

6.10.3.2 Visible Nav Mesh Artifact

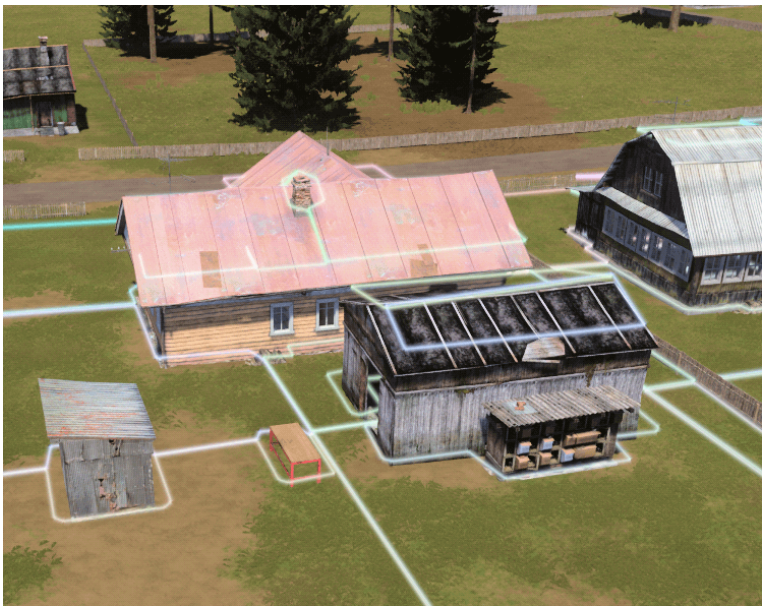
This setting allows you to only visualize a specific part (artifact) of the navigation mesh.

> **WARNING**
>
> If the navigation mesh is not yet generated, make sure that Generate Nav Mesh (on the next page) is checked. Otherwise, the visualization does not get displayed.

The available artifacts are:

- **NavMesh** - The final navigation mesh.
- **Heightfield** - Voxels containing spans that completely encompass the surface of all polygons in the source geometry.
- **Compact Heightfield** - The tops of the heightfield, representing the potential traversable surfaces on top of the solid space.
- **Contours** - Polygons with simplified edges, created from raw contours.
- **Heightfield Walkable** - Represents walkable areas.
- **Compact Heightfield Regions** - Represents compact regions of walkable areas.
- **Raw Contours** - Highly detailed polygons, generated from the regions.
- **Region Connections** - Neighboring regions to which entities can move.
- **Poly Mesh** - Same as **NavMesh**.
- **Poly Mesh Detail** - Triangulated contour polygons.

Image-10: Contours visualization



6.10.3.3 Generate Nav Mesh

When this setting is turned on, both detailed and coarse navigation mesh are automatically generated inside the Display Radius (on the next page) around the 3D camera.

When this setting is turned off, only the already generated navigation mesh is displayed.

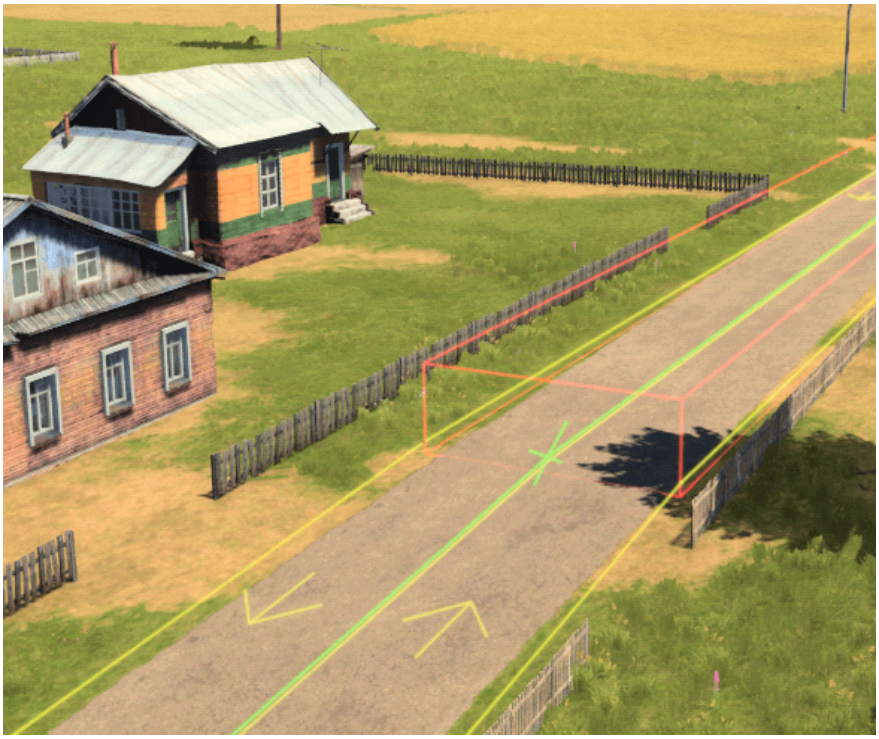
Click **Clear** to manually reset the navigation-mesh data for further navigation-mesh visualizations.

6.10.3.4 Show Roads

Shows / hides the road network data:

- Green and red lines represent the road network. Green lines represent connected segments, and red lines represent unconnected road segments.
- Yellow arrows represent the direction of travel for right-hand traffic.
- Yellow lines represent lane boundaries.
- 3D visualization options used in civilian AI visualizations. For more information, see Debug Visualization (on page 111).

Image-11: Show Roads enabled



Use the **Show Roads** and Generate Roads (on the next page) options, when creating vehicle traffic.

For additional traffic visualization options, see Traffic Debug Visualization (on page 115).

6.10.3.5 Generate Roads

When this setting is turned on, the road network is automatically generated inside the Display Radius (below) around the 3D camera.

When this setting is turned off, only the already generated road network is displayed.

Click **Clear** to manually reset the road-network data for further road visualizations.

6.10.3.6 Vertical Offset

Changes the vertical offset of the navigation mesh and road network, if it is clipping into the terrain.

6.10.3.7 Display Radius

Adjusts the display radius (between 50 - 300m) of the visualized navigation mesh and road network.

6.10.3.8 Polygon Type ID

The polygon type. Can be:

- **D** - Default - Lacks safety.
- **S** - Safe - Preferred Polygons.
- **R** - Roads.
- **F** - Footpath. Currently, in combination with the **R** flag, it means a crosswalk. In the future, it is expected the **F** flag will be used for sidewalks, trails, and other surfaces designated for pedestrians.
- **C** - Clearance level, indicating which entities can pass through a particular terrain segment. A Clearance level is visualized using the letter **C**, a level number, and a specific color. The higher the level, the bigger the entity that can pass through.

> **NOTE**
>
> A polygon can be of more than one type. The only exception is "**DS**", since Dangerous and Safe are mutually exclusive.

6.10.4 Threats

You can display threats in the given radius from the current position in 3D view.

Follow these steps:

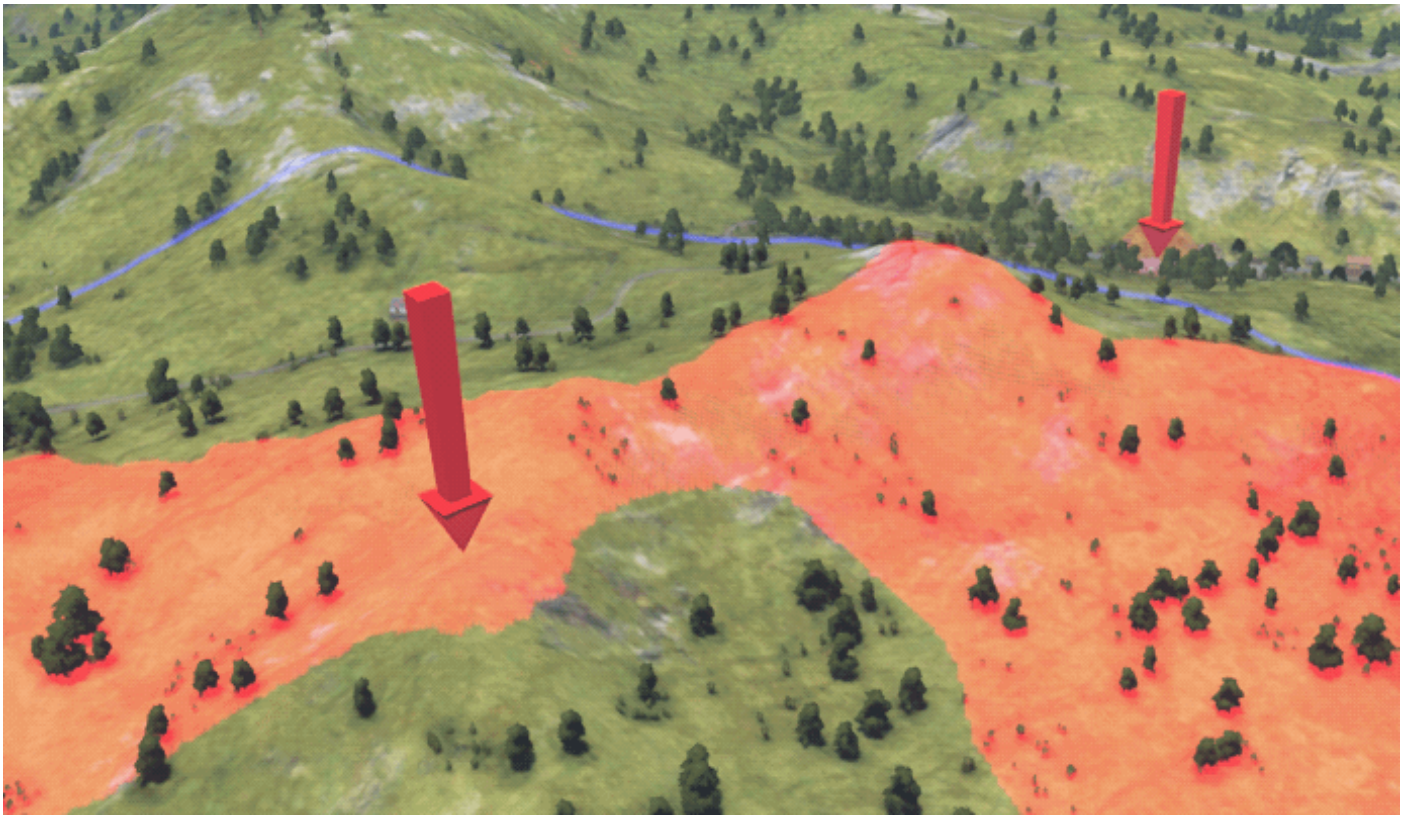
1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Threats** section of the panel, set the following settings:
    - Show Threats (below)
    - Show in Radius (on the next page)

6.10.4.1 Show Threats

Shows / hides threats.

- The area under threat shows as a grid of red lines.
- The point on the threat grid always consists of at least 2 red lines. The vertical line means that the area is under threat, while the other lines point to the threat (each line points only to one threat).
- Threat radius shows as a blue circle around the threat.

Image-12: Threats visualized



6.10.4.2 Show in Radius

The radius (50 - 300m) at which the threat is visualized.

> **NOTE**
> A bigger radius may affect performance.

6.10.5 Cover

You can display the cover which is available within a certain radius of the current position in 3D view.

> **NOTE**
> The simulation must be running for the cover visualization to work.

Follow these steps:

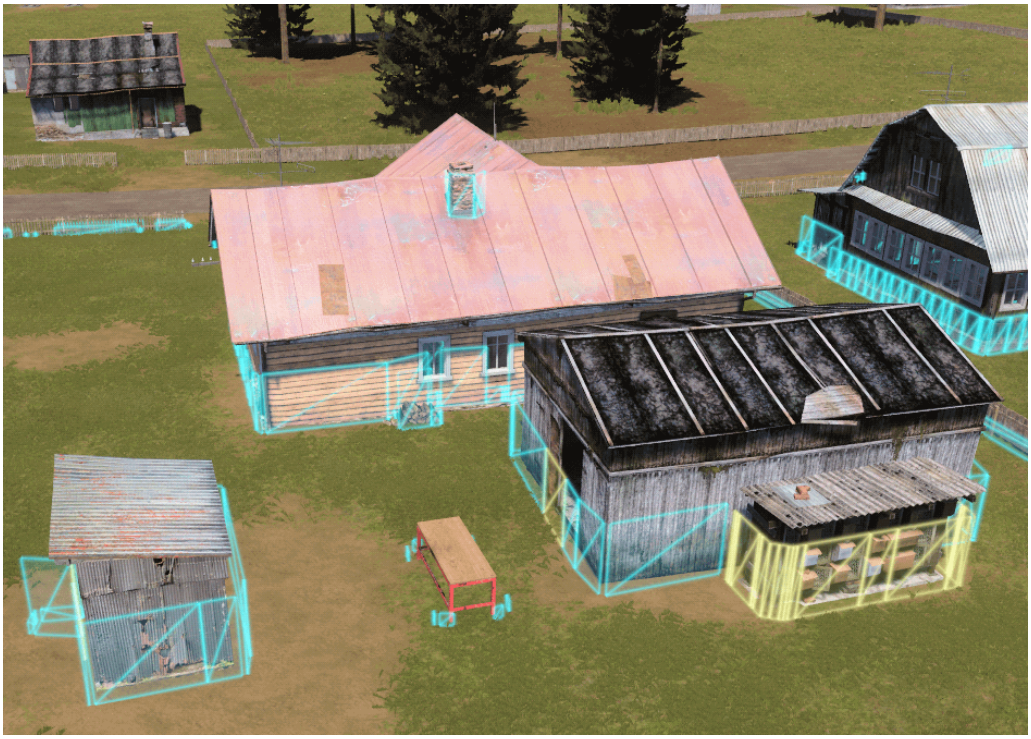
1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Cover** section of the panel, set the following settings:
   - Show Cover (on the next page)
   - Generate Cover (on the next page)
   - Cover Draw Radius (on page 104)
3. (Optional) Change the polygon line width and opacity for cover polygons in the Polygon Settings (on page 110).

6.10.5.1 Show Cover

Shows / hides the cover visualization.

- The cover is displayed as blue rectangles. Concealment areas are displayed in yellow.
- The cover is not displayed immediately when you move the camera, it appears as it is generated.
- A color-filled cover indicates that you are viewing it from the front (a cover that is not color-filled indicates that you are viewing it from the back).
- A diagonal line from the bottom left corner to the top right corner indicates that you are viewing the cover from the front (a line from the bottom right corner to the top left corner indicates that you are viewing the cover from the back).

Image-13: The visualized cover (blue) with concealment areas (yellow)



6.10.5.2 Generate Cover

When this setting is turned on, cover is automatically generated inside the Cover Draw Radius (on the next page) around the 3D camera.

When this setting is turned off, only already generated cover is displayed.

6.10.5.3 Cover Draw Radius

The radius (50 - 300m) at which the cover is visualized.

> **NOTE**
>
> Setting a high radius and frequently moving the camera may have an impact on performance.

6.10.6 Async Task Queue

You can visualize the number of asynchronous tasks such as path-planning, navigation mesh updates, or cover queries that are still unfinished and pending to be completed at any given time. A non-zero number can indicate how much time it takes for entities to start spawning using the Control AI - Civilian Editor Object in the VBS Control AI Manual.

Follow these steps:

1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Async Task Queue** section of the panel, toggle the **Show** setting, to show / hide the number of pending asynchronous tasks.

6.10.7 Obstacle Avoidance

You can visualize the obstacle avoidance of an actor (Control AI entity).

> **NOTE**
>
> The settings in this section allow you to display the visualizations only for selected Control AI entities. If no Control AI entities are selected, the visualizations are displayed for all Control AI entities.

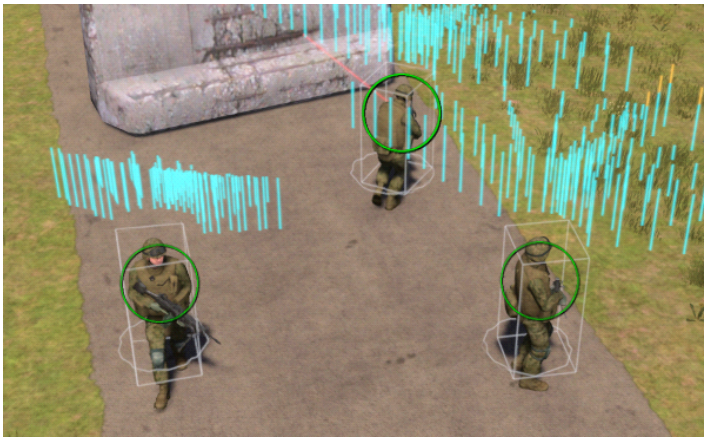
In order to determine the optimal velocity for following a planned path while avoiding obstacles, the following is done:

1. Velocities are sampled.
2. A penalty for each velocity is calculated.
3. The velocity with the lowest penalty is selected.

The penalty is displayed as a vertical bar, consisting of two components:

- **Braking Penalty (orange color**) - Proportional to the deceleration needed to avoid a collision.
- **Velocity Penalty (cyan color)** - Deviance from planned velocity.

Image-14: Obstacle avoidance visualized



Follow these steps:

1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Obstacle Avoidance** section of the panel, set the following settings:
    - Show (below)
    - Vertical Offset (below)
    - Scale (below)
    - Show Braking Penalty (below)
    - Show Velocity Penalty (on the next page)
    - Highlight Minimal Penalty (on the next page)

6.10.7.1 Show

Shows / hides the obstacle avoidance visualization.

6.10.7.2 Vertical Offset

Changes the vertical offset of the displayed penalty bars.

6.10.7.3 Scale

Changes the scale of the displayed penalty bars.

6.10.7.4 Show Braking Penalty

Shows / hides an orange bar for each sampled velocity. The height of the bar is proportional to the braking penalty.

6.10.7.5 Show Velocity Penalty

Shows / hides a cyan bar for each sampled velocity. The height of the bar is proportional to the velocity penalty.

6.10.7.6 Highlight Minimal Penalty

Shows / hides a green sphere, highlighting the sampled velocity with the lowest overall penalty.

6.10.8 Actor Velocity

You can visualize actor (Control AI entity) velocity. The visualization can differ, depending on whether an actor is in a vehicle or not.

> **NOTE**
>
> The settings in this section allow you to display the visualizations only for selected Control AI entities. If no Control AI entities are selected, the visualizations are displayed for all Control AI entities.

The different visualizations are:

- **Dismounted** - When dismounted from a vehicle.
  - **Planned Velocity (cyan arrow)** - Velocity for following the planned path on the navigation mesh.
  - **Wanted Velocity (blue arrow)** - Velocity for following the planned path, while avoiding collision.
  - **Current Velocity (magenta arrow)** - Immediate velocity of the actor.

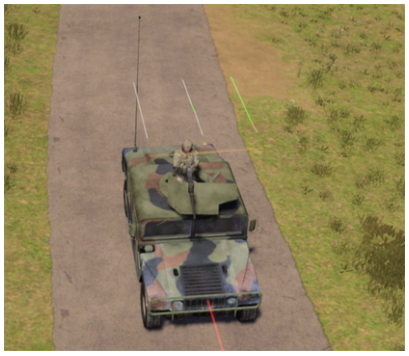
Image-15: Dismounted actor velocity

- **Wheeled Vehicle** - When in a wheeled vehicle.
  - **Front Indicator** - Indicates steering:
    - Yellow indicates the level of steering in a given direction.
  - **Left Indicator**- Indicates speed:

    When acceleration is wanted:
    - Green indicates the current speed.
    - Green + yellow indicate the wanted speed.

    When deceleration is wanted:
    - Green + red indicate the current speed.
    - Green indicates the desired speed.
  - **Middle Indicator** - Indicates throttle:
    - Green indicates the level of forward throttling.
    - Cyan indicates the level of backward throttling.
  - **Right Indicator** - Indicates braking:
    - Red indicates the level of braking.

Image-16: Wheeled vehicle velocity



- **Tracked Vehicle** - When in a tracked vehicle.
  - **Left Indicator** - Indicates speed:

    When acceleration is wanted:

    - Green indicates the current speed.
    - Green + yellow indicate the wanted speed.

    When deceleration is wanted:

    - Green + red indicate the current speed.
    - Green indicates the desired speed.
  - **Two Middle Indicators** - Indicate left and right throttle:
    - Green indicates the level of forward throttling.
    - Cyan indicates the level of backward throttling.
  - **Right Indicator** - Indicates braking:
    - Red indicates the level of braking.

Image-17: Tracked vehicle velocity

- **Rotary-Wing Vehicle** - When using a rotary-wing vehicle.
  - **Front Indicator** - Indicates rotation:
    - Yellow indicates the level of rotation in a given direction.
  - **Left Indicator**- Indicates speed (without direction):

    When acceleration is wanted:
    - Green indicates the current speed.
    - Green + yellow indicate the wanted speed.
    - Gray indicates the maximum speed.

    When deceleration is wanted:
    - Green + red indicate the current speed.
    - Green indicates the wanted speed.
    - Gray indicates the maximum speed.
  - **Middle Indicator** - Indicates velocity (speed with direction):
    - Cyan indicates the current velocity.
    - Blue indicates the wanted velocity.

Image-18: Rotary-wing vehicle velocity

Follow these steps:

1. Select the menu option **Control AI > AI Debug Panel**.
2. In the **Actor Velocity** section of the panel, set the following settings:
   - Show (on the next page)
   - Vertical Offset (on the next page)
   - Scale (on the next page)

6.10.8.1 Show

Shows / hides the actor velocity visualization.

6.10.8.2 Vertical Offset

Changes the vertical offset of displayed arrows / indicators.

6.10.8.3 Scale

Changes the scale of the displayed arrows.

6.10.9 Polygon Settings

This section contains the Polygon Settings.

6.10.9.1 Polygon Line Width

Control the polygon line width.

6.10.9.2 Polygon Fill Opacity

Controls how opaque the polygons are.

6.10.10 Debug Visualization

The Population Editor Object (see Population Editor Object in the VBS Control AI Manual) has civilian AI visualizations, which can be used for debugging purposes.

For general Control AI visualizations, see Control AI Visualization (on page 91).

> **NOTE**
> The visualizations are only displayed in the 2D and 3D views of VBS Editor (Execute Mode).

Follow these steps:

1. Double-click the Population (**Control AI - Civilian**) Editor Object.
2. Select **Debug Visualization**, and set any of the available debug options:

   3D Visualization Options;

   - Display Narrow Roads (on the next page)
   - Display Problematic Turns (on the next page)
   - Display Problematic Intersections (on page 113)
   - Display Objects Interfering with Road Traffic (on page 113)

   2D Visualization Options:

   - Display Junctions for Crosswalks and Crossroads (on page 114)
3. Click **Apply Selected**, to activate the debug options.

The visualizations are activated in the population area.

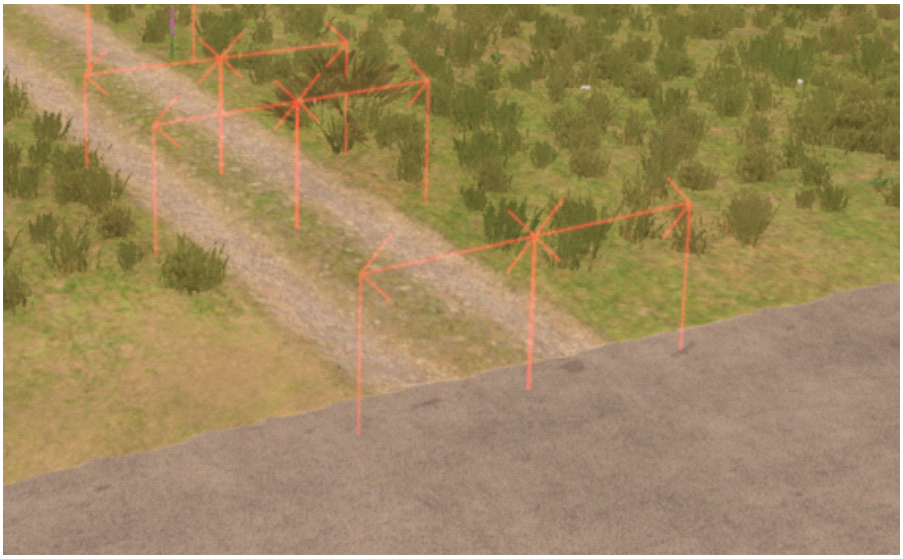
> **NOTE**
> The Civilian AI visualizations only apply to the Control AI - Civilian Editor Object selected in step 1, and not to any other Control AI - Civilian Editor Objects on the map.

6.10.10.1 Display Narrow Roads

Displays road sections that are too narrow to drive through.

This option can assist with defining the vehicle traffic flow. For more information, see Define Traffic Flows in the VBS Control AI Manual.

Image-19: Road section that is too narrow

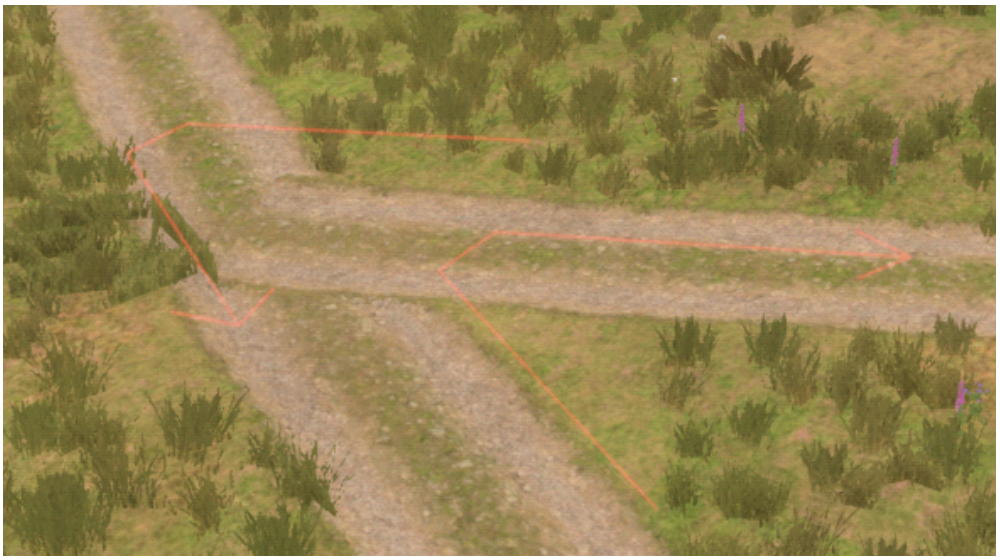


6.10.10.2 Display Problematic Turns

Displays road turns that cars cannot use properly.

This option can assist with defining the vehicle traffic flow. For more information, see Define Traffic Flows in the VBS Control AI Manual

Image-20: Problematic turn



6.10.10.3 Display Problematic Intersections

Displays junction pairs that are too close to each other, which can cause cars to get stuck.

This option can assist with defining the vehicle traffic flow. For more information, see Define Traffic Flows in the VBS Control AI Manual

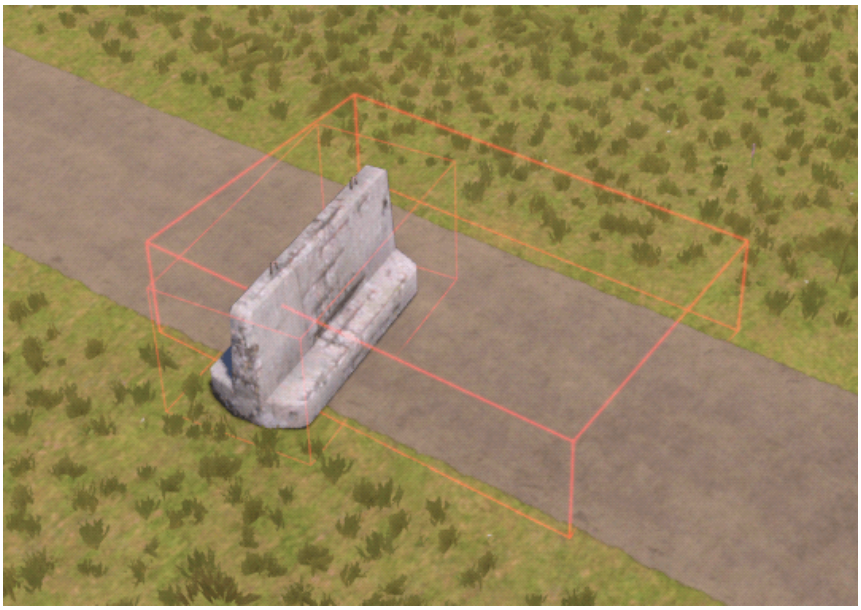
Image-21: Problematic intersection

6.10.10.4 Display Objects Interfering with Road Traffic

Displays any objects that prevent cars from driving on roads.

This option can assist with defining the vehicle traffic flow. For more information, see Define Traffic Flows in the VBS Control AI Manual

Image-22: The red cube indicates road interference



6.10.10.5 Display Junctions for Crosswalks and Crossroads

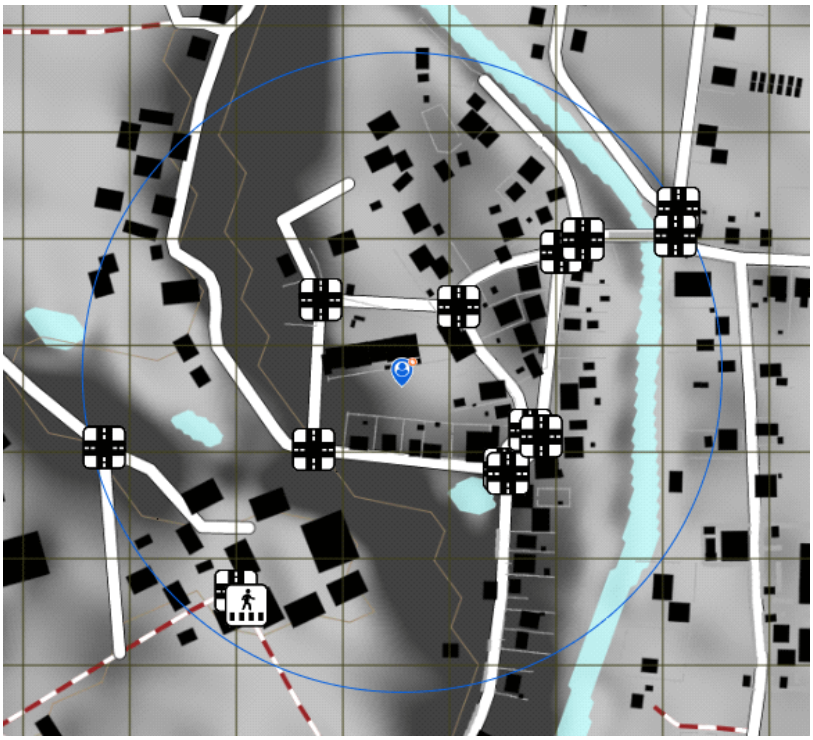
Displays several visualizations for crosswalks and crossroads (junctions).

This option can assist with defining the pedestrian and vehicle traffic flows. For more information, see Define Pedestrian Flows and Define Traffic Flows in the VBS Control AI Manual.

The visualizations are:

Icon	Description	Icon	Description
	Indicates a junction with crosswalks and without traffic lights.		Indicates a crosswalk.
	Indicates a junction with crosswalks and correctly placed traffic lights.		Indicates a crosswalk with correctly placed traffic lights.
	Indicates a junction with crosswalks and incorrectly placed traffic lights.		Indicates a crosswalk with incorrectly placed traffic lights.

Image-23: Visualized crosswalks and crossroads



6.10.11 Traffic Debug Visualization

Visualize traffic rules by enabling the traffic debug visualization to gain insight into AI driver intent.

Enable traffic debug visualization using the fn_vbsCon_civ_setTrafficDebug (https://sqf.bisimulations.com/display/SQF/fn_vbsCon_civ_setTrafficDebug) SQF function.

TIP

Additional traffic debug visualization can be activated, using the following Civilian **Debug Visualization** UI options (see Debug Visualization):

- **Display Narrow Roads**
- **Display Problematic Turns**
- **Display Problematic Intersections**
- **Display Objects Interfering with Road Traffic**
- **Display Junctions for Crosswalks and Crossroads**

For multi-lane traffic, you can either use the **AI Debug** option in VBS Geo (see VBS Geo User Interface in the VBS Geo Manual), or the **Show Roads** and **Generate Roads** options in the AI Debug Panel (see Control AI Visualization (on page 91)), to see how your road network is set up. Also, to configure road lanes, see **Lanes** in Placing and Editing Roads in the VBS Geo Manual.

fn_vbsCon_civ_setTrafficDebug

An SQF function that enables / disables traffic debug visualization.

NOTE

This SQF function only works with civilian vehicles created using the Population Editor Object (see Population Editor Object in the VBS Control AI Manual).

The traffic debug visualization consists of the following, which can be enabled separately:

- `"shape"` - Displays the collision shape of the junction.
- `"entities"` - Displays the intent of vehicles or pedestrians interacting with junctions.
- `"trafficLightAreas"` - Displays the areas where traffic lights are expected.
- `"trafficLightAssignment"` - Displays traffic light assignment to roads or crosswalks.
- `"connections"` - Displays valid paths through the junction, and whether they are free, in use, or blocked.

Syntax:

```
options call fn_vbsCon_civ_setTrafficDebug
```

Parameters:

- `options`: Array of Strings - Contains the visualization options to enable. To enable all the options, use `"all"`; or `"none"`, to disable all of them.

Return Values: Nothing

EXAMPLE

```
["connections", "entities"] call fn_vbsCon_civ_setTrafficDebug
["all"] call fn_vbsCon_civ_setTrafficDebug
["none"] call fn_vbsCon_civ_setTrafficDebug
```

With the visualization enabled, all junctions in civilian areas of all instances of the Population Editor Object (see Population Editor Object in the VBS Control AI Manual) display a representation of their current state. The visualization consists of the following elements:

- Orange boxes, enabled by the `"shape"` option, represent the area considered part of the junction.
- Arrows through the junction, enabled by the `"connections"` option, represent the directions possible to pass through the junction.

Image-24: Junction visualization with no vehicles present

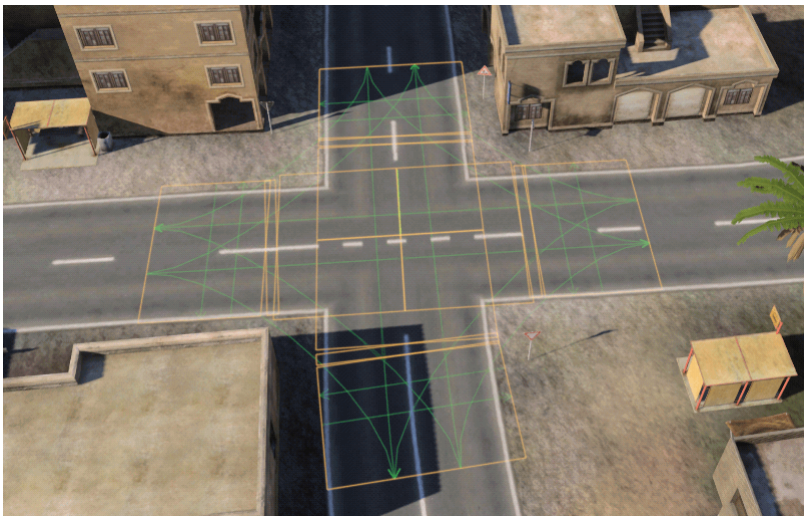
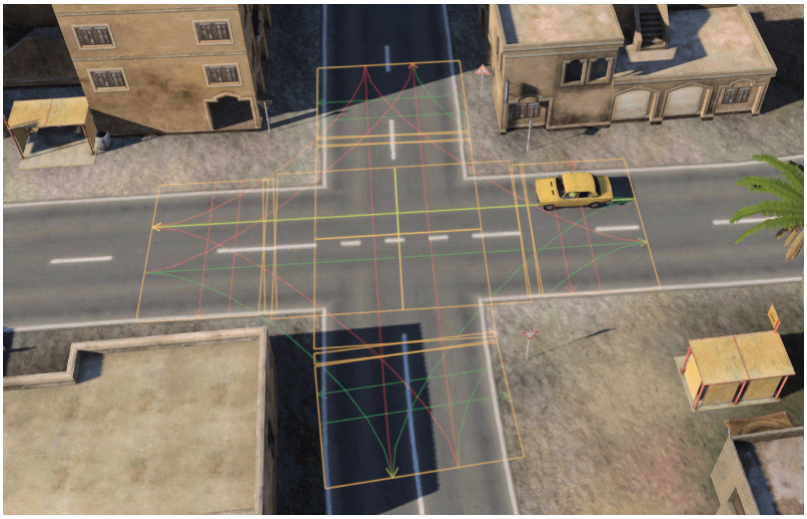


Image-25: Junction visualization with a vehicle passing through, blocking the intersecting road



The `"entities"` option enables a visual representation of intent that civilian entities have when approaching a junction. This visualization has the following elements:

- The arrows represent the direction that the entity takes, when entering and leaving the junction.
- The visualization is green when the entity is free to pass through, and turns red when the entity does not have priority or the direction is blocked.

Image-26: Entity intent visualization for an entity passing from left to right

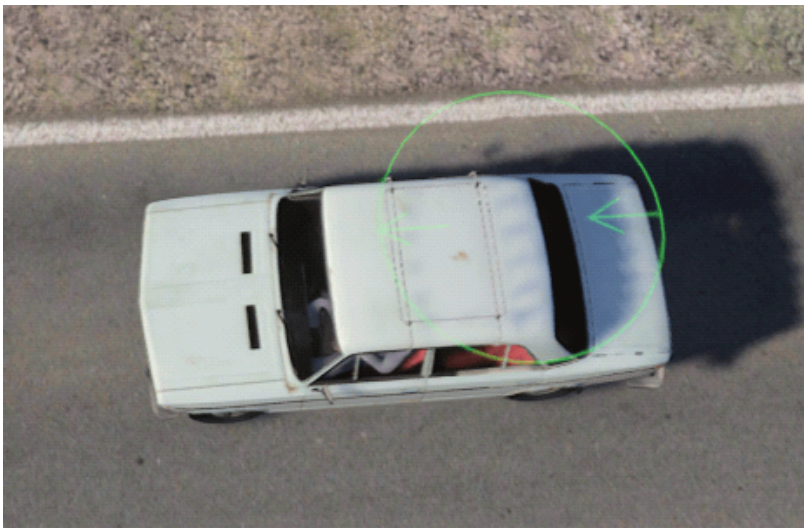
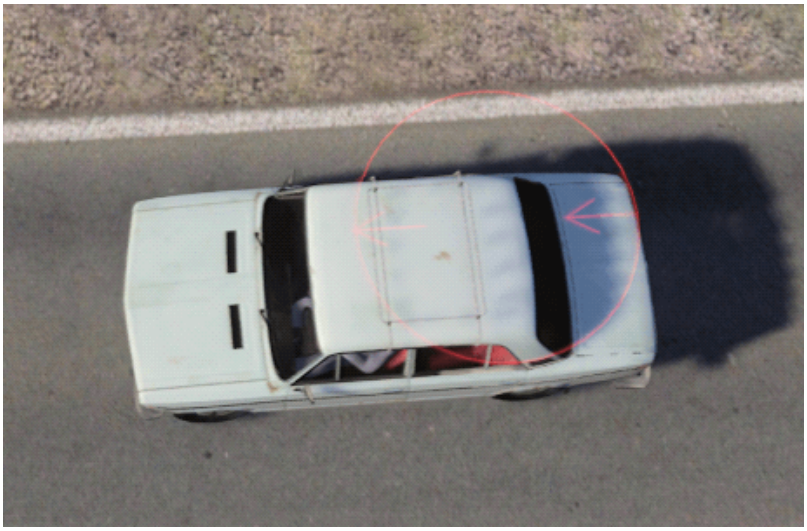


Image-27: Entity intent visualization for the same entity, when it does not have priority



6.10.12 Navigation Meshes

The most essential feature of Control AI entities is movement. To determine how to get from one point to the next, the Control AI uses navigation meshes. A navigation mesh is composed of convex polygons that cover traversable areas on the terrain, including both interiors and exteriors. To see why a Control AI entity moves in a specific way, you can visualize its navigation meshes (see Control AI Visualization (on page 91)).

The Control AI uses two navigation meshes, with differing levels of detail.

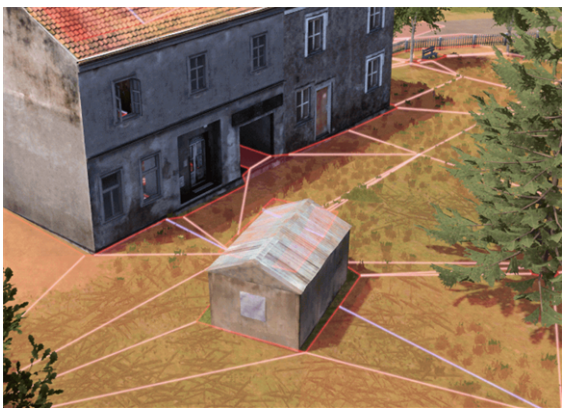
- **Coarse Navigation Mesh** - Only considers very large impassable obstacles, such as bodies of water, cliff faces, or ravines. A Control AI entity uses this navigation mesh to construct a high-level path to the destination.
- **Detailed Navigation Mesh** - Includes all the details about the environment, such as individual trees, walls, or building interiors. This navigation mesh is generated at runtime, and for performance reasons, only in the immediate vicinity of the entity, and some distance ahead along the high-level path. The detailed mesh is used to construct a detailed path that determines the specific steps needed to navigate through the environment. It only contains static obstacles, such as buildings, trees, or stationary vehicles. Therefore, after a Control AI entity finds a path using the navigation mesh, that entity needs to avoid other entities, which may have planned their paths through the same points. The technique to avoid other non-static entities (people or vehicles) is called collision avoidance.

  There are two types of detailed navigation mesh:

  - **Humanoid Navigation Mesh** - Used for path-planning by Control AI entities on foot.
  - **Vehicle Navigation Mesh** - Used for vehicle path-planning that ignores roads, when the Control AI entity drives a vehicle. Vehicles are able to drive through "soft objects" (for example, bushes), which are not part of the navigation mesh.

To manually update a detailed navigation mesh, to reflect changes made in VBS Editor (Execute Mode), see Updating the Navigation Mesh at Runtime (on page 122).

An example navigation mesh, using Visible Nav Mesh (on page 96) and Generate Nav Mesh (on page 99) options.



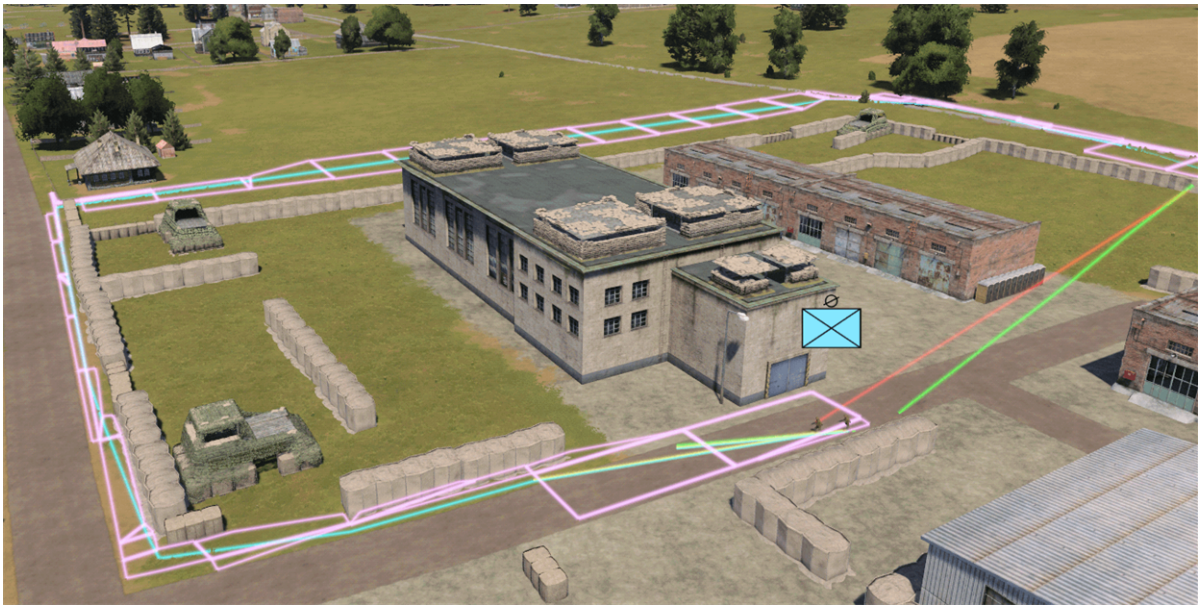
Navigation Mesh Limitations

An entity may be unable to find a path around very large obstacles.

The following situations might occur:

- A path around a long wall to the other side, where the entity stops before the wall, at the closest spot to its destination.
- A path that involves moving out of a big area which is completely surrounded by impassable walls, objects, and other buildings, so there is only one way from this complex (such as a military base, big garden / park, or cemetery, enclosed with fences).

The following image illustrates moving outside a complex of buildings and walls:

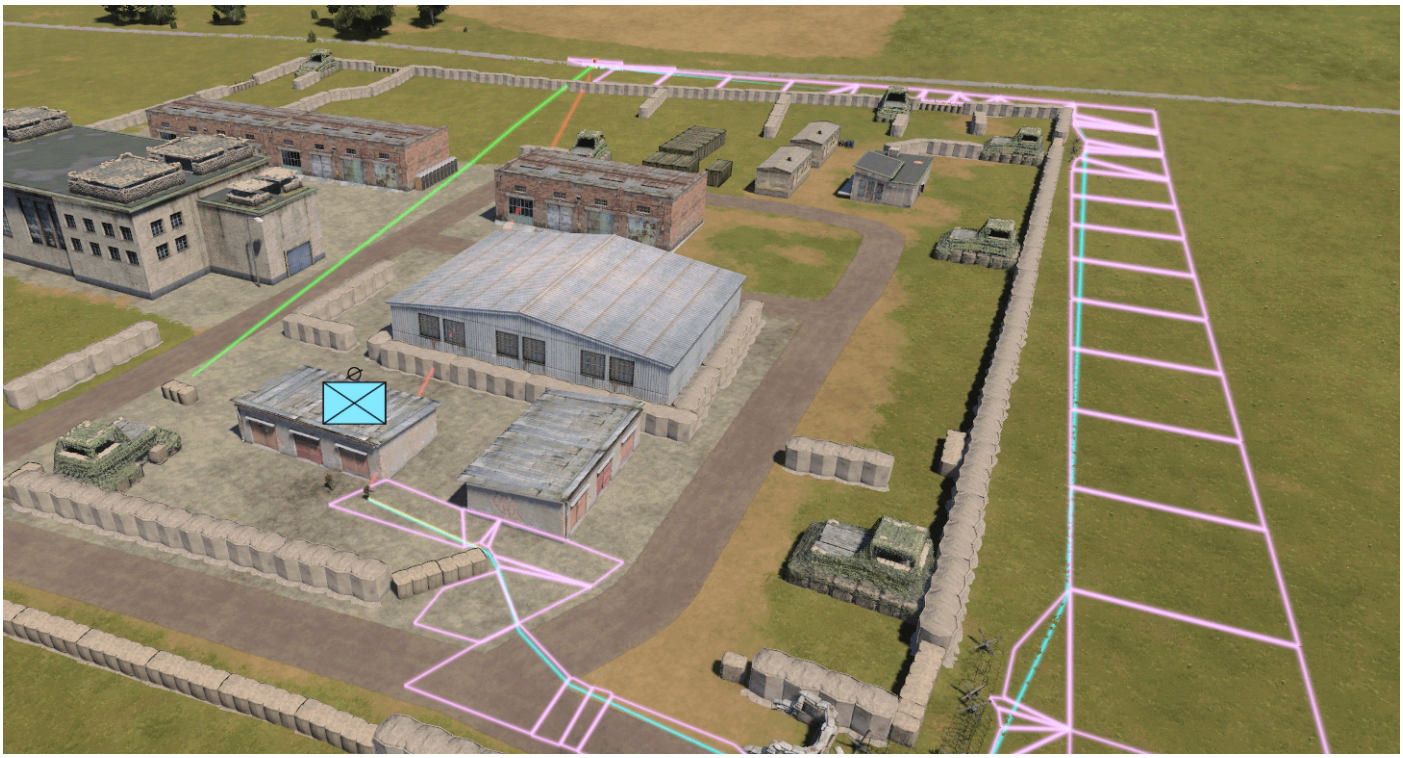


The following image illustrates that the exit from an enclosed area is too far away to be included in the search for a path around the coarse navigation mesh path (green line), during the move:

The following image illustrates that the obstacle is too big, and the entity cannot find a path around it, moving to the closest spot to its destination:

The workaround to the situation illustrated in the previous image is to place more Waypoints, to guide the entity around the obstacle (see Waypoints in the VBS Control AI Manual):

A different workaround is to create more entrances in the enclosed area. For example, you can achieve this by deleting a part of the wall:



6.10.12.1 Updating the Navigation Mesh at Runtime

You can manually update a part of a detailed navigation mesh (humanoid or vehicle) at runtime, using the markNavmeshOutdated (https://sqf.bisimulations.com/display/SQF/markNavmeshOutdated) SQF command.

> **NOTE**
>
> Since the navigation mesh updates automatically, running the command is optional and allows to manually force the update, if necessary.

Follow these steps:

1. Perform your desired changes in VBS Editor (Execute Mode) in an area, where a detailed navigation mesh is already generated.

   > **NOTE**
   >
   > The detailed navigation mesh is generated as Control AI entities move through an area.

   > **TIP**
   >
   > You can use the **AI Debug Panel** (see Control AI Visualization (on page 91)) to see where a detailed navigation mesh is generated.

2. In VBS Editor (Execute Mode) menu, navigate to **Tools > Developer Console**.

3. In the **Code Field**, enter the following SQF code:

```
markNavmeshOutdated [2000, 10000, 4000, 12000];
```

4. Click **Execute**, to execute the code.

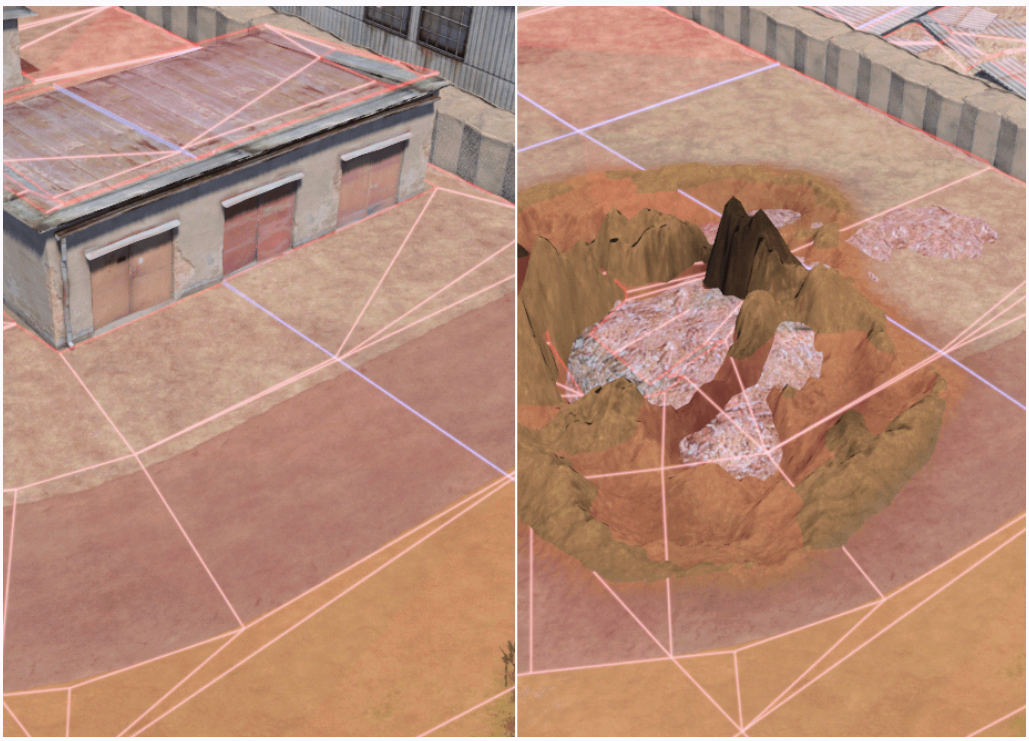
Observe that the detailed navigation mesh is updated the next time a Control AI entity moves through the area.

NOTE

Both humanoid and vehicle detailed navigation meshes are updated together.

EXAMPLE

Navigation mesh before (left image) and after (right image) marking an inset, containing a destroyed building, as outdated:



6.11 Monitoring the OPV River Class

As an administrator in Execute Mode, you can view the ship plan and directly switch to the interactive ship parts, as a player.

- Plan View (below)
- Other Execute Mode Interaction (on page 127)

For River Class ship mission design, see Designing OPV River Class Missions in the VBS4 Editor Manual.

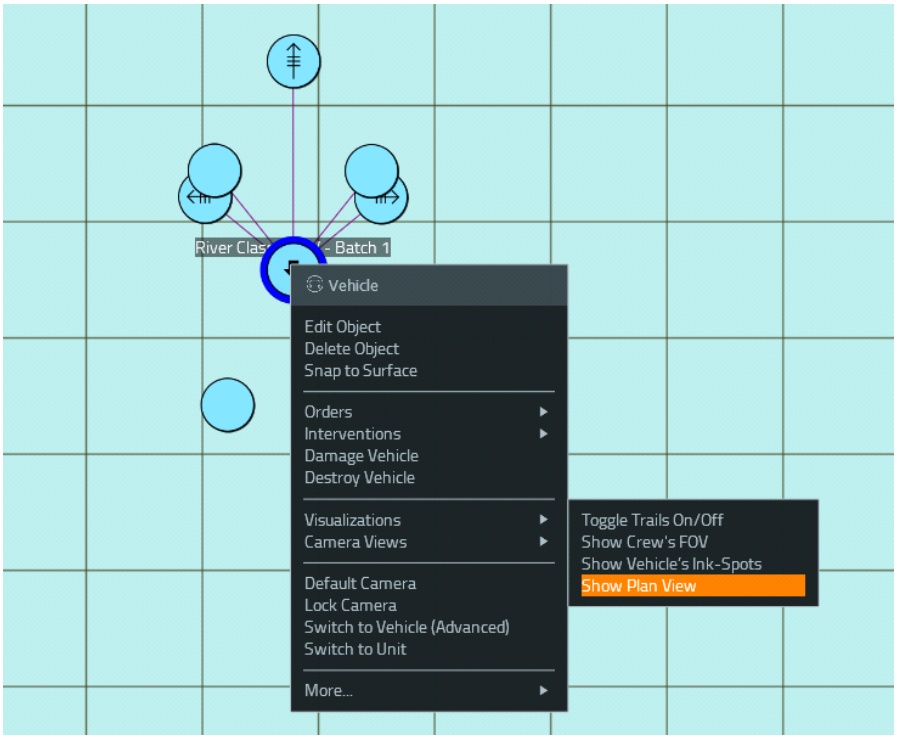
6.11.1 Plan View

You can view the River Class ship plan.

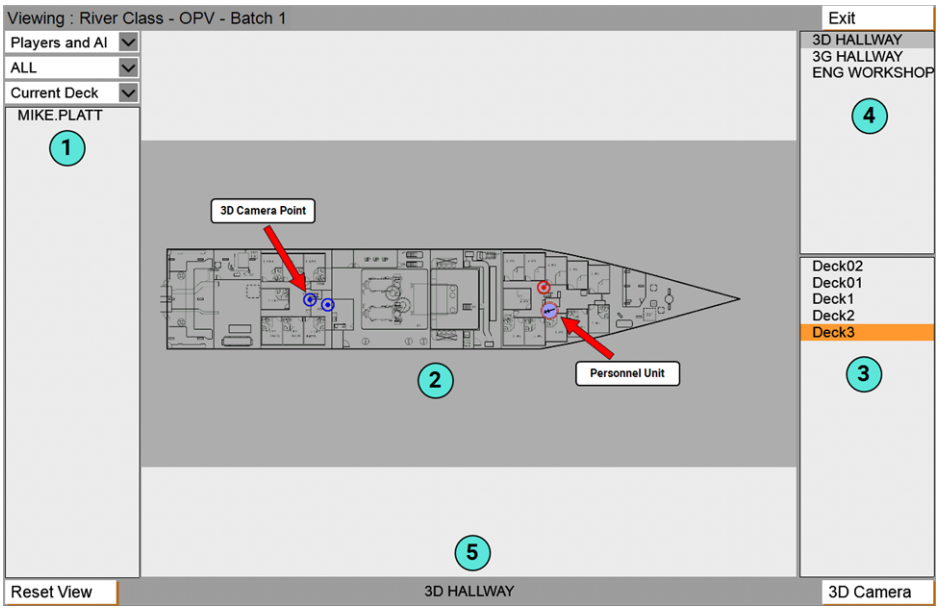
In the Execute Mode 2D View, right-click the ship, and select **Visualizations > Show Plan View** in the context menu.

The River Class ship Plan View dialog opens.

Image-28: Execute Mode Show Plan View option



In the **Plan View** dialog, use the following controls:



UI Element	Description
1	Ship personnel viewer, with three filter drop-downs.
2	Deck plan, which displays the 3D camera points and personnel units.
3	Deck selection.
4	Deck compartment selection.
5	Other controls.

The Plan View controls are:

Ship Personnel Viewer (UI Element 1 (above)):

Personnel Filters

- **(TOP) Control Filter** - Displays personnel, based on player and / or AI units:
  - **Players and AI** - Displays player and AI personnel.
  - **Players** - Displays only the player personnel.
  - **AI** - Displays only the AI personnel.
- **(MIDDLE) Unit Side Filter** - Displays personnel, based on their side.
  - **ALL** - Displays all the personnel.
  - **Civilian** - Displays the civilian personnel.
  - **BLUFOR** - Displays the BLUFOR personnel.
  - **OPFOR** - Displays the OPFOR personnel.
  - **Independent** - Displays the independent personnel.

- **(BOTTOM) Deck Filter** - Displays personnel, based on deck:
  - **Current Deck** - Displays personnel on the current deck (see current deck selection in UI Element 3 (on the previous page)).
  - **All Decks** - Displays personnel on all decks.

Personnel List

- The unit names appear in the personnel viewer, based on the filter criteria. Click any of the unit names, to see them highlighted on the deck plan (see UI Element 2 (on the previous page)).

Deck Plan (UI Element 2 (on the previous page)):

- **3D Camera Point:**
  1. Click one of the 3D camera points.
  2. Click **3D Camera**.

     The 3D camera view of the ship interior opens.
  3. Use the following camera controls:
     - Hold the **LMB** and move the mouse, to move the camera.
     - Press **Esc** to return to the Plan View dialog.
- **Personnel Unit:** Click one of the personnel units.

  The unit is highlighted in the Personnel List (above).

Deck Selection (UI Element 3 (on the previous page)):

Click one of the decks to display its plan (see UI Element 2 (on the previous page)).

Deck Compartment Selection (UI Element 4 (on the previous page)):

1. Double-click one of the deck compartments

   The compartment is zoomed in on it in the deck plan (see UI Element 2 (on the previous page)).
2. Click **Reset View**, to reset the plan zoom level.

Other Controls (UI Element 5 (on the previous page)):

- **Reset View** - Resets the plan zoom level.
- **3D Camera** - Switches to the 3D camera view (see UI Element 2 (on the previous page)).

To exit the Plan View dialog, press **Esc** or click **Exit**.

6.11.2 Other Execute Mode Interaction

The Execute Mode 2D View displays some of the interactive elements on board the River Class ship.

The displayed interactive elements include:

- The River Class ship itself
- The GAMBO gun
- Two GPMG turrets
- Two Signal Lamps
- Personnel units
- Two Pacific 24 RHIBs

Instructors can cause a drop in speed / engine performance for Pacific 24 boats, simulating a blockage of the water jet, which requires Trainees to perform a back-flush.

Follow these steps:

1. Right-click the **Pacific 24** Editor Object.
2. In the context menu, select **Block Water Jet**.

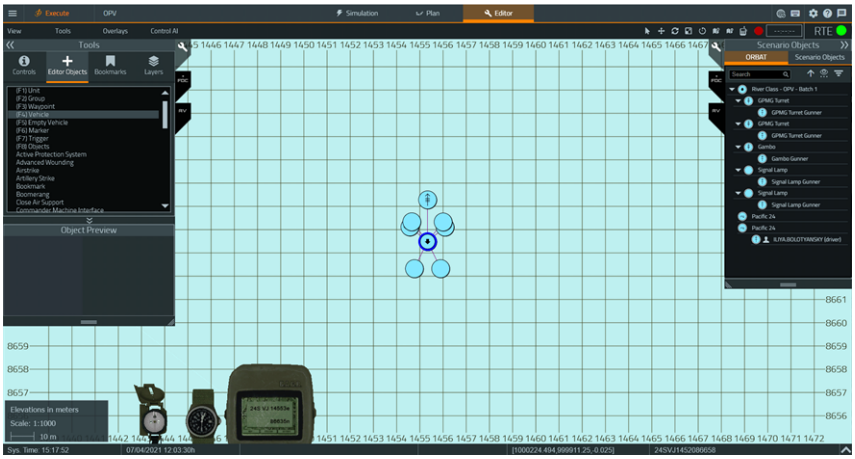
   Speed / engine performance is reduced.
3. To restore engine performance to normal levels, repeat steps 1 and 2, but this time select **Unblock Water Jet**.

Engine performance is restored.

> **NOTE**
>
> Trainees perform the back-flush by pressing the button mapped to the **User Defined 1** control by the Administrator, or pushing full forward / back using any mapped Joystick Axis. See Pacific 24 Back-Flush in the VBS4 Trainee Manual.

For more information on the River Class ship interactive elements, see OPV River Class in the VBS4 Trainee Manual.

Image-29: Execute Mode 2D view with River Class ship interactive elements



7. Event Management

During Scenario Execution, Instructors typically insert events or provide functions such as fire support.

- Fire Support (on the next page)
- VBS Call for Fire Mission Management (on page 133)

NOTE

The VBS4 Instructor Manual focuses only on specific functionality that is only available in Execute Mode.

The majority of the Prepare Mode functionality of VBS Editor and VBS Plan is also available for use in Execute Mode. For more information, see:

- VBS Editor Overview in the VBS4 Editor Manual
- VBS Plan Overview in the VBS Plan Manual

7.1 Fire Support

Administrators can request Fire Support from certain AI-controlled vehicles.

Fire Support can be provided by any ship, wheeled, tracked, or static vehicle that meets the following criteria:

- At least one weapon turret.
- An AI unit in a position with a turret.
- A primary weapon that is an area weapon, such as a machine gun, grenade launcher, or artillery.
- The vehicle must contain only AI units.

NOTE

In addition, there are the following limitations:

- The entities providing fire support cannot follow the AI Order waypoints after the fire support is completed. For more information, see One AI in the VBS4 Release Notes.
- Fire Support vehicles do not reposition in order to fire. They must be positioned so that the target is within their turret traverse limits.
- Fire support is available for helicopters, but the results are unreliable due to the typically small traverse limits on helicopter turrets.
- The AC-130 aircraft may not provide Fire Support with the desired accuracy of land-based artillery vehicles, since it is primarily designed to be used by a human-controlled weapons operator, rather than by an AI gunner and AI pilot.
- For artillery vehicles (such as mortars, howitzers, ship mounted cannons, and rocket launchers), setting a high trajectory is recommended. However, due to the small firing range on some maps, they may not be usable.

Follow these steps:

1. In Execute mode, right-click the vehicle you want to provide Fire Support, and select **Orders > Order Fire Support**.

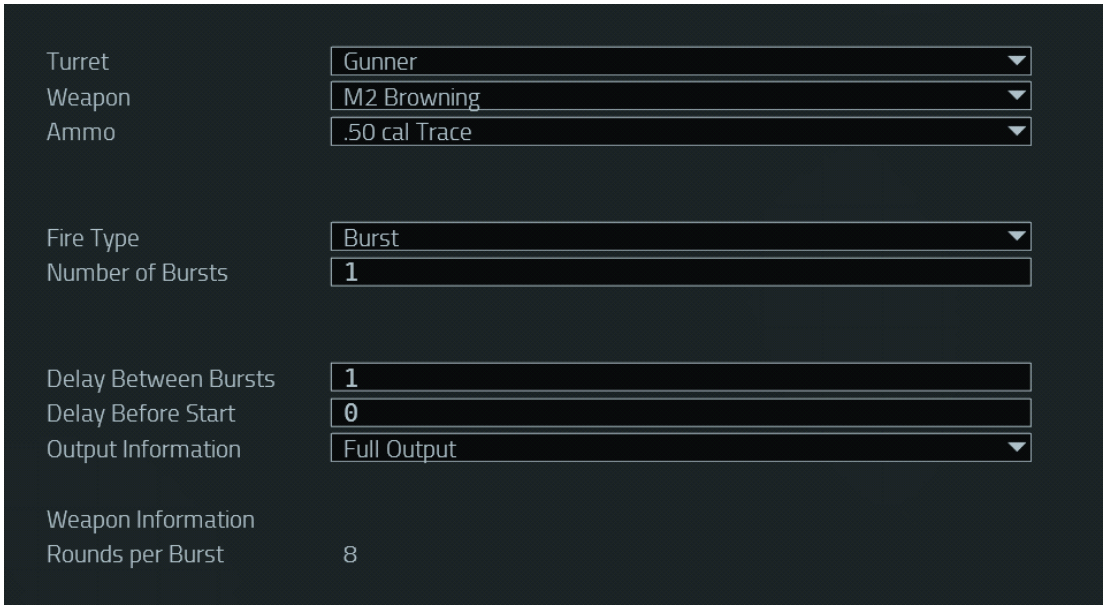
   NOTE

   If this option is not available in the context menu, the vehicle is not able to provide Fire Support.

   A black arrow appears on the map, linked from the vehicle to your cursor.

2. Click the location on the map you want the support vehicle to target.

   The Fire Support Object Properties dialog opens.



3. Input the Fire Support Settings (below).
4. Click **OK**.

VBS4 places a target icon on the map, linked to the Fire Support vehicle by a red line, and the vehicle fires either immediately or after the specified delay.

To cancel a Fire Support order, right-click the target icon, and select **Delete Object**.

Fire Support Settings

Property	Description
Turret	Select the vehicle turret to use.
Weapon	Select the weapon you want to use (depends on the turret selected).
Ammo	Select the ammunition you want to use (depends on the weapon selected). **NOTE** Illuminating rounds and smoke-airburst rounds have a default detonation height above the target.

Property	Description
Trajectory	For weapons that allow elevations greater than 45 degrees, you can select a **Default** or **High** trajectory. **NOTE** High trajectory fire takes longer to reach the target and has shorter minimum and maximum ranges, but the increased angle can hit targets that are behind terrain or buildings.
Fire Type	Select the weapon fire mode: • **Single** • **Burst** • **Automatic** The available options depend on the weapon type. **NOTE** The Weapon Information section at the bottom of the dialog updates depending on your selection.
Number of Rounds	Input how many times the weapon should fire.
Charge Weight (*N*)	When applicable, use the slider to select a charge weight (1 - *N*).
Delay Between Rounds / Bursts	Input a time delay in seconds between firing: • **Single** - This is the delay between each shot. • **Burst** - This is the time delay between the first shot of each burst. • **Automatic** - Not applicable.
Delay Before Start	Input a time delay in seconds before the first shot. The time delay starts when you click **OK**.
Output Information	Select the level of feedback sent to your side chat for the Fire Support action: • **No Output** - No messages display. • **Full Output** - Messages appear when fire support starts, for each shot / burst fired, and when fire support ends. • **Start / End** - Messages appear when fire support starts and finishes.

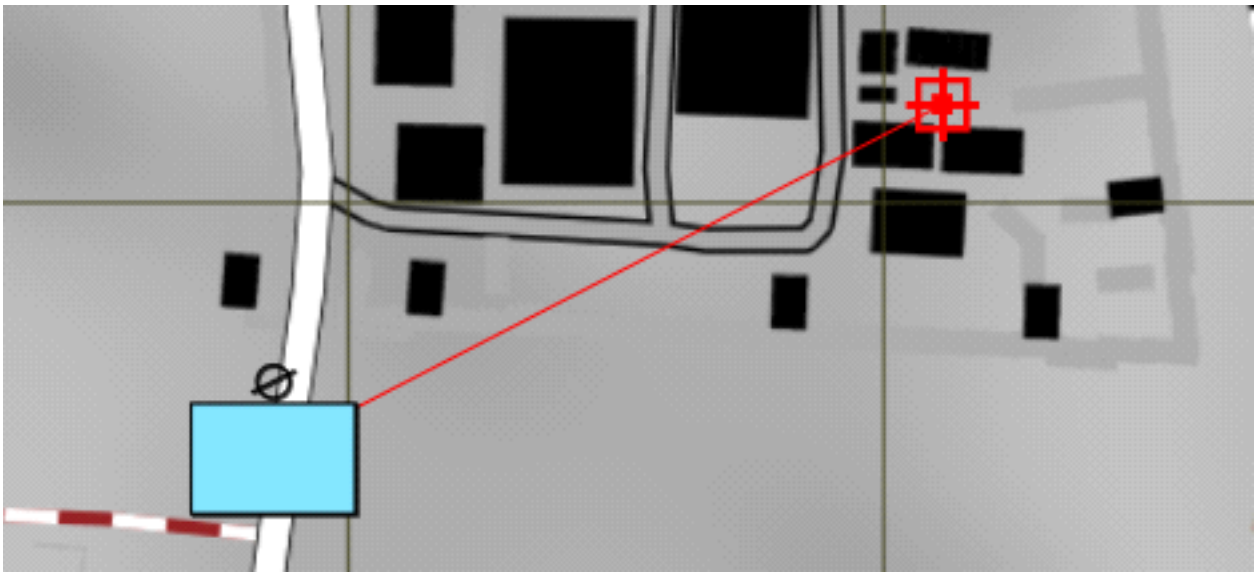
Property	Description
Weapon Information	Applies to vehicles that do not have a direct line-of-sight to the target, or are firing at elevations greater than 45 degrees to provide feedback about the validity of the configured firing solution: • **Solution** - Valid / Target is out of range. • **Estimated Time of Arrival** - Shown in seconds. • **Optimal Charge Weight** - Shown as an integer. **NOTE** This section shows only for weapons that have charge weights.

If the weapon cannot fire at the specified target (for example because of a limited firing arc or elevation), an appropriate message displays in your side chat (in Full Output and Start / End mode), and the Fire Support task is canceled.

NOTE

If you exit Execute mode before any ongoing Fire Support finishes the firing stops. If you order multi-round Fire Support you can move the target location (click and drag) between rounds, or cancel the Fire Support request.

Image-30: Fire Support vehicle linked to a target icon



In 2D map view, vehicles with a direct line-of-sight to the target have a red target icon and line. Vehicles without a direct line-of-sight to the target have a yellow line and target icon (Preparing), followed by a blue line and target icon (Firing).

7.2 VBS Call for Fire Mission Management

Fire missions are managed by the FDC Operator, using various controls found in the main Fire Direction Center and Gunlines Details panels. These controls enable the FDC Operator to create, edit, and control fire missions, and monitor gunline activity.

Follow this process:

1. Set up a fire mission, see Create a Fire Mission (below).
2. Edit / adjust a fire mission, see Active Fire Missions (on page 139).
3. Monitor gunline activity, see Gunline Data (on page 140).

WARNING

Fire mission and gunline data created in VBS Call for Fire may be backward incompatible with older versions of VBS Call for Fire in older VBS4 releases.

7.2.1 Create a Fire Mission

Before creating a fire mission, create a gunline. Gunlines are created in the **Gunline Configuration** panel. For more information, see Gunline Management in the VBS Call for Fire Manual. From the Main FDC panel, you can access the Fire Mission panel, used to create fire missions.

Image-31: Fire Mission panel

Follow these steps:

1. In the Main FDC panel, click the **BLUFOR** tab to create a fire mission for the BLUFOR side, or click the **OPFOR** tab to create a fire mission for the OPFOR side.
2. Click the **New Mission** button or **+** in the Active Missions list to open the Fire Mission panel.
3. Select an **FO** and **Mission Type**, and make a fire mission **Scheduled**, if required.

Setting	Description
FO	Use the drop-down to select a Forward Observer (FO) from the list of URN Markings or select **Enter FO Position Manually**, to enter coordinates for the FO.
Mission Type	Use the drop-down to select a mission type. See Mission Types (on page 143) for detailed descriptions of each mission type option.
Scheduled	Select to open Time on Target (below) fields to schedule a fire mission. **NOTE** Scheduled fire missions are the only type of missions that end automatically, without intervention from the FDC Operator.
Time on Target	Enter a specific time when the first round should impact the target. The fire mission automatically starts at a calculated length of time before the time you enter, which is necessary for the rounds to arrive on target and on time (the gunline procedures of Preparing, Attention, Laying, and Loading, followed by the time-in-the-air of the projectile, are taken into account). **NOTE** The Time on Target set relates to the Elapsed / Mission Time (below). How a fire mission starts can vary, depending on the **Method of Control**: • **Fire When Ready** - When the elapsed time is reached, the fire mission is added to Active Fire Missions (on page 139), and becomes active. The guns go through the configured procedures, and fire at the target. • **At My Command** - When the elapsed time is reached, the fire mission is added to Active Fire Missions (on page 139), and starts to play. However, the guns are only prepared for firing. They do not fire until the FDC Operator clicks **Fire Mission**. On fire mission completion, the mission entry in Active Fire Missions (on page 139) moves to Finished Missions.
Elapsed / Mission Time	Clock that shows the current time, depending on the time format set. For more information, see Synchronize Time in the VBS4 Editor Manual.

4. In **Supporting Gunline**, do one of the following:
   - Check the **box** next to a gunline name, to use all the guns in that gunline.
   - Check the **box** under a specific gun number, to use that gun.

> **NOTE**
> The gunlines shown are specific to the side you selected (BLUFOR / OPFOR).

5. In **Target Location**, select one of the following settings.

Setting	Description
Recorded	Select to use TRP coordinates from the Target Worksheet (see Target Management in the VBS Call for Fire Manual).
Grid	Select to enter new target coordinates, see Target Management in the VBS Call for Fire Manual.
Shift	Select to select an existing target, and adjust the position of the gun barrels in relation to the target: • **Known Position** - Use the drop-down to select existing TRP coordinates. • **Direction (mil)** - Field available if no FO is assigned to the mission. Enter an angle in milliradians, to adjust the angle between North and the target. • **Left / Right** - Select the direction to move the **target**, and enter by how much in the field (meters). If using an FO, Left / Right is from their viewpoint. • **Add / Drop** - Move the **target** further away (**Add**) or closer (**Drop**) to the FO, and enter by how much in the field (meters). Add / Drop is from the viewpoint of the FO. • **Up / Down** - Move the **target** up / down (vertical adjustment), and enter by how much (meters). This setting adds meters above or below ground level. Guns normally aim at the target at ground level. Each additional shift is calculated from the last impact position, not the first target selected for the mission. An **^** / **v** arrow appears on the map with a number indicating meters relative to the ground.
Polar	Select to calculate the grid coordinates when a target is specified by reference to the FO position: • **Direction** - Enter the direction of the target (mils), relative to the angle between the FO and North. • **Distance** - Enter the distance from the FO to the target (meters). • **Up / Down** - Select to move the target point up / down, and enter by how much (meters). **WARNING** An FO (on the previous page) must be selected for this option to be available.

6. In **Target Description**, use the drop-downs to enter specific information about the target, provided by the FO:

Setting	Description
Type	Troops, Armor, Equipment, Supply Dump, Trucks.
Size	Fire Team, Squad, Platoon, Company.
Disposition	Moving, Digging in, In an assembly area.
Degree of Protection	In open, In foxholes, In bunkers with overhead protection.

> **NOTE**
> The settings in this section have no simulation effect. They are included so that the FO can role-play reporting information about the target. The FDC Operator records information here, received from the FO, for later review. See also Role-Play (on page 147) for more information.

7. In **Distribution**, use the drop-down to select the Distribution Patterns (on page 149) you want.
8. In **Ammunition**, select from the following options:

Option	Description
Default	All guns fire the same ammunition.
Fire With	Enables you to use two types of ammunition (**Ammunition A** and **Ammunition B**), divided between the guns in **Supporting Guns** at the bottom of the Ammunition section.
Follow By	Enables you to use two types of ammunition. All guns fire **Ammunition A**, then there is a delay (defined using the **Delay** countdown timer), then all guns fire **Ammunition B**.

> **NOTE**
> **Fire With** and **Follow By** allow you optionally specify a secondary target by checking **Secondary Target** and specifying the target settings, as described in step 5.

9. Use the drop-downs to select specific ammunition and fuse types:

Setting	Description
Ammunition	Select form the list of available ammunition for the gun type.
Fuse	Select from the available fuse types for the ammunition: • **PD** - Impact fuse which triggers upon contact with a hard object. • **Timed** - Triggers after a timed interval. The time is automatically calculated depending on the Height of Burst (m), set by the FDC Operator. The **Height of Burst** setting is only shown when this fuse type is chosen. • **Near Surface** - Proximity fuse. Triggers approximately 1 meter from the ground. • **Delay** - Triggers a momentary time delay after impact. • **Proximity** - Triggers approximately 4 meters from the ground.
Rounds to be Fired	Select one of the following, and enter amounts in the corresponding fields: • **Total** - Total number of shells to be fired between all guns. • **Per Gun** - Total number of shells to be fired per gun. • **Rounds per min.** - Total number of rounds to be fired per minute. • **Duration** - Duration the guns should continue to fire, in minutes and seconds (maximum of 10 minutes).

10. In **Method of Engagement**, select the trajectory of projectiles:

Setting	Description
Trajectory	• **High** - Uses the maximum possible charge to hit the target using a high trajectory. • **Low** - Uses the minimum possible charge to hit the target using a low trajectory.
Charge Level	Leave as **Automatic**, or use the drop-down to select the amount of propellant for rounds. For example, a charge level of **1** applies a small amount of propellant producing a short range, a charge level of **5** applies a large amount of propellant producing a long range.

11. **Optional:** Use the **Adjustments** options for informational purposes.
    - **Area / Precision** - Indicates if gunners should hastily cover an area, or take care to fire with precision. AI gunners always perform their tasks with ideal accuracy. To simulate inaccuracy, use the **Dispersion** setting when you create gunlines to adjust the accuracy of the gunline, or select the Circle pattern setting to cover a broad area in (see Create Gunlines in the VBS Call for Fire Manual).
    - **Mark** - **For exercise recording only, there is no simulation effect**. If checked, the FO can confirm that illumination rounds are bursting at the desired height and location. This option is available so that the FO and FDC Operator can role-play this step by recording the volley in which the desired effect was obtained, for later review.
    - **Danger Close** - **For exercise recording only, there is no simulation effect**. Indication given by the FO that friendly troops are near the target location. AI behavior does not change based on this parameter.

    > **NOTE**
    >
    > These settings have no simulation effect. They are included so that the FO can role-play reporting information about the target. The FDC Operator selects options here based on information provided by the FO, which is used for later review. See Role-Play (on page 147) for more details.

12. In **Method of Control**, use the drop-down to select from the following settings:
    - **Fire When Ready** - The guns fire shortly after the mission starts, depending on the timing configuration of gunline events.
    - **At My Command** - The guns fire when the FDC Operator clicks **Fire Mission** during Fire Mission Verification (on page 153).
13. In **Control Type**, use the drop-down to select from the following settings:
    - Continuous Fire
    - Continuous Illum
    - Coordinated Illum

    > **NOTE**
    >
    > Control Type settings have no simulation effect on their own, see Role-Play (on page 147) for more details.

14. Click **Process**.

    The CFF system checks the following and if all conditions are met, Fire Mission Verification (on page 153) occurs, which enables you to review the settings you configured:

    - The selected guns are not being used by another fire mission.
    - The target is in range.
    - The guns have sufficient ammunition to complete the fire mission.
    - The fire rate is achievable.
    - For scheduled missions, that the required Start Time is not in the past / before mission start.

7.2.2 Active Fire Missions

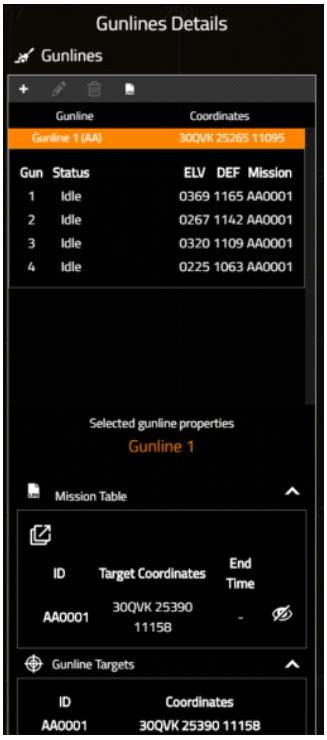
You can edit and control currently active fire missions using the buttons located at the top of the Active Missions list. Click the entry of the fire mission you want to edit / control in the list, so that it is highlighted, and the buttons are activated.

7.2.3 Gunline Data

Existing gunlines are listed as entries in the Gunlines Details panel. Once a gunline is assigned to a fire mission and the mission is started, various data is made available. This data is also saved when the fire mission is ended for later review.

> **TIP**
>
> Before fire mission start, click the **entry** of the gunline assigned to the mission, so that it is highlighted and expands. Here you can see gunline data update in real-time.

Image-32: Expanded gunline entry



Data is shown in the following columns:

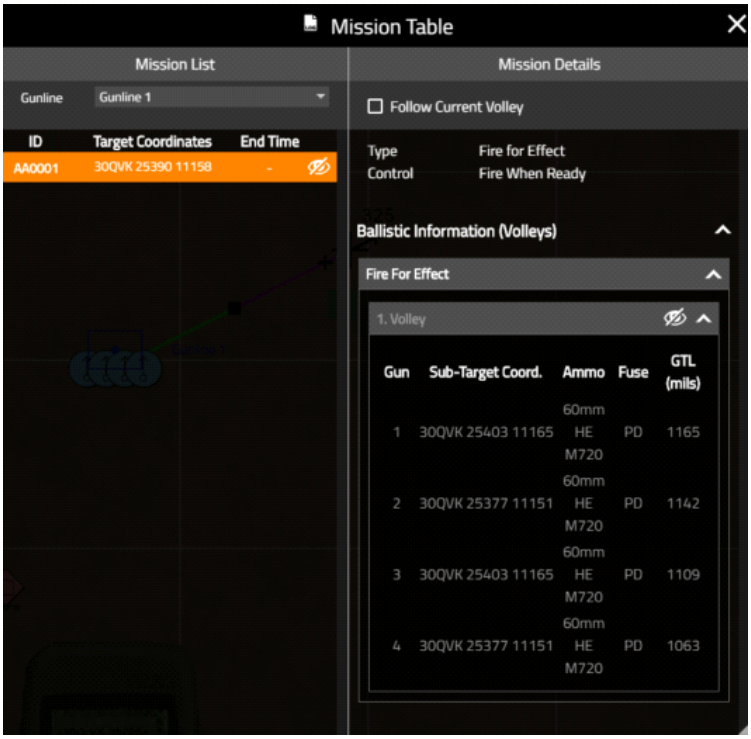
Column	Description
Gun	Numbered list of guns in the gunline.
Status	Displays the process statuses in real-time: Idle, Preparing, Attention, Laying, Loading, Fired, Unloading, Stowing.
ELV	Elevation of each gun in relation to the ground (milliradians).
DEF	Deflection, the rotation of each gun (milliradians).
Mission	ID of the fire mission the gunline is currently undertaking.

Further data is available in the tables that follow.

Mission Table

All fire missions the gunline is assigned to are listed here. Click the **expander** or **log** to open the full version of the Mission Table.

Image-33: Mission Table (full version)



The table has the following controls:

Control	Description
Gunline	Use this drop-down to select a gunline.
Follow Current Volley	Select to show the trajectories of any volleys in the air. When the fire instruction ends, the last trajectory is still visible and CFF automatically hides trajectories of volleys that have landed, unless showing the final volley.

The rest of the table is divided into the following panels:

Mission List

Lists fire missions as one line entries, with the following data:

- **ID** - Mission ID number.
- **Target Coordinates** - Coordinates of the target.

> **NOTE**
> Displays the last set of coordinates that the FDC Operator directed the guns to fire at.

- **End Time** - Time the fire mission ended.
- Show / hide trajectories for the gunline.

Click an **entry** (so that it is highlighted) to populate the Mission Details column.

Mission Details

The following data is displayed for the fire mission selected in the Mission List column:

- **Type** - Displays the Mission Type, see Mission Types (on the next page).
- **Control** - Displays gun behavior selected, see Create a Fire Mission (on page 133).
- **Ballistic Information (Volleys)** - Click the down arrows to display further data:
  - **Gun** - List of guns used for the volley.
  - **Sub-Target Coord** - Precise coordinates targeted.
  - **Ammo** - Ammunition used.
  - **Fuse** - Fuse type used.
  - **GTL (mil)** - Gun to Target Line direction in milliradians.
  - Show / hide trajectories for the individual volleys.

Click **X** to close the Mission Table.

> **NOTE**
> **Sub-Target Coordinates** are the precise coordinates a gun targeted when firing that round. They may differ from the main mission target co-ordinates, if target patterns are used, or if the rounds are from historical volleys.

Gunline Targets

This table lists the related target(s), including the mission **ID**, and the target **Coordinates**.

7.2.4 Mission Types

The following mission types are available in the Fire Direction Center UI:

Mission Type	Description
Fire for Effect	Use when you know the exact coordinates of the target. **NOTE** Adjustments cannot be made to Fire for Effect missions. Use **Adjust Fire** if you expect to make adjustments to your fire mission.
Adjust Fire	Use when receiving target coordinates from an FO. This mission type enables you to quickly adjust coordinates during the mission, if necessary. **NOTE** Each adjustment creates new Volleys of the original mission.
Immediate Smoke	Use to quickly suppress a small target location with smoke to disorientate the enemy, or to conceal BLUFORs. The behavior of this Mission Type is similar to Fire for Effect. However, the Immediate Smoke mission type is recorded in the Mission Report, and is visible in VBS Call for Fire in AAR (in the VBS4 AAR Manual). See Configure an Immediate Smoke Mission (on the next page).
Immediate Suppression	The behavior of this Mission Type is similar to Fire For Effect. However, Immediate Suppression missions are recorded in the Mission Report, and are visible in VBS Call for Fire in AAR (in the VBS4 AAR Manual). See Configure an Immediate Suppression Mission (on page 145).
Record Target	Use to create a mission target (see Target Management in the VBS Call for Fire Manual) in Execute mode during run-time. **NOTE** The target position is not marked on the map. Even though the target ID is linked to a gunline, the guns do not fire for this type of mission. The Record Target mission target can be re-used in other missions. The following fields must be filled: • **Gunline** - Select a gunline, it is not necessary to select specific guns. • **Target Location** - See Target Management in the VBS Call for Fire Manual.

Mission Type	Description
SEAD (Suppression of Enemy Air Defenses)	Use this Mission Type to enable coordination with Close Air Support. SEAD missions are based on Fire for Effect, and are "role-play", like Immediate Smoke missions. See Configure a SEAD Mission (on the next page). **NOTE** Close Air Support is not simulated as part of CFF, use the existing VBS features (see VBS Close Air Support in the VBS Close Air Support Manual and Close Air Support in the VBS4 Editor Manual). You can use the Fire Scheduling Plan and the CAS Delay Until Start to schedule the Close Air Support to begin while the SEAD mission is suppressing a target.

Configure an Immediate Smoke Mission

The following procedure explains how to configure an Immediate Smoke mission.

Follow these steps:

1. Select the **Immediate Smoke** Mission Type.
2. Set the appropriate Time on Target (on page 134).

   NOTE
   Only required in Prepare mode.

3. In **Supporting Gunline**, select the box to select the gunline.
4. In the Ammunition section:
   a. Select a smoke ammunition type.

      NOTE
      This is important as gunlines can contain multiple ammunition types.

   b. Select a fuse type, and the number of rounds.
5. In Method of Engagement, set the Trajectory to **Low**, so that the rounds arrive at the target faster.
6. In Method of Control, select **Fire When Ready**, so that the rounds are fired as soon as possible.
7. Click **Process**.

A panel opens for Fire Mission Verification (on page 153).

Configure an Immediate Suppression Mission

The following procedure explains how to configure an Immediate Suppression mission.

Follow these steps:

1. Select the **Immediate Suppression** Mission Type.
2. Set the appropriate Time on Target (on page 134).

   > **NOTE**
   > Only required in Prepare mode.

3. In **Supporting Gunline**, select the box to select the gunline.
4. Select a **target** in Target Location.
5. In the Ammunition section:
   a. Select a high explosive ammunition type.

      > **NOTE**
      > This is important as gunlines can contain multiple ammunition types.

   b. Select a fuse type, and the number of rounds.
6. In Method of Engagement, set the Trajectory to **Low**, so that the rounds arrive at the target faster.
7. In Method of Control, select **Fire When Ready**, so that the rounds are fired as soon as possible.
8. Click **Process**.

A panel opens for Fire Mission Verification (on page 153).

Configure a SEAD Mission

The following procedure explains how to configure a SEAD mission.

Follow these steps:

1. Use the Schedule Mission feature (see Fire Scheduling Plan in the VBS Call for Fire Manual) to select an appropriate **Time on Target**.
2. If an illumination marking round is required, select a second target using **Fire With**.
3. To achieve interrupted suppression times, use **Follow By** to specify a delay between fires, or you can schedule two SEAD missions (in the case that a marking round is required).
4. Click **Process**.

A panel opens for Fire Mission Verification (on page 153).

7.2.4.1 Fire Mission Control Variants

When you click **Start Mission** in the Fire Mission Verification (on page 153) panel, various button controls are made available. Which button controls are shown depends on the options you select during fire mission creation, and can include the following.

Setting	Description
Check Fire	Click to pause firing of the gunline. Click **Resume Fire** to fire the guns. **NOTE** Processes such as Preparing, Attention, Loading, Unloading, Stowing, Laying are not paused.
Fire Mission	Only available if the setting is **At My Command**.
Repeat Mission	Click to repeat the last fire instruction that was performed (assuming you have sufficient ammunition).
Adjust Mission	Available for all mission types (except **Record Target**). Click to re-open the **Fire Mission** panel, and make the following adjustments, if necessary: • Change the **FO**. • Change the **FO Position** (check **Enter FO Position Manually** and enter coordinates manually, or click the **locator**, and click the map where you want to place the FO) .  • Add / remove guns (from the same gunline). • In **Target Adjustment**, set a new target using the **Polar** targeting type (an FO position is require for this to work). • In **Target Adjustment**, set a new target using the **Shift** targeting type. • Change the **Distribution Pattern**. • Change the **Ammunition**. • Change the **Method of Engagement**. • Change the **Method of Control**.
Fire for Effect	Click to perform Fire for Effect, as the final stage of an Adjust Fire mission.

Setting	Description
End Mission	Click to end the mission. The mission ends and an entry is added to Finished Missions. **NOTE** Finished missions cannot be repeated. They are only for the purpose of VBS Call for Fire in AAR in the VBS4 AAR Manual.
Close Report	Click to close the verification panel, and return to the main FDC panel.

7.2.4.2 Role-Play

The Control Type drop-down in Method of Control (see Create a Fire Mission (on page 133)) contains the following "role-play" fire mission options:

- Continuous Fire / Continuous Illum (below) - Continuous fire / illumination mission.
- Coordinated Illum (below) - Coordinated illumination fire mission.

These are used in conjunction with the Mission Type selected at the top of the Fire Mission panel. However, selecting any of these options merely tags the fire mission as being of that role-play type. There is no effect on the actual fire mission itself. Additional steps are required to make a fire mission behave as the selected role-play type:

Continuous Fire / Continuous Illum

Follow these steps:

1. Select **HE / ILLUM** rounds in the Gunline Ammunition Loadout (see Create Gunlines in the VBS Call for Fire Manual).
2. Specify a long **Duration** setting in Rounds to be Fired (see Create a Fire Mission (on page 133)).
3. In Control Type, select **Continuous Fire / Continuous Illum**.
4. Click **Process**.

Coordinated Illum

Follow these steps:

1. Select illumination rounds in the Gunline Ammunition Loadout (see Create Gunlines in the VBS Call for Fire Manual).
2. Select the desired pattern and number of guns to achieve illumination.
3. Select **Adjust Fire** in the Mission Type drop-down (see Create a Fire Mission (on page 133)).
4. After running Adjust Fire instructions to confirm that the target is correct, select **Mark** in Method of Engagement.

5. In the next fire instruction, select **At My Command** as the Method of Control, to enable the FDC Operator to choose the time to fire the illumination rounds.
6. Use the Fire Scheduling Plan in the VBS Call for Fire Manual to coordinate the firing of the Coordinated Illumination mission with a separate FFE mission, in which the Time on Target (on page 134) is specified.
7. Click **Process**.

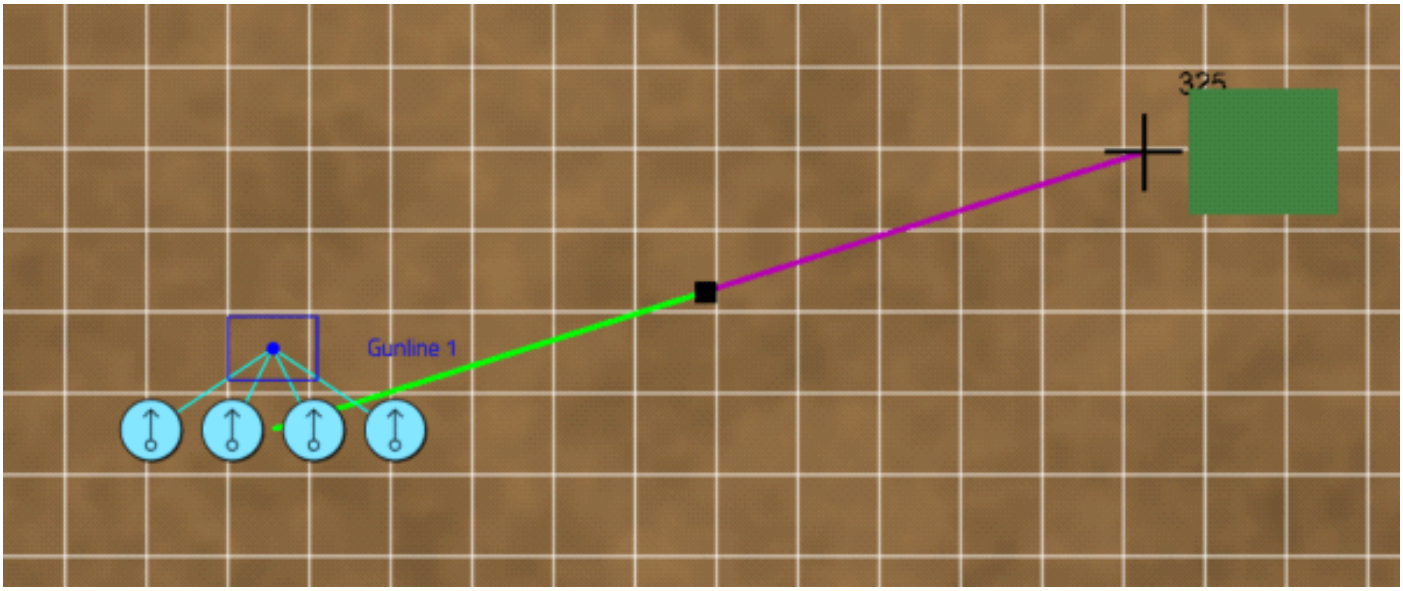
Image-34: Continuous Illumination mission

7.2.5 Distribution Patterns

This topic describes and illustrates the distribution patterns of fired rounds, configured in the Distribution section of the Fire Mission panel, see Create a Fire Mission (on page 133). The black **plus** symbols represent targets, sub-target aims, and impact points.

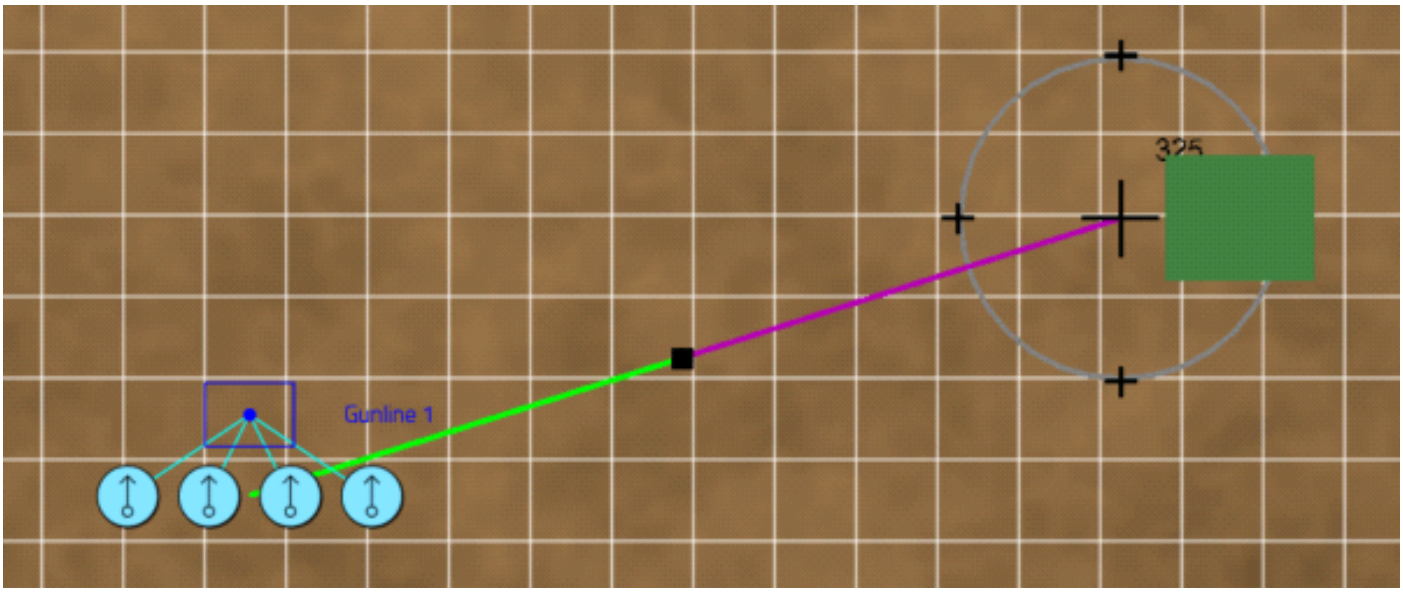
Convergence

All rounds are aimed at the same point. Terrain changes from impacting rounds, and differences in physical fuse simulation may make the exact point of impact differ slightly. There may also be a dispersion factor if the gunline was configured using the **Dispersion** option (see Create Gunlines in the VBS Call for Fire Manual).



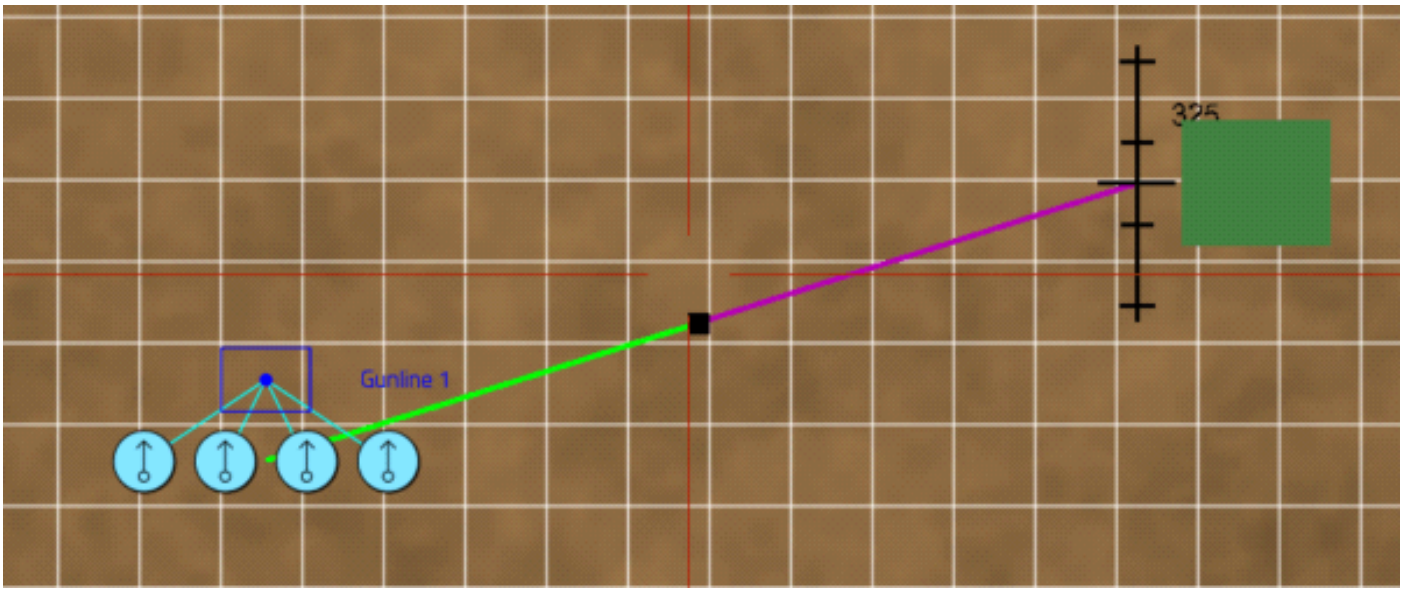
Circle

During the fire mission, all rounds impact along the perimeter of the defined circle. The FO specifies a radius, which the FDC Operator inputs into the **Radius (m)** field.



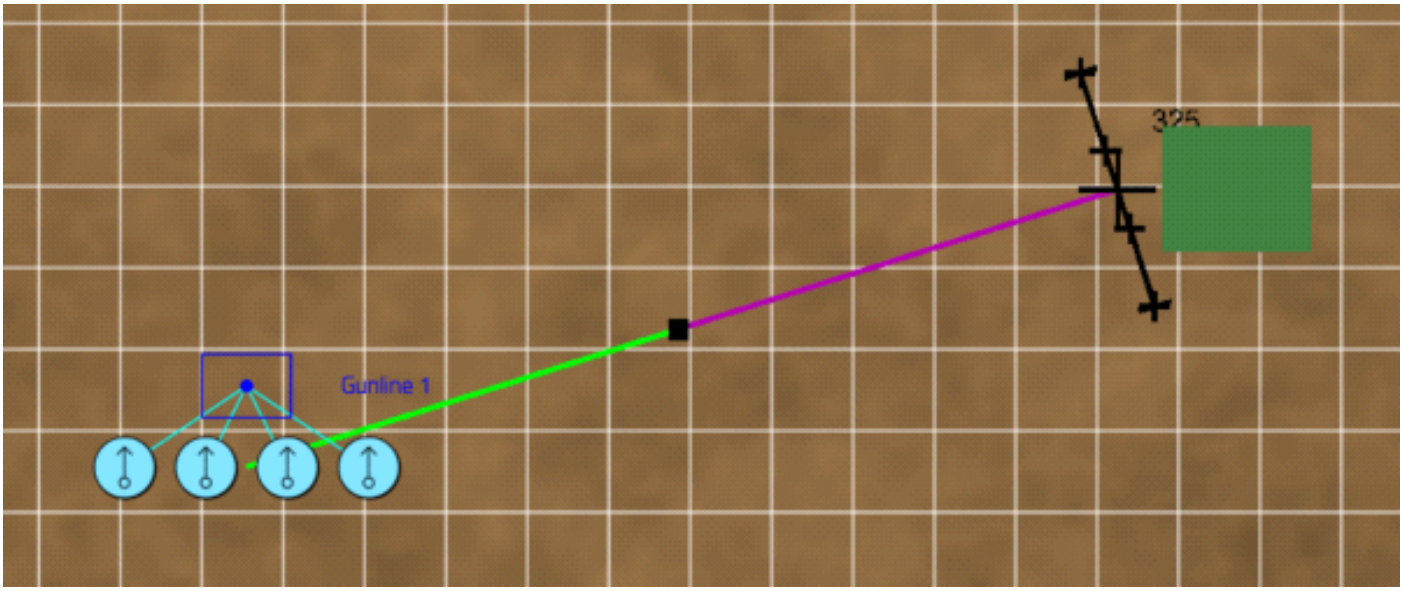
Linear

Guns fire along a line of specified length and attitude. The FDC Operator inputs this information into the **Attitude (mil)** and **Length (m)** fields. Aim / impact points are evenly spaced along the line.



Open

Guns fire along a fixed line, equal in length to the length of the gunline, and perpendicular from the guns to the target line. Aim / impact points are evenly spaced along the line.



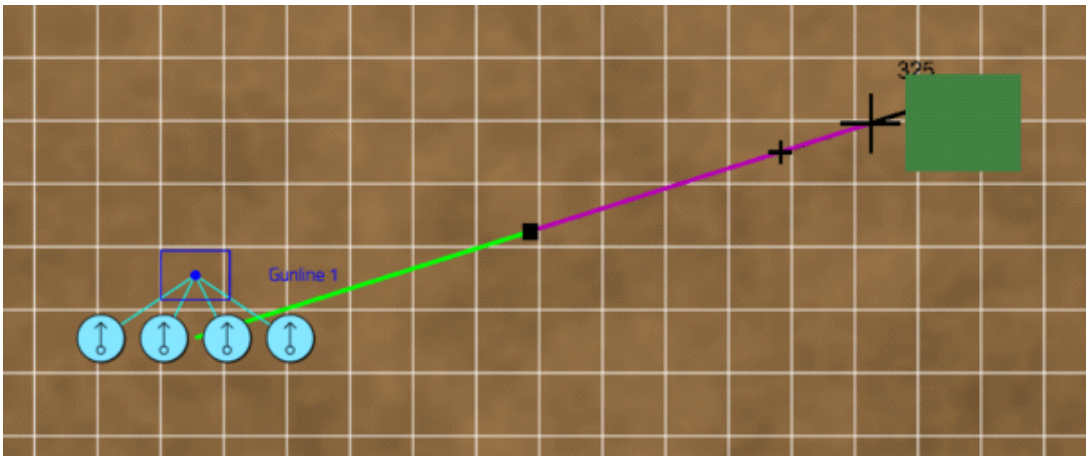
Range

This is a line pattern which is on the FO > Target line (use GTL if there is no FO), with a target at either end. When this Distribution Pattern is selected, the **Length (m)**field becomes available for you to input a length for the line, in meters.

Shots are fired alternately between the two targets. For example, in the screenshot that follows:

- Gun 1 fires at the top target.
- Gun 2 fires at the bottom target.

> **NOTE**
>
> Normally, only two guns are used with the Range distribution pattern, with shots alternating between the two guns.



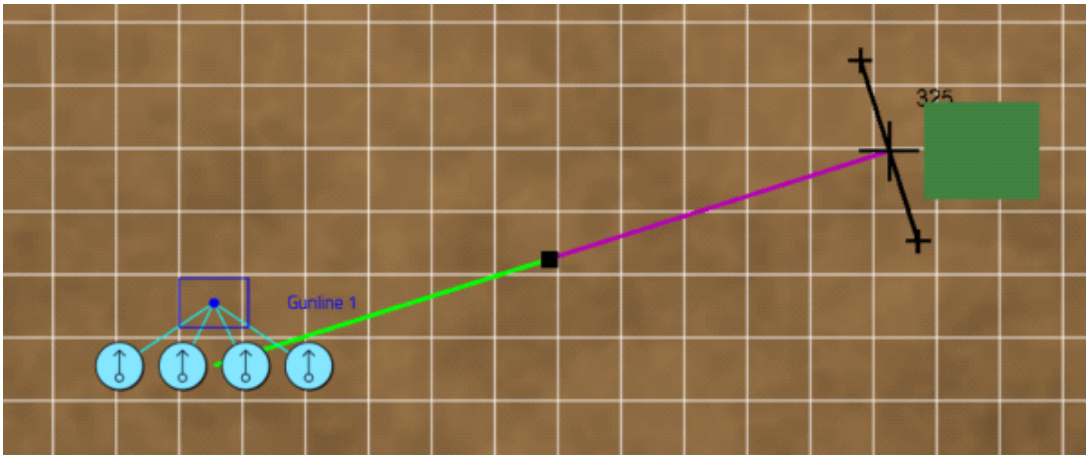
Lateral

This is a line pattern which is perpendicular to the FO > Target (use GTL if there is no FO), with a target at either end of the line. When this distribution pattern is selected, the **Length (m)** field becomes available for you to input a length for the line, in meters.

Shots are fired alternately between the targets. For example, in the screenshot that follows:

- Gun 1 fires at the left target.
- Gun 2 fires at the right target.

> **NOTE**
>
> Normally, only two guns are used with the Range distribution pattern, with shots alternating between the two guns.

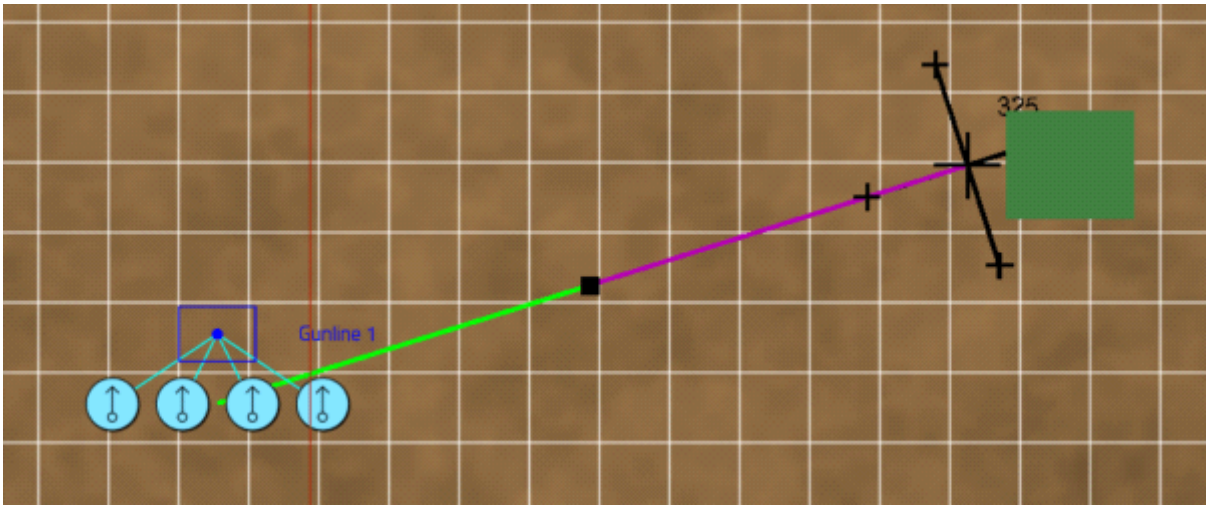


Range Lateral

This is a cross pattern combining the **Range** and **Lateral** distribution patterns, which is on the FO > Target line (use GTL if there is no FO), with four targets. When this distribution pattern is selected, the **Length (m)** field becomes available for you to input a length for the lines between opposite targets, in meters.

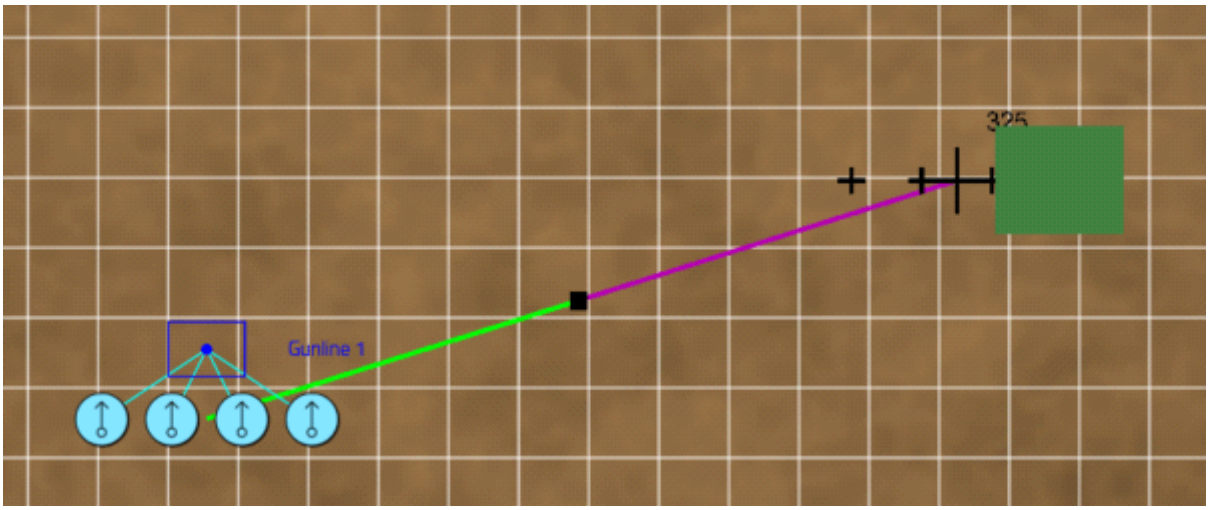
Shots are distributed alternately between the four targets. For example, in the screenshot that follows:

- Gun 1 fires at the top target.
- Gun 2 fires at the bottom target.
- Gun 3 fires at the left target.
- Gun 4 fires at the right target.



Parallel

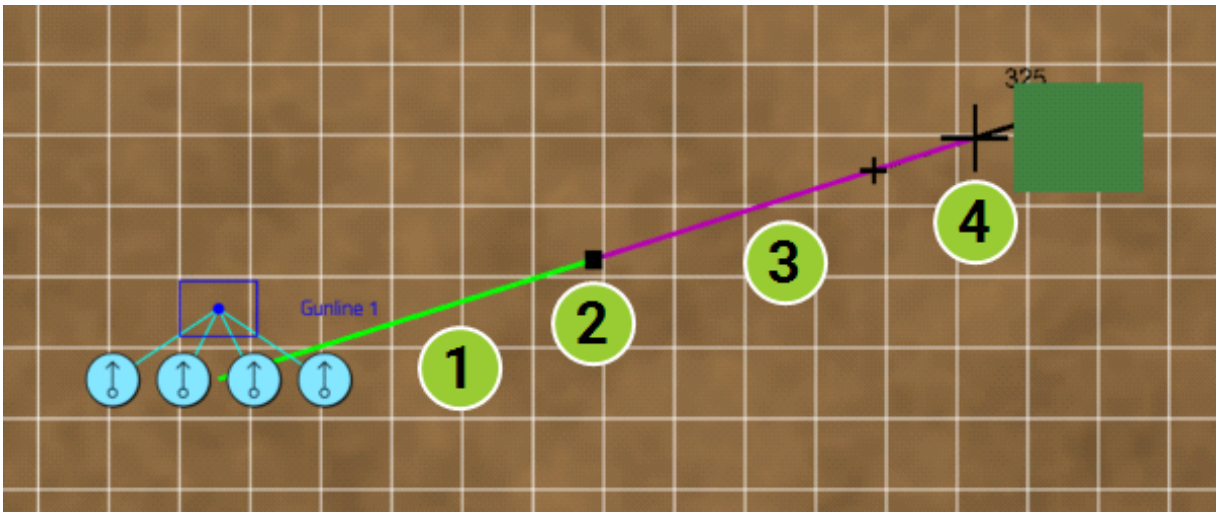
The impact points of the rounds mirror the physical layout of the guns on the ground.



7.2.6 Fire Mission Verification

When you click **Process** in the Fire Mission panel, a verification panel opens which enables you to check all your settings before starting the fire mission. The panel is similar in appearance to the Mission Report Panel (on page 155), and contains similar data. It also displays the Message to Observer (below) (MTO). If processing fails, notification is shown and you can make changes.

In addition, information similar to the following is shown on the 2D map, enabling you to see the proposed trajectory of the projectile(s):



Number	Description
1	Ascending trajectory (green line).
2	Trajectory vertex (black square).
3	Descending trajectory (purple line).
4	Point of impact (black cross).

7.2.6.1 Message to Observer

At the bottom of the verification panel is the **Message to Observer (MTO)**, that is sent to the FO to confirm firing details. The message includes the following information:

Information	Description
Units to Fire	Name of the gunline and the number of guns selected for the fire mission.
Ammunition	Ammunition that is being used for the fire mission.
Number of Rounds (per gun)	Average number of rounds, rounded down. Only Ammunition type A is shown.

Information	Description
Target	Displays one of the following: • **TRP** - Name of the TRP or Mission Target. • **SHIFT** - TRP name plus adjustments, for example: "left 500m". • **POLAR** / **GRID** / **AF** / **FFE** - Grid location.
Time of Flight(s)	Estimated time for the first round to reach the target.
Ordinate Altitude (m)	Maximum ordinate of the round, relative to the gun.
Time On Target	If applicable. Time the first round in the fire mission is scheduled to hit the target.
Danger Close	If applicable. Indicates that the FO provided information that friendly troops were near to the target location.

7.2.7 Mission Report Panel

This panel displays data about Active / Finished fire missions. Click any instance of the **information** icon in the VBS Call for Fire UI to open the Mission Report panel.

Go to one of the following lists, and click a **fire mission** entry, so that it is highlighted:

- Active Missions (see Active Missions in the VBS Call for Fire Manual).
- Finished Missions (see Finished Missions in the VBS Call for Fire Manual).

Open the **Mission Report** panel. The panel contains the information listed in the following tables.

Parameter	Description
Mission ID	ID of the fire mission.
FO	URN Marking of the Forward Observer (FO) unit.
Supporting Gunline	Name of the gunline that is assigned to the mission.
Current Volley	Displays the current volley number. Refers to either the last volley that the gunline fired, or the volley it is currently firing. Click **Highlight** to show the data for the current volley in the Ballistic Information (Volleys) section.

Parameter	Description
Follow Current Volley Trajectories	If selected, shows the trajectories of any volleys in the air. When the fire instruction ends, the last trajectory is still visible and CFF automatically hides trajectories of volleys that have landed, unless showing the final volley.
Rounds Fired	Shows the number of rounds fired. Defaults to 0 if the fire mission has not started.
Total Rounds	Shows the total of all the rounds fired, or planned as part of the mission.
Type	FO role-play information. Target type reported, such as troops, vehicles, or equipment, for example.
Size	FO role-play information. Size of target reported (formation of the target group if it consists of troops).
Disposition	FO role-play information. Actions performed by the target group at the time of attack.
Degree of Protection	FO role-play information. If the target individuals were under cover or out in the open.
Area / Precision	FO role-play information. Indicates if gunners hastily covered an Area, or took care to fire with Precision.
Danger Close	FO role-play information. If selected, the FO provided information that friendly troops were near to the target location.

Ballistic Information (Volleys)

Parameter	Description
Impact Coordinates	Shows the grid coordinates that the guns were aimed at.
Impact Elevation (m)	Shows the elevation of the target, relative to the ground.
Distribution Pattern	Shows the distribution pattern you selected for the fire mission. Any parameters that were added for the distribution pattern (such as length, attitude) are also displayed.
Mark	FO role-play information. If selected, the FO was able to confirm that illumination rounds were bursting at the desired height and location.
Trajectory	Trajectory used (High / Low).

Volley

Parameter	Description
	Click to show / hide the trajectory for the current volley. Trajectories are shown as linear paths, which approximate the ballistic curve of the trajectory.
Maximum Ordinate	Shows the highest point reached by a round, relative to the height of the gun, visualized by a black square on the 2D map.
Angle T (mils)	Angle of trajectory in milliradians. Only appears when there is a Forward Observer (FO) unit in the fire mission.
Gun	Gun number in the gunline.
GTL (mils)	Gun-to-Target Line direction, in milliradians.
RNG (m)	Range (horizontal distance) the round traveled to the target.
Ammo	Ammunition used.
Fuse	Fuse used.
TOF (s)	Shows the actual / predicted time of the flight, which counts down when the round is in the air (in seconds).

Click **Close Report** to close the Mission Report panel, and return to the main FDC panel.

8. Entity Management

During Scenario Execution, the Instructor can use the Editor to directly affect the status of entities in the Scenario.

In the 2D Map, 3D Camera Views, or Scenario Objects Panel, right-click an entity or object to view a set of context actions to change its status. The available actions vary depending on the entity or object type:

- Generic Management Actions (below)
- Group Management Actions (on page 161)
- Unit Management Actions (on page 161)
- Vehicle Management Actions (on page 163)
- Waypoint Management Actions (on page 165)

NOTE

Many Editor Objects have additional context actions. For more information, see the specific topics for those Editor Objects in the VBS4 Editor Manual.

8.1 Generic Management Actions

Right-click an entity or object and select from the following actions:

Action	Description
Edit Object	Opens the Object Properties dialog for the entity / object to enable editing.
Delete Object	Deletes the entity / object from the map.
Snap to Surface	Fixes the entity / object to the surface below it. Useful when placing objects inside buildings or on ship decks, for example.
Add to Favorites / More... > Add to Favorites	Adds units, vehicles, or placeable objects to your Favorites list. For more information, see Adding Units, Adding Vehicles, and Unit and Vehicle Editor Object Filters in the VBS4 Editor Manual.
Browse Config / More... Browse Config	Select this option to open the configuration file for the entity. For more information, see Configuration Browser in the VBS Developer Reference.

Action	Description
Trigger Weapon Stoppage / Clear Weapon Stoppages	Jams the trigger of the weapon the unit is using (including vehicle tripod-mounted machine guns), so that it cannot be fired. Units with Weapon Stoppage applied display a gray pistol icon above their character in the scenario. The pistol icon changes to **red** when the unit becomes aware that their weapon cannot be fired.  In addition, a gray pistol icon is displayed next to the name of the unit Weapon Stoppage is applied to in the Scenario Objects Panel, which turns **red** when the unit is aware Weapon Stoppage has been applied to their weapon.  To clear Weapon Stoppage, do one of the following: • Open the context menu and select **Clear Weapons Stoppages** (clears Weapon Stoppage for all of the weapons the unit is using). • In the Scenario Objects Panel, right-click the name of the unit, and click **Clear Weapon Stoppages** in the context menu. • As a Player unit, press **Reload** (**R**) (see Weapon Stoppage in the VBS4 Trainee Manual). **WARNING** Weapon Stoppages applied before Recording Scenarios for AAR (on page 51) are not registered. Therefore, they must be applied after recording starts.
More... > Unit Symbol Configuration	Use to configure entity marker symbology. For more information, see Customizable Symbology in the VBS4 Editor Manual.

Action	Description
GPS Positioning / More... > GPS Positioning	Opens the GPS Coordinate Settings dialog for the entity / object, see Editor Object Positioning in the VBS4 Editor Manual.
Lower Target at Mission Start	Sets a Training Target to the lowered position at mission start. For more information, see Training Targets in the VBS4 Editor Manual.
Lower / Raise Target	Lowers / raises a Training Target during a mission. For more information, see Training Targets in the VBS4 Editor Manual. **TIP** These actions can also be performed using script command fn_vbs_setPopupTargetsState (https://sqf.bisimulations.com/display/SQF/fn_vbs_setPopupTargetsState).
Move Selected to Layer / More... > Move Selected to Layer	Moves the entity / object to another layer, see Layers and Overlays in the VBS4 Editor Manual.
Attach to ... / More... > Attach to ...	Attaches the entity / object to the following: • **Higher Echelon**, see Linking Objects in the VBS4 Editor Manual. • **Object**, see Attaching Objects in the VBS4 Editor Manual. • **Trigger**, see Trigger Linking in the VBS4 Editor Manual.
Above Ground On / Off	Available for (F8) Objects only. When set to **OFF**, the object can be moved below ground level.
Lock Position	Locks objects to the ground. Useful for fixing buildings in position, for example.
Reset Rotation / Interventions > Reset Rotation	Resets any manual rotation that was applied to an object / vehicle.
Clear CBRN Contamination	Instantly decontaminates entities contaminated by a CBRN substance, providing that they are moved away from a Hazardous Area.

NOTE

Not all the actions are applicable to all entity / object types.

8.2 Group Management Actions

Right-click a Unit / Vehicle / Group and select from the following additional actions to manage Groups:

Action	Description
More... > Export as ORBAT	Exports the group ORBAT to the ORBAT Editor (see ORBAT Editor in the VBS4 Editor Manual).
Orders > Group With	Adds the unit or vehicle to a group, see Creating and Adding to Groups with Links in the VBS4 Editor Manual.
Orders > Break Formation / Return to Formation	Breaks / reinstates the formation defined in the Object Properties dialog).
Orders > Group / Ungroup Selected	Removes a selected unit or vehicle from a group.
Orders > Make Group Leader	Makes the unit / vehicle the leader of a group.
Orders > Assign New Waypoint / Assign Existing Waypoint	Assigns a new or existing waypoint for the unit / vehicle, see Waypoints in the VBS Control AI Manual.
Interventions > Reset Formation	Resets the group formation to the original one. For more information, see ORBAT Formations Editor in the VBS4 Editor Manual.

8.3 Unit Management Actions

Right-click a Unit and select from the following additional actions:

Action	Description
Interventions > Clear Fatigue	Resets the fatigue level of the unit to 0%. Can be used at any time.
Wound Unit	Wounds the unit, so that it limps.
Kill Unit	Kills the unit.
Heal Unit	Heals the unit, so that it walks normally.
Revive Unit	Revives the dead unit, see Advanced Unit Settings in the VBS4 Editor Manual.
Interventions > Clear Disorienting Effects	Removes disorienting effects, such as dizziness.

Action	Description
More... > Edit Current Loadout	Use to quickly edit the loadout of the unit (for example, to add more ammunition), see Edit Equipment Loadout in the VBS4 Editor Manual. **NOTE** This only modifies the loadout for the duration of the current mission run-time.
Suspend User Input	Disables individual Trainee input, locking them out of unit control. Select **Enable User Input** to resume Trainee control. **NOTE** This functionality cannot disable other administrators. AI units continue to operate and Trainees may still take damage while suspended.
Camera Views > Player Camera	Switches to the view of the unit, see Player Camera (on page 57).
Camera Views > Bullet Camera	Switches to a camera view that follows any projectiles fired by the unit, see Bullet Camera (on page 58).
Visualizations > Toggle Trails On / Off	Shows recent paths of the unit, see Trail Visualization (on page 69).
Visualizations > Show Unit's FOV	Shows the Field of View of the unit, see Field of View Visualization (on page 63).
Visualizations > Show Unit's Ink-Spot / Show Vehicle's Ink-Spot	Enables you to see the lack of activity of a unit / vehicle, see Ink-Spot Visualization (on page 65).
Default Camera	Switches to the 3D Camera View at the location of the unit, see Default Camera (on page 57).
Lock Camera	Switches to a camera view of the selected unit, see Lock Camera (on page 57).
Switch to Unit	Instantly enables you to take control of the unit. **WARNING** For Group Symbols on the map this option switches to the lead unit of the group. Using this option may produce specific issues with RWS vehicles. Instead, select the specific vehicle required in the Scenario Objects Panel and use the **Switch to Vehicle** option.

> **NOTE**
>
> Not all the actions are applicable to all unit types (there may be differences between Player and Control AI units).

8.4 Vehicle Management Actions

Right-click a Vehicle in the 2D Map or 3D Camera Views to see the following additional actions:

Action	Description
Deploy / Stow Mortar	Use to deploy / stow mortars remotely on Mortar Carrier vehicles (in Prepare Mode, the actions are **Deploy / Stow Mortar at Mission Start**). Access these options by right-clicking the vehicle entry in the Scenario Objects Panel. See also: Mortar Carrier Control in the VBS4 Trainee Manual.
Orders > Tow / Hitch to Vehicle	Enables you to instantly hitch / attach the vehicle to another vehicle for towing.
Camera Views > View Optics	Switch to vehicle optics. Usually available for ships and AVs.
Interventions > Toggle All Animations	Opens / closes all animations on the vehicle at the same time. A feature of the Interact with Animations (IWA) system, see Vehicle Machinery in the VBS4 Trainee Manual.
Interventions > Animate Object	Accesses the Interact with Animations (IWA) system for the vehicle, see Vehicle Machinery in the VBS4 Trainee Manual.
Damage Vehicle	Applies damage to the vehicle, making it difficult to drive. Damage to the vehicle body is also apparent.
Repair Vehicle	Repairs destroyed vehicles.
Destroy Vehicle	Destroys the vehicle.
Interventions > Restrict Access	Restrict access to certain vehicle positions by locking them. A locked position is not accessible to Trainees. 1. Right-click the vehicle and select **Interventions > Restrict Access**. 2. Click a vehicle position to lock / unlock it. The position is now locked / unlocked.
Interventions > Kill Occupants	Kills the occupants of the vehicle.

Action	Description
Interventions > Revive Units in Vehicle	Revives all dead units in a vehicle using the Interact with Vehicles Interface (IWV) in the VBS4 Trainee Manual.
Interventions > Revive All Units	Revives all dead units in a vehicle.
Interventions > Eject All Dead Units	Removes all dead units from the vehicle.
Camera Views > Nose Camera	Switches the camera view to the "nose" of the vehicle, see Nose Camera (on page 58).
Switch to Vehicle (Advanced)	Opens the Interact with Vehicles Interface (IWV) that allows you to switch to a specific vehicle position. For more information, see Interact with Vehicles Interface (IWV). in the VBS4 Trainee Manual.
Orders > Order Fire Support	Click to request Fire Support , see Fire Support (on page 129).
Orders > Set Arcs	Click to set a Gunner Arc, see Gunner Arcs in the VBS4 Editor Manual.
Orders > Clear Arcs	Click to clear a Gunner Arc, see Gunner Arcs in the VBS4 Editor Manual.
Orders > Set IFF Parameters	Opens the IFF Parameters dialog, see IFF Codes in the VBS4 Editor Manual.
Restrict Access	Control AI command, see Activity Editor Object in the VBS Control AI Manual.
Camera Views > Switch to Crew Optics	Switches to the optics view of a vehicle crew member, see Switch to Crew Optics (on page 58).
Camera Views > Gun Camera	Switches to the optics view of the primary weapon, see Gun Camera (on page 58).
Visualizations > Show Crew's FOV	Shows the Field of View of the vehicle crew, see Field of View Visualization (on page 63).
Suspend / Enable User Input	Disables individual Trainee input, locking them out of vehicle control. Select **Enable User Input** to resume Trainee control. **NOTE** This functionality cannot disable other administrators. AI units continue to operate and Trainees may still take damage while suspended.

Action	Description
More... > Marker Lights Turn On / Off	Switches aircraft Covert Marker Lights On / Off. Default is Off.  **NOTE** This action is only available for aircraft that are empty, player controlled, or externally controlled AI (CAS / DIS).
More... > Marker Lights Switch To Day / NV	Switches aircraft Covert Markers Lights between Daylight / Night Vision. Default is Daylight. **NOTE** This action is only available for aircraft that are empty, player controlled, or externally controlled AI (CAS / DIS).

8.5 Waypoint Management Actions

Right-click a Unit or Vehicle to provide an order related to waypoints.

Action	Description
Orders > Assign New Waypoint	Submit an order to a unit or vehicle to use a new waypoint. For more information, see Waypoints in the VBS Control AI Manual.
Orders > Assign Existing Waypoint	Submit an order to a unit or vehicle to use an existing waypoint. For more information, see Waypoints in the VBS Control AI Manual.

Right-click a Waypoint to extend or modify waypoints.

Action	Description
Assign Next Waypoint	Create a chain of waypoints by specifying an existing waypoint.
Link to...	Link the waypoint to another object, for example, a vehicle.