# Introduction to VBS4

VBS4 23.2.0

Bohemia Interactive SIMULATIONS

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The Bohemia Interactive Simulations Support page can be found at:

- http://www.bisimulations.com/support

For any type of assistance with Bohemia Interactive Simulations products, use the following support email and we will respond to your query with urgency.

- support@bisimulations.com

Our website contains a range of media and handouts relating to Bohemia Interactive Simulations products:

- http://www.bisimulations.com/

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

# Contents



# 1. VBS4 - Whole-Earth Battlespace

VBS4 is an easy-to-use, whole-earth virtual and constructive simulation. In addition to supporting all VBS3 training use-cases, VBS4 can support new higher echelon use cases up to battalion level.

Compared to VBS3, VBS4 delivers efficiencies and ease-of-use improvements, reducing the need for simulation-specific knowledge in terrain and scenario generation. VBS4 is designed for non-engineers, with new tools for terrain development and mission planning that are usable by anyone. VBS4 also comes pre-loaded with a global database which gives instant access to high detail, simulated terrain anywhere on planet Earth.

**WARNING**

VBS4 22.2 included significant backwards incompatible changes to Vegetation and Building Texture paths.

If you are upgrading from a version older than 22.2, review Vegetation and Texture Repathing in the VBS4 Release Notes, and apply the necessary changes to your Insets and Battlespaces before using VBS4.

**Image-1: VBS4, showcasing high-fidelity graphics and real-time deformable terrain.**

VBS4 includes a military-specific rendering engine, procedurally enhanced terrain ingestion pipeline and an entirely new workflow including two new scenario design modes - VBS Plan and VBS Geo. VBS Plan and VBS Geo dramatically increase the speed of scenario creation and terrain creation / modification. The powerful and flexible VBS Editor (with Offline Prepare and Real-Time Execute modes) continues in VBS4 (for continuity with VBS3 and because it offers deeper scenario editing). By using VBS4, your virtual training capability will be enhanced by:

- **Scalability**

  Unlike VBS3, VBS4 supports up to two thousand high-fidelity constructive (AI) civilian and military entities in the same Battlespace (assuming you are using VBS4 Simulation Clients and a VBS4 Dedicated Server).

- **Terrain Agility**

  Execute scenarios anywhere in the world within a high-fidelity, procedurally generated whole-world database out of the box. Enhance the existing Whole-Earth base terrain with the new and intuitive VBS Geo or generate new high-fidelity insets rapidly which, using traditional methods (including terrain development in VBS3), would require terrain experts. VBS3 terrains can be imported into VBS4, and are seamlessly meshed into VBS4's procedurally enhanced global dataset.

  **Image-2: VBS4 offers an unprecedented level of realism and detail in a *procedural* Whole-Earth dataset**

- **Improved Classroom Efficiency**

  The revolutionary VBS Plan mode in VBS4 enables non-engineers to rapidly generate complex scenarios (and engineers / experts to do so much faster). VBS4 starts up in under 15 seconds (3x times faster than VBS3) and, with VBS World Server, data is managed and stored centrally, massively reducing the administrative burden of large classroom set-ups. VBS Plan, VBS Geo, and the overall improved design of user interfaces in VBS4 offer users easy access to the vast capability of VBS4. VBS4 frees up instructor time by greatly increasing the speed that training content can be generated.

- **Greater Immersion**

  Industry-leading graphical fidelity with a new environmental lighting model, dense global vegetation with multiple canopies, infinite draw distances, advanced atmospherics, and physically based shaders, produce a truly realistic, cluttered and immersive training experience for increased trainee buy-in.

- **Superior Extended Reality (XR) Support**

  Pre-built connections to XR industry standard APIs and pre-tested for use with almost all VR and MR devices available, VBS4 and VBS Blue IG enable numerous XR use cases to quickly and cost efficiently realize next generation training systems and concepts. VBS Blue IG is a companion product to VBS4 and is described in the VBS Blue IG Manual.

VBS4 is also a highly capable simulation host that can integrate with VBS Blue IG or any other compliant image generator. VBS4 can drive multiple IG channels as a high-fidelity simulation host to tap into the comprehensive capabilities for simulator use.

Connecting VBS4 to VBS Blue IG is straightforward and a range of display types are supported, from multi-channel domes to VR head-mounted displays. VBS4 can be run as a *headless host* not only with VBS Blue IG but with any compliant image generator. See VBS Host Overview (on page 140) for more information.

For further information on the full capabilities of VBS4 as a simulation host and how it may be applied to a specific integrator use case, please contact sales@bisimulations.com.

## 1.1 Train Anywhere on the Earth

A significant new feature in VBS4 is the introduction of the VBS World Server hosting the Whole-Earth Terrain. The Whole-Earth Terrain uses a Global Dataset to create an accurate virtual Earth to support training at any location on the globe.

VBS World Server is included with VBS4, and provides Whole-Earth building and road data from OpenStreetMap (OSM), accurate heights and forest coverage, and correct biomes for every region on Earth used to procedurally enhance the base data.

The Whole-Earth capability dramatically reduces terrain development time and the terrain server capability saves administration overhead by centralizing terrain data.

VBS World Server hosts the Whole-Earth Terrain and serves it to all connected Clients during a Scenario Execution (on page 89). VBS World Server is optional, and both VBS4 and VBS Blue IG support local terrain data storage in addition to VBS World Server.

## 1.2 Next Generation VBS Control AI

Bohemia Interactive Simulations aims to reduce human intervention in simulation exercises through the use of a deterministic and doctrinal VBS Control AI that is fully integrated with VBS4 and the new mission planning component, VBS Plan.

In VBS4 both Game AI and Control AI are available by default, while Control AI is the AI type used by VBS Plan.

Control AI uses Control AI Waypoints (see the VBS4 Editor Manual), and has advantages over Game AI in the following capabilities:

| Capabilities | AI Sub-Type | Additional Aspects |
|---|---|---|
| Convoy Training, Driver Training, Enemy Ambush, OPFOR Tactics, or any vehicle focused capabilities.<br>For more information on convoy capabilities, see Convoys (on page 161). | Convoy AI (see the VBS4 Editor Manual) | The Control AI convoy has the following additional aspects:<br>• The convoy has behavior that can be paused / continued.<br>• The convoy has a leader, which is dynamically selectable and can be replaced.<br>• The convoy dynamically determines the order of convoy succession, based on the convoy vehicle placement.<br>• The convoy can drive both on and off the road.<br>• The convoy reactions to enemy contact or fire can be set. |
| Enemy Ambush, OPFOR Tactics.<br>For more information on these capabilities, see Enemy Ambush (on page 173). | AI on Rails (see the VBS4 Editor Manual) | • Fine-tune enemy placement to prepare an ambush.<br>• Use Triggers to create dynamic situations.<br>• Branch Control AI Waypoints to achieve different outcomes on each Scenario run. |
| Dry Support Bridge (DSB) Training.<br>For more information about DSB laying capabilities, see HX45M Bridge Laying (Land 155) (on page 257). | Bridge Laying Convoy AI (see the VBS4 Editor Manual) | • Place DSBs of varying lengths at the required places on the terrain. |

| Capabilities | AI Sub-Type | Additional Aspects |
|---|---|---|
| Large-scale battles with a primary focus on fighting and maneuvers. | VBS Plan (see VBS Plan Overview in the VBS Plan Manual) | • Place large amounts of military entities easily, using VBS Plan.<br>• Have the entities maneuver and attack the enemy on their way.<br>• Place tanks or mechanized platoons. |
| Military infantry and vehicle fighting and maneuvers. | Military AI (see the VBS4 Editor Manual) | • Have infantry and vehicle AI perform general-purpose military orders. |
| Civilian pattern of life. | Civilian AI(see the VBS4 Editor Manual) | • Create a civilian pattern of life that consists of pedestrians and vehicles.<br>• Create various activities for pedestrians. |
| Animal-herd behaviors. | Animal AI(see the VBS4 Editor Manual) | • Add animal-herd movement. |

For more information about VBS Control AI, see VBS Control AI Overview (on page 135).

## 1.3 Everything from VBS3 and More!

VBS4 includes all VBS3 capabilities and supports all VBS3 use cases.*

- VBS3 OME and RTE are included with VBS4 - renamed simply to VBS Editor.
- Industry standard format static and moving 3D models can be imported into VBS4 using Model Exchanger.

  For more information, see Model Exchanger in the VBS Developer Reference.
- VBS3 terrains and missions can be imported into VBS4.
- VBS Simulation SDK plug-ins from VBS3 work in VBS4.
- The VBS scripting language SQF is available in VBS4.

**FEATURE NOTICE**

* The vast majority of VBS3 capabilities are included in VBS4 and the remaining capabilities are intended to be included in future releases or replaced by alternate new functionality.

For more information, see Differences from VBS3 (on page 22).

## 1.4 Powerful Tools to Customize VBS4

The VBS Simulation SDK includes a library of APIs and source code allowing developers to customize virtually every aspect of VBS4 and produce custom applications. The APIs form a modular, C plug-in architecture that enable developers to integrate third-party technologies effectively and efficiently.

For more information, see VBS Simulation SDK (on page 155) and the VBS Simulation SDK Manuals.

# 2. The VBS4 Workflow

VBS4 introduces a fresh, new main-menu user interface and user experience by presenting users immediately with a view of the globe, offering the list of available Battlespaces and the ability to create new ones anywhere on the planet.

For more information, see VBS4 UI Overview (on page 33).

**Image-3: The VBS4 User Interface**


A *Battlespace* consists of terrain edits and a scenario (which can incorporate one or more plans). With VBS World Server, Battlespaces can be stored centrally and made accessible to all connected VBS4 Clients. The comprehensive VBS4 After Action Review (AAR) provides recording and playback capability of networking (multiplayer) missions. In VBS4, the AAR user interface has been updated to be easier to use, and AARs are also stored with their respective Battlespaces.

For more information, see Battlespace Management (on page 57).

A toolbar along the top of the screen provides ready access to points of interest, options, documentation, and a notification system.

For more information, see VBS4 Toolbar (on page 35).

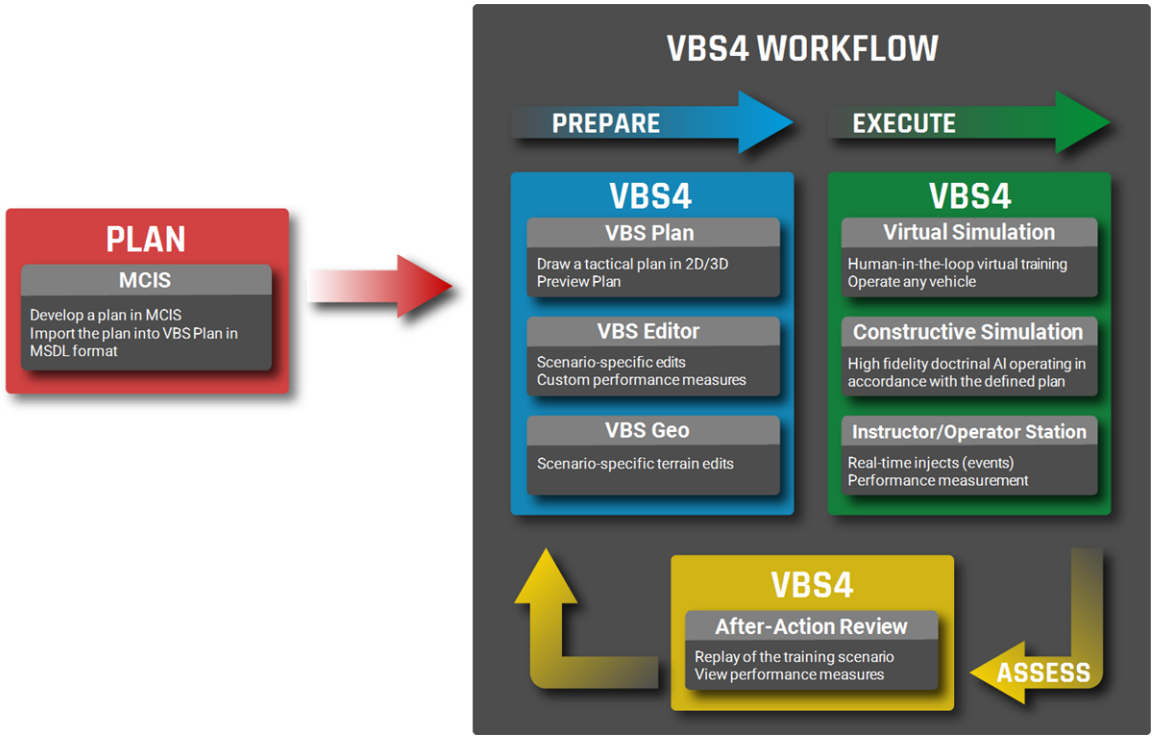
A new and optimized workflow has been implemented to enable easy and efficient creation and execution of virtual training content. The initial (optional) **Plan** phase is typically conducted in real-world systems, such as the Mission Command Information System (MCIS) meaning planners *train as they fight*.

Users conduct the **Prepare - Execute - Assess** phases within VBS4 (optionally importing the plan from MCIS into VBS Plan as a starting point).

> **FEATURE NOTICE**
>
> The MCIS Import feature is not available by default in VBS Plan in the VBS4 baseline releases. For more information, contact sales@bisimulations.com.

The **Prepare** phase of the VBS4 workflow allows the user to *quick-switch* between VBS Geo, VBS Plan, and VBS Editor modes. This means scenarios are rapidly created by building and editing the terrain and the scenario, iterating between the three modes as needed. Terrain and scenario editing can be conducted in either 2D or 3D.

**Image-4: The VBS4 workflow**



# 2.1 VBS Geo – WYSIWYG Terrain Editing

VBS Geo is an easy-to-use *What You See Is What You Get* (WYSIWYG) terrain editor fully integrated within VBS4. VBS Geo allows users to intuitively and rapidly modify, extend, and replace environmental features of the whole-Earth database without leaving the VBS4 application.

This empowers users with the ability to enhance the out-of-the-box terrain using VBS Geo to meet the specific requirements of the intended scenario and training delivery without the need for additional specialist Geographic Information Systems (GIS) applications or knowledge. For example, the user can quickly move a road, or add a building or a fence, and VBS4 does the rest.

VBS4 AI entities follow the new road, stop at pedestrian crossings, and avoid any new buildings or fences, and so on. The tool enables both small-scale edits (for example, creating a trench-line for a defensive position) to large-scale city-building (for example, importing vector data describing roads and buildings for an entire city). By comparison, the VBS3 terrain editing tool (Visitor 4) and most other terrain building tools are complex to use and require extensive training to use effectively.

Terrain editing in VBS Geo is at least 10x faster than Visitor 4 (The VBS3 terrain editing tool), and VBS Geo can be used by a technically-minded soldier, sailor, or airman - no need for training courses and a specialist engineer.

**Image-5: Road editing in VBS Geo**


VBS Geo allows training instructors who are non-terrain experts to iteratively and rapidly:

- Add / remove roads and choose road width and surface type (for example, asphalt or dirt, and so on).
- Place, rotate, and scale any of the tens of thousands of environmental 3D models in the VBS4 database in addition to any third-party models.
- Add geographically appropriate vegetation from hundreds of species of plants, bushes, and trees with automatic, realistic, and natural distributions.
- Manually adjust elevation data, either flattening areas, raising the terrain, lowering the terrain, adding berms or trenches with centimeter-level control.
- Import common geo-referenced data types such as GeoTiff or DEM.
- Alter the procedurally defined (generated in real-time), out-of-the-box surfaces with an array of brushes or polygon fill tools.

For more information, see VBS Geo Overview in the VBS Geo Manual.

## 2.2 VBS Plan – Rapid Mission Planning and Execution

VBS Plan is a new mission planning tool that allows any user to quickly *sketch out* and execute a tactical plan without prior simulation or scenario generation knowledge. Like VBS Geo, VBS Plan is built directly into VBS4 and is immediately accessible from the Prepare user interface.

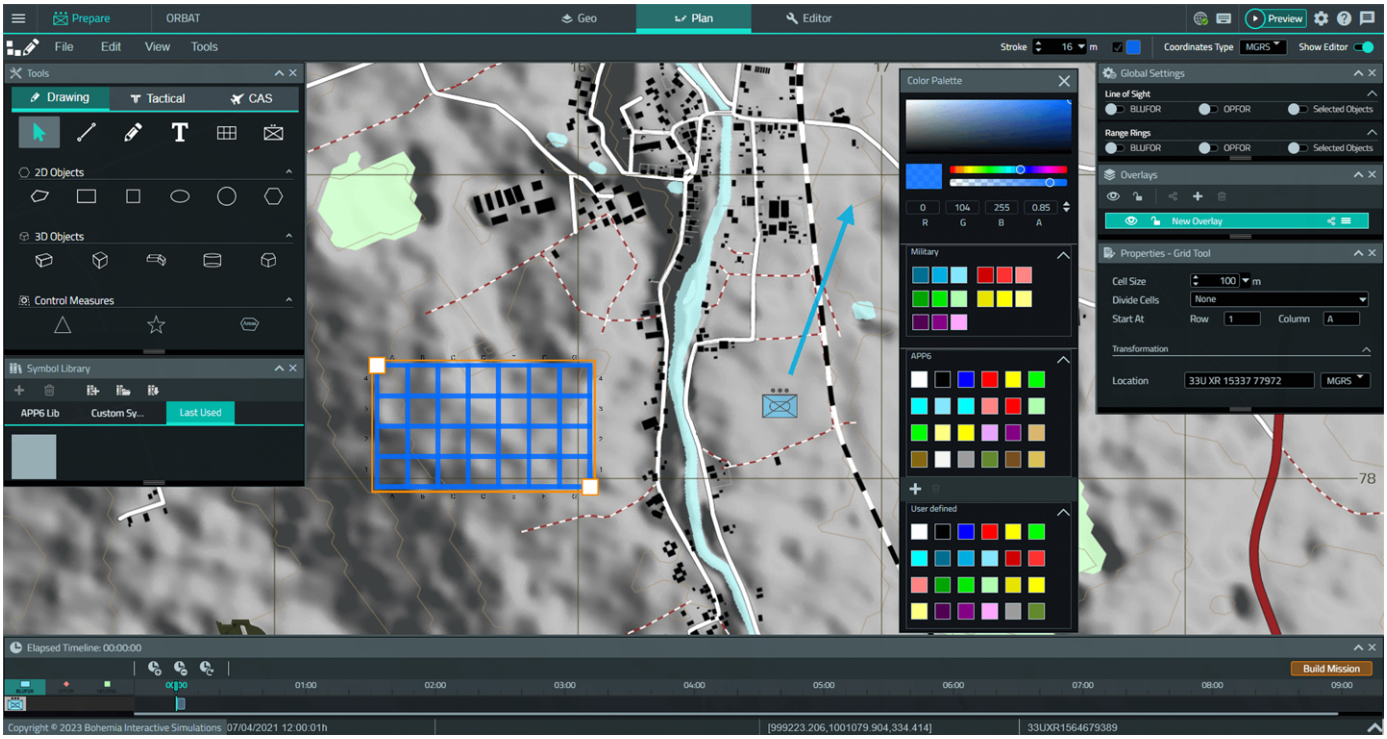
VBS Plan provides a revolutionary scenario generation approach whereby the user places military tactical markings (for example; phase lines, advance, defend, attack, and so on) and unit symbols (for example, MIL-2525C) at a constructive level, and then VBS4 automatically creates the individual virtual entities and assigns behaviors.

VBS Plan is a very rapid, intuitive way to access the massive model library and VBS Control AI behaviors, delivered as part of the VBS4 capability package, and to form the assets into a synchronized military plan. This approach massively reduces scenario development time and need for detailed software expertise, freeing up instructors to focus on developing scenarios which maximize learning.

Once the user adjusts the timeline (coordination and synchronization) of certain predefined actions / phase lines / advances, and so on, the plan can be immediately executed in VBS4.

Developing the synchronized Company level scenario (shown below) was 35x faster using VBS Plan in VBS4 compared to building the same scenario in VBS3. Any technically aware instructor can build a scenario - with no need for extensive VBS Editor-specific knowledge.

**Image-6: Developing a plan in 3D in VBS Plan**




Scalability improvements in VBS4 now support VBS Plan engagements of 2,000+ entities. Combining the capabilities of VBS Plan with the enhanced scalability of VBS4, large-scale combined arms / joint engagements can now be trained within VBS4.

The VBS4 scalability enhancements are demonstrated in a video at https://youtu.be/ADR5Dk0G2aY.

> **NOTE**
>
> The videos may not be up to date with the features they demonstrate, the latest state of which is described in this manual.

The easy-to-use VBS Plan mode effectively brings together the massive model library of VBS, the pre-developed VBS Control behaviors, and the full power of the new global terrain and scalability capabilities of VBS4 to converge constructive and virtual training capability into a single, easy-to-use product.

For more information, see VBS Plan Overview in the VBS Plan Manual.

## 2.3 Using the VBS4 Workflow

The VBS4 Manuals are built around the workflow, to enable different user roles to focus on their specific phase:

- **Deploy**

  Install VBS4 as a Client application, setup and start the VBS World Server, and then start VBS4 as an Administrator or Trainee in order to perform your specific role.

  To install VBS4 and VBS World Server, see the VBS4 Deployment Guide.

  To manage your VBS4 deployment as an administrator, see the following topics:

  - VBS World Server Overview in the VBS World Server Manual
  - Administrator Overview in the VBS4 Administrator Manual

- **Prepare**
  - Create Battlespaces to organize your training Scenarios.

    For more information, see Battlespace Management (on page 57).
  - Edit terrains and collaborate with other users to build terrains with an easy-to-use interface.

    For more information, see VBS Geo Overview in the VBS Geo Manual.
  - Facilitate commander training with the easy-to-use VBS4 mission planning tool.

    For more information, see VBS Plan UI Overview in the VBS Plan Manual.
  - Create complex scenarios with the powerful 3D VBS Editor.

    For more information, see VBS Editor Overview in the VBS4 Editor Manual.

  The Prepare phase of the workflow is described in more detail in Scenario Preparation (on page 85).

- **Execute**
  - Allow Instructors to manage and change any aspect of the scenario.

    For more information, see VBS4 Instructor Overview in the VBS4 Instructor Manual.
  - Enable commanders to plan missions at run-time and issue orders.

    For more information, see VBS Plan Overview in the VBS Plan Manual.
  - Give trainees control of a character from first-person perspective.

    For more information, see VBS4 Trainee Overview in the VBS4 Trainee Manual.
  - Provide full-featured radio simulation for communication practice.

    For more information, see VBS Radio Overview (on page 141).

  The Execute phase of the workflow is described in more detail in Scenario Execution (on page 89).
- **Assess**
  - Replay scenarios in 2D and 3D from any perspective, anywhere on the virtual Earth.
  - Review performance measures that are saved automatically during AAR capture.
  - Stream AAR recordings to client (Trainee) computers, see AAR Streaming in the VBS4 AAR Manual.

  The Assess phase of the workflow is described in more detail in Scenario Assessment (on page 101).
  - Through open APIs, leverage AAR data for use in third-party training management tools.

To help you get started with VBS4, follow the detailed instructions provided in the Quick Start Guide Overview in the VBS4 Quick Start Guide.

# 3. Differences from VBS3

VBS4 is a significant evolution of the Virtual Battlespace that includes major changes in the underlying engine technology, fundamental changes to the User Interface, and major new functionality, while also including the vast majority of the functions of VBS3.

The key improvements of VBS4 compared to VBS3 are ease of use, performance due to the new VBS Blue engine and simulation optimizations, and its Whole-Earth terrain representation. The new main menu workflow, and VBS Plan and VBS Geo, has been designed for non-engineers.

The aim is to unlock the power of VBS4 for every tech-aware soldier, sailor, and airman. From a customer perspective, this means faster generation of training scenarios (more *Bloodless Battles*), enhanced VBS3 use cases (better training) and new VBS4-only use cases (more types of training).

The following table compares VBS3 to VBS4:

| | VBS3 | VBS4 | Improvement |
|---|---|---|---|
| **Typical Startup** | 45 seconds | 15 seconds | >3x faster |
| **Terrain Resolution** | Gridded terrain with a maximum resolution of approximately 5m | Continuous terrain level of detail down to mm-scale | 1,000x more detailed |
| **Terrain Editing** | Visitor 4, an external tool | VBS Geo, a built-in tool | >10x faster and non-engineer accessible |
| **Building a Company Level Plan** | VBS3 Offline Mission Editor | VBS Plan | >35x faster and non-engineer accessible |
| **Frame Rate on Recommended Hardware** | 45 FPS | 60 FPS | >30% faster |
| **Whole-Earth Rendering with Realistic Object Densities** | No | Yes | Realistic global terrain out-of-the-box |
| **Draw Distance** | 10-20km (PC dependent) | Unlimited | No draw limits |

The following table describes the key functional differences between VBS3 and VBS4:

| | VBS3 | VBS4 | VBS4 Benefit |
|---|---|---|---|
| **Simulation** | Flat-Earth rendering and simulation. | Whole-Earth rendering with Flat-Earth simulation. However, this is not noticeable to users. | Train anywhere on the Earth. |
| **Engine** | *Real Virtuality* rendering engine from the Arma series of computer games. | VBS Blue, a completely new and updated rendering engine, with significant lighting and shading improvements. | The new rendering engine renders photo-realistic visuals and supports Physically Based Rendering (PBR). |
| **Content Development** | Well-defined process to import and configure new 3D content. | The 3D import pipeline is optimized, supporting auto-generation of LODs, and adding content directly from common modeling tools such as 3DMax, Maya, and Blender. | The process of importing new 3D content is quicker in VBS4, saving time and money. |
| **Terrain Representation** | Flat earth, relatively small, limited view distances, and always required a terrain to be developed by users and / or third parties to conduct training. | A Whole-Earth database is provided out-of-the- box with realistic view distances and realistic vegetation cover. Can easily be edited and improved upon using VBS Geo. | A massive improvement, providing a Whole-Earth database that looks accurate and is more than suitable to support the vast majority of typical VBS use cases. |
| **Terrain Editing** | The VBS3 RTE supports basic object placement and terrain manipulation within a scenario.<br>Visitor 4 is the included terrain tool, but it is difficult to use and requires the terrain to be packed and loaded into VBS3 to view the terrain edits. | VBS Geo is included with VBS4. It is a full-featured WYSIWYG terrain editor, which creates instantly ready-for-training terrains with no waiting for packing. | Faster terrain editing, with no VBS knowledge required to effectively use the tool. Much of the world is already built out, further reducing terrain development costs! |

| | VBS3 | VBS4 | VBS4 Benefit |
|---|---|---|---|
| **Mission Editing** | Offline Mission Editor (OME) and Real Time Editor (RTE) are included but suitable for advanced users only. | Full-featured mission planning tool (VBS Plan for easy, rapid plan building).<br>VBS Editor is also available for advanced users. | Commanders / Instructors can more easily use VBS4 to create and execute a plan. Advanced users (admins) benefit from reduced scenario development time. |
| **Performance** | 45 FPS maximum frame rate is typical. | 60 FPS frame rate is typical, with realistic view distances and building / vegetation density. Reduced load times. Takes full advantage of multi-core processors. | High frame rates are critical for immersive training, which is even more important in a VR environment. Higher frame rates also reduces / mitigates the impact of simulation sickness. |
| **After Action Review** | Includes 2D and 3D AAR replay, but terrain must exist locally to run the AAR. | Easier to use, and Whole-Earth terrain is always included. | AARs are directly accessible from the main menu, and are categorized by Battlespace. Faster to access and with less admin overhead. |

The sections below provide more information about the functional differences between VBS3 and VBS4:

## 3.1 VBS4 Client and VBS World Server

VBS4 is a Client-Server application, supporting an *Online* use case, where VBS4 Clients can connect to a separate VBS World Server that streams the Whole-Earth Terrain and also acts as a central repository of Battlespaces.

> **NOTE**
>
> To support the flexible use of your hardware, VBS4 supports an *Offline* use case, where a VBS World Server is not required.

This change results in significant differences compared to VBS3:

- VBS4 deployment consists of VBS4 Client and Dedicated Server installations and the separate deployment of a VBS World Server.

  For more information, see Deploying VBS4 in the VBS4 Administrator Manual.

- A Scenario Execution is typically hosted on a separate Dedicated Server or on a VBS4 Admin Client and not hosted by the VBS World Server.

  For more information, see Scenario Execution (on page 89).

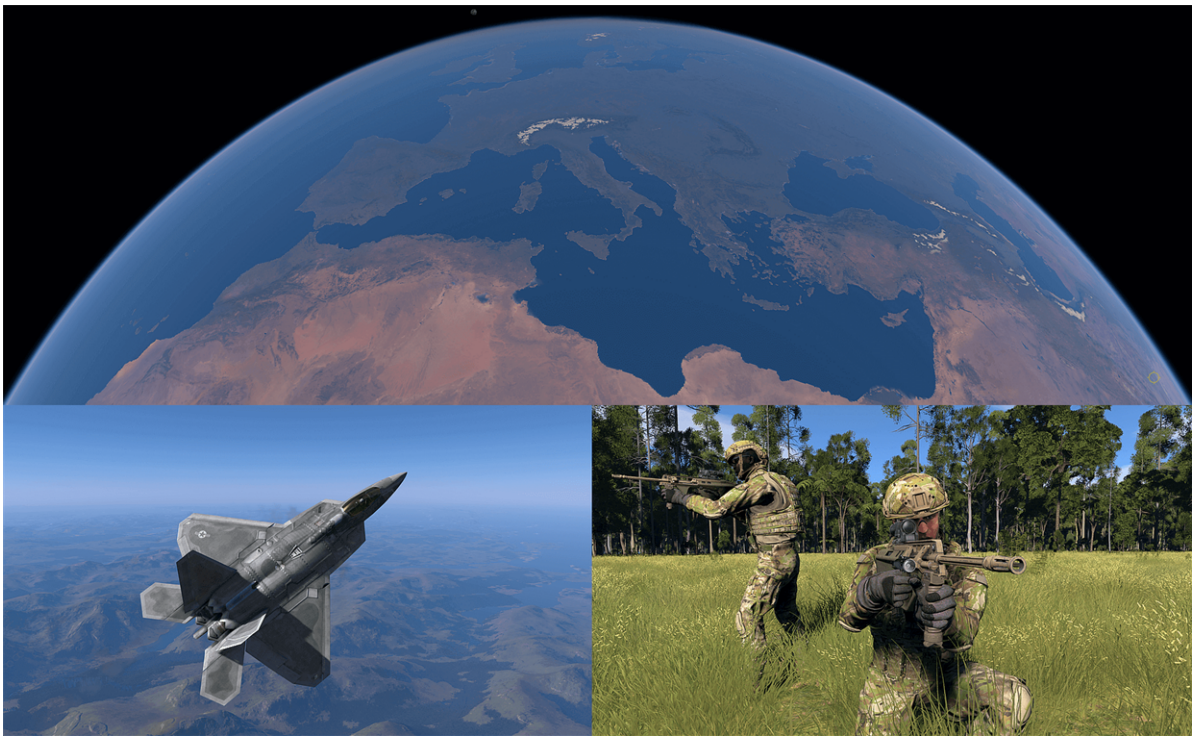
- All VBS4 Clients and Dedicated Servers select whether to use the *Online* use case, connected to a VBS World Server, or the *Offline* use case, without that connection, when they start.

  For more information, see Starting VBS4 in the VBS4 Administrator Manual.

## 3.2 Terrain Storage and Editing

VBS Blue is the powerful, flexible, and military-oriented rendering engine and data-ingestion pipeline behind VBS4, developed in-house by Bohemia Interactive Simulations. VBS Blue is built with military simulation use cases in mind including global scale, mm-level accuracy, and flexible, procedurally-enhanced terrain representation.

**Image-7: VBS4 renders realistic terrain, from space down to blades of grass**



The new engine results in significant differences compared to VBS3:

- **Whole-Earth Terrain**

  The Whole-Earth Terrain replaces the separate individual terrains used in VBS3. The VBS World Server hosts the Whole-Earth Terrain, loads specific terrain edits, and serves that terrain to all connected VBS4 Clients during Scenario Execution. VBS4 can also host Whole-Earth terrain data locally, to run stand-alone (no VBS World Server required).

- **VBS Geo**

  VBS Geo provides a new terrain editing capability that replaces the VBS3 terrain editor, Visitor 4. Terrain edits are made as part of the Scenario Preparation process.

  These terrain edits are saved as a Geo Project, associated with the Battlespace containing the Scenario, that is loaded by VBS4 during Scenario Execution.

As a result of these changes, the following VBS3 functionality is not available in VBS4:

- **Terrain Modification Tool**

  The Terrain Modification Tool is not available in VBS Editor in VBS4. Use the Elevation Tool in VBS Geo instead.

  See Editing Terrain Elevation in the VBS Geo Manual.

- **Flood Modification Tool**

  The Flood Modification Tool is not available in VBS Editor in VBS4. Use the Water Tool in VBS Geo instead.

  See Placing and Editing Water in the VBS Geo Manual.

- **Biotope Loader**

  The Biotope Loader is not available in VBS Editor in VBS4. Use the Surface Tool in VBS Geo instead.

  See Editing Terrain Surfaces in the VBS Geo Manual.

- **Promotion / Removal of Visitor Placed Objects**

  VBS4 does not directly support maps created with Visitor.

  Use the Terrain Converter Tool to convert your VBS3 terrains into detailed terrain areas in the Whole-Earth Terrain.

  See in the VBS World Server Manual.

**WARNING**

While berms are functional in VBS4, Editor Objects with underground cutting (such as trenches) are not.

- To create berms, see Earthworks (Berms) in the VBS4 Editor Manual, or use VBS Geo.
- To create trenches, use VBS Geo.

VBS Geo berms and trenches cannot be modified by earth-moving vehicles.

For more information on using VBS Geo to create berms and trenches, see Placing and Editing Models and Elevation Line Editing in the VBS Geo Manual.

## 3.3 Rendering

VBS Blue is cutting-edge technology, capable of rendering unlimited view distances with weather, particle effects, day / night, regional and seasonal vegetation, along with many other real-world natural features. VBS Blue has been designed from the outset to efficiently render complex, cluttered, and congested scenes at high frame rates for space, land, air, and sea domain simulations and adding procedural detail to basic terrain data on-the-fly.

This change results in the following differences compared to VBS3:

- VBS4 uses an entirely different set of Video Options.

  For more information, see Video Settings in the VBS4 Administrator Manual.

- The following VBS3 video capture functionality is not available in VBS4:
  - Live Stream Broadcast
  - Record Video Tool
  - Recording Video using GBOSS Security Camera

  Bohemia Interactive Simulations recommends using free and readily available recording tools, such as Nvidia ShadowPlay, to replace this functionality.

## 3.4 VBS4 User Interface

VBS4 uses a radically different approach to the front end user interface focused on the Whole-Earth Terrain and Battlespaces instead of the Main Menu approach in VBS3.

The Whole-Earth Terrain enables you to rapidly focus on specific locations on the Earth and quickly Prepare a Scenario that meets your training needs.

For more information, see VBS4 UI Overview (on page 33).

## 3.5 Disabled VBS3 Functionality

The development of VBS4 is an ongoing process intended to support as many VBS3 features as possible. However, significant changes in the underlying technology of VBS4 mean that some existing VBS3 features do not work as intended and require additional development.

The following features are disabled in this release:

- Chemlights
- Heat Haze Effect
- Surface Radar

**FEATURE NOTICE**

Bohemia Interactive Simulations intends to enable the majority of these features or provide equivalent replacement features in future releases of VBS4.

## 3.6 VBS3 Terrains and Missions

The Whole-Earth Terrain replaces the terrains used in VBS3. You can convert terrains created for VBS3 using the Terrain Conversion tool.

For more information, see in the VBS World Server Manual.

By default, VBS3 missions cannot be edited or executed in VBS4. However, you can convert VBS3 missions to VBS4 scenarios, using the Mission Converter tool.

For more information, see Mission Converter in the VBS4 Editor Manual.

VBS3 Training Scenarios are replaced by a Training Battlespace in VBS4.

For more information, see in the VBS4 Trainee Manual.

## 3.7 Third-Party Products and Integrations

VBS4 does not support VBSFusion or the Application Scripting Interface (ASI). Plugins and products developed using VBSFusion and the ASI, such as VBSFires, are not supported in VBS4.

To develop plugins, products, and functionality for VBS4 use VBS Simulation SDK.

For more information, see VBS Simulation SDK (on page 155) or contact Support at support@bisimulations.com.

# 4. Deploying VBS4

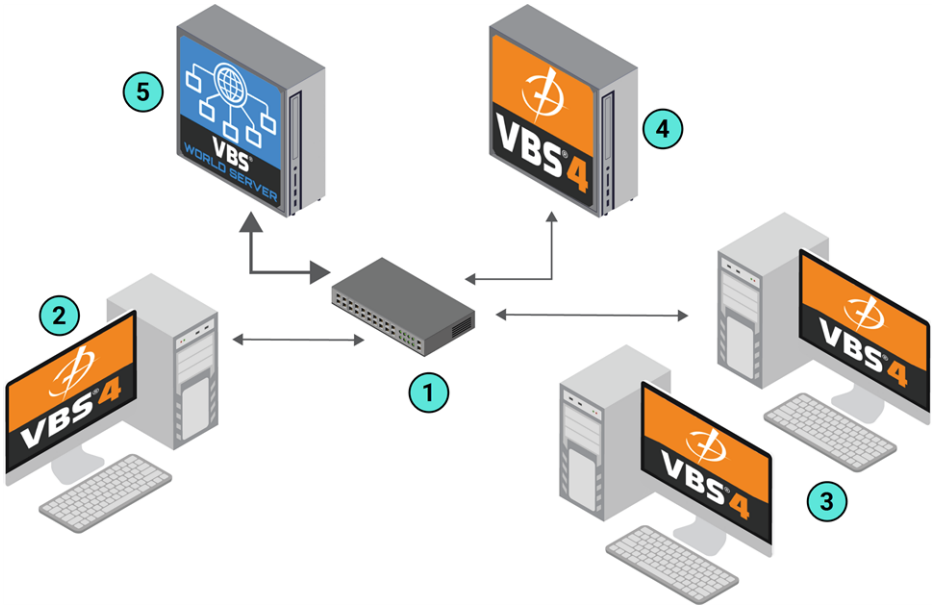
VBS4 is available for download from VBS License Manager and consists of multiple product installers and packages:

- VBS World Server installer
- VBS4 Client / Dedicated Server installer
- A set of mandatory core download packages
- A set of optional download packages.

**WARNING**

VBS4 and VBS World Server installations must be the same major version (e.g., 21.1.x) to ensure full compatibility.

For most use cases, a VBS4 deployment consists of the products shown in the following diagram.




| | | |
|---|---|---|
| 1 | **Network Switch** | The recommended setup for VBS4 deployments is for all clients and servers to share the same network. |
| 2 | **VBS4 Admin Clients** | The Admin Client is a VBS4 Client installation started with Administrator privileges for the following primary purposes:<br>• **Prepare** - Design Scenarios by creating a Battlespace containing terrain edits, a tactical plan, and a mission.<br>• **Execute** - Start and manage a Scenario as the Instructor.<br>• **Assess** - Run After Action Review to playback a Scenario Execution. |

| | | |
|---|---|---|
| 3 | **VBS4 Trainee Clients** | Each Trainee Client is a VBS4 Client installation started with default user privileges in order to participate in Scenario Executions. |
| 4 | **VBS4 Dedicated Server** | The Dedicated Server is a VBS4 Client installation started as a server to host the Scenario. |
| 5 | **VBS World Server** | For Online use cases the VBS World Server acts in two significant capacities:<br>• Streaming the base Whole-Earth Terrain to connected VBS4 Clients.<br>• Acts as the central repository of Battlespaces.<br><br>**TIP**<br>Bohemia Interactive Simulations recommend a faster network connection between the VBS World Server and the network switch. For more information, see System Requirements in the VBS4 Deployment Guide.<br><br>**NOTE**<br>VBS4 supports Offline use cases where VBS World Server is not required. |

**To download and install VBS4 for most use cases, follow this process using the VBS4 Deployment Guide:**

1. Review VBS4 Deployment Options to assess the deployment requirements that meet your training needs.
2. Review the System Requirements.
3. Download VBS4 from VBS License Manager.
4. Install VBS World Server, see Installing VBS World Server.
5. Install as many Dedicated Servers and VBS4 Clients as required for your training needs, see Installing VBS4.

Your VBS4 deployment is installed.

**WARNING**

Additional World Data packages are available on VBS License Manager that are not installed by default.

Download and deploy them using the Updater Tool. For more information, see Installing World Data in the VBS World Server Manual.

To support patch updates and later download of optional packages, VBS4 includes update utilities for VBS World Server and VBS4 Clients.

See the following topics in the VBS4 Administrator Manual.

- Installing a VBS World Server Patch
- Updating VBS4

After successful deployment, you are ready to start VBS4:

1. If it is not already running, start VBS World Server:

   Run `\WS_Installation\vws_start.exe`

2. Start the Dedicated Server and VBS4 Clients:

   See Starting VBS4 in the VBS4 Administrator Manual.

# 5. VBS4 UI Overview

After starting VBS4 as an Administrator, the user interface starts in Battlespaces Mode, providing the primary access point to Prepare, Execute as a Host, and Assess Scenarios. Scenario Execution using a Dedicated Server is started from Training Mode.


The VBS4 UI starts in Battlespaces Mode and displays the following main UI elements:

| | | |
|---|---|---|
| 1 | **VBS4 Toolbar** | The VBS4 Toolbar (on page 35) provides access to a set of global and context-specific functions.<br><br>**NOTE**<br>The VBS4 Toolbar is available in all modes, but its content is mode specific. |
| 2 | **Battlespaces List** | Use the Battlespaces List to create and manage Battlespaces, and then to access the VBS4 functions required to Prepare, Execute as a Host, and Assess your Scenarios.<br>For more information, see Battlespace Management (on page 57). |
| 3 | **Whole-Earth Terrain** | Navigate the VBS4 rendering of the entire Earth using the Whole-Earth Terrain (on page 48). |

Trainees start VBS4 in the Training UI which Administrators can also access by clicking **Training** in the VBS4 Toolbar:


- Use the Multiplayer **Connect to Server** button to access a Dedicated Server and start or join Multiplayer Training.

  For more information, see Dedicated Server Scenario Execution (on page 89) and Joining a Multi-Player Scenario in the VBS4 Trainee Manual.

- Use the Singleplayer Battlespace list to start a solo training scenario.

  For more information, see Single Player Training in the VBS4 Trainee Manual.

For information about the VBS4 User Interface in other modes, see the following topics:

**Prepare**

- VBS Geo User Interface in the VBS Geo Manual
- VBS Plan UI Overview in the VBS Plan Manual
- Mission Designer Interface in the VBS4 Editor Manual

**Execute**

- Instructor Interface in the VBS4 Instructor Manual
- Joining a Scenario in the VBS4 Trainee Manual

**Assess**

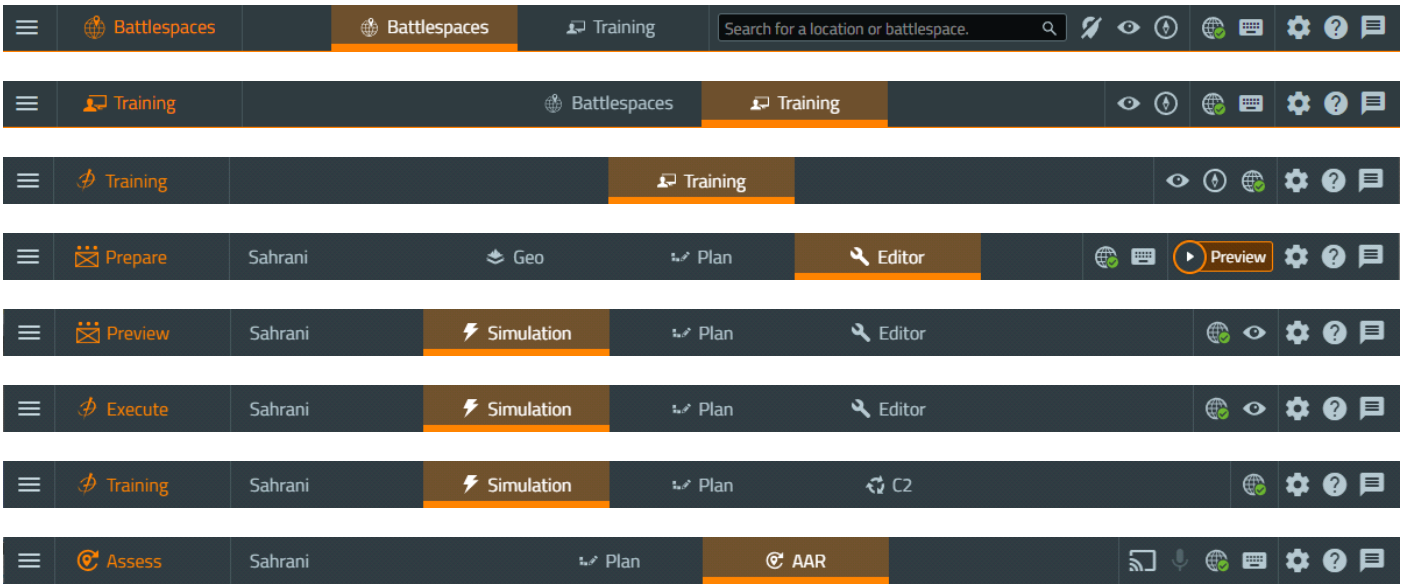
- AAR Playback and the User Interface in the VBS4 AAR Manual

# 5.1 VBS4 Toolbar

The VBS4 Toolbar is available in all modes, and provides access to a set of global and context specific functions.

From left to right, the Toolbar contains the following context sensitive items:

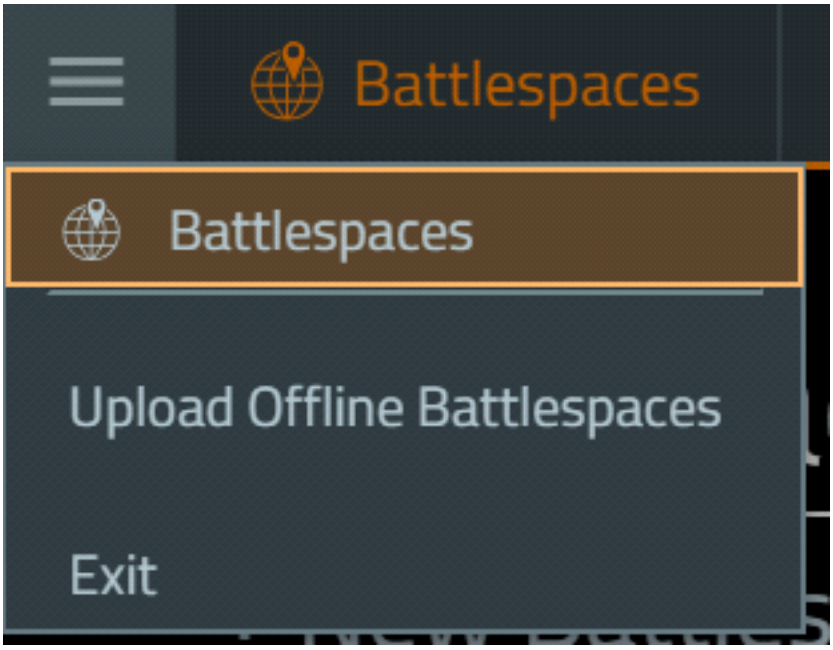
- VBS4 Main Menu (on the next page)
- Mode Indicator
- The Battlespace name displays in Prepare, Preview, Execute, and Assess modes.
- Administrators can switch between Battlespaces and Training mode.
- In Prepare, Preview, Execute, and Assess modes, Tool Selection (on page 37) is available.
- In Battlespaces and Training modes, the Global Navigation Toolbar (on page 37) is available to Administrators.
- In Assess Mode, AAR Streaming Controls (on page 39) are available to Instructors.
- Connectivity (on page 40) icons display the status of the connections to VBS World Server and enable Administrator access to the VWS Dashboard.
- Camera Controls (on page 42)
- In Prepare Mode, Preview (on page 44) is available.
- VBS4 Settings (on page 45)
- Documentation (on page 46)
- Notifications (on page 47)



### 5.1.1 VBS4 Main Menu

Click the **Main Menu** icon to open the context sensitive Main Menu.




In Battlespaces and Training Mode, the Main Menu provides access to the following options:

- **Upload Offline Battlespaces**

  Synchronize your local Battlespaces with the Battlespace on VBS World Server.

  For more information, see Synchronize Battlespaces (on page 68).

  > **NOTE**
  > This option is only available in Online modes, connected to VBS World Server.

- **Exit**

  Click to close the VBS4 Client.

> **NOTE**
> The Client window closes in a few seconds, but VBS4 processes may take as long as a minute to fully close in the background.

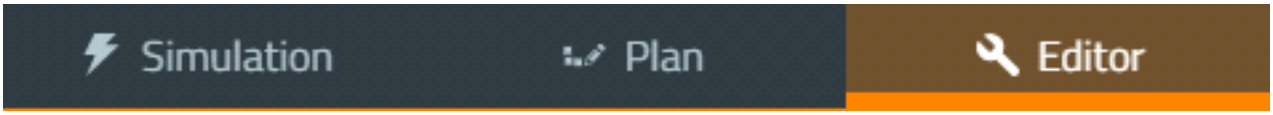
The Main Menu is contextual and the functions available depend on the current Mode and active Tool.

For more information about the Main Menu options in other modes, see the following topics:

- VBS4 Main Menu for VBS Geo in the VBS Geo Manual
- VBS4 Main Menu for Mission Planning in the VBS Plan Manual
- VBS4 Main Menu for Mission Design in the VBS4 Editor Manual
- VBS4 Main Menu for Scenario Execution in the VBS4 Instructor Manual
- VBS4 Main Menu for Training in the VBS4 Trainee Manual
- VBS4 Main Menu for the AAR in the VBS4 AAR Manual

## 5.1.2 Tool Selection

In Prepare and Execute Modes, use the Tool Selection bar to switch between the VBS4 Tools.




- When Preparing or Executing a Scenario, click the Tool name to switch seamlessly between VBS Geo, VBS Plan, and VBS Editor.

> **NOTE**
> VBS Geo is only available in Prepare Mode.

For information about using these tools, see the following topics:

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

## 5.1.3 Global Navigation Toolbar

The Global Navigation Toolbar is located on the main VBS4 Toolbar.


In Battlespaces mode, use the Search Bar to locate places in the Whole-Earth Terrain, using place names, or comma-separated latitude and longitude co-ordinates, for example 33°20'32"N, 69°12'50"E.

Search uses location data from the following sources:

- A connected VBS World Server.
- Google Location Search (used when not connected to VBS World Server, requires internet access).

Type in the place name, and select from the dynamic search results, which are displayed in a drop-down list. The results are displayed by type, in the following order:

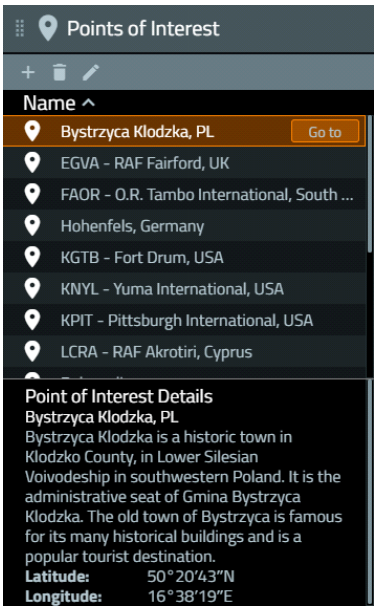
- Battlespaces
- POIs
- Google Maps locations

The Whole-Earth Terrain reorients, centered on the selected location.

Click the **Eye Icon** to toggle marker visibility for POI / Battlespace Markers.

For more information, see Whole-Earth Terrain (on page 48).

Click the **POI Icon** to open / close the Points of Interest panel, showing specific bookmarked locations.




For more information, see Using POIs (on page 51).

> **NOTE**
>
> When the POI Panel is displayed, the POI Markers are displayed instead of the Battlespace Markers on the Whole-Earth Terrain.

Click the **Reset Camera to North Icon** to reorient the camera in the Whole-Earth Terrain, so that North is at the top.

## 5.1.4 AAR Streaming Controls

In Assess Mode, click the following icons to stream recorded AARs to clients on the same network.

| Icon | Description |
|---|---|
|  | Click to stream an AAR recording to clients. |
|  | Click to enable voice communication to clients utilizing VBS Radio. |

For more information, see AAR Streaming in the VBS4 AAR Manual.

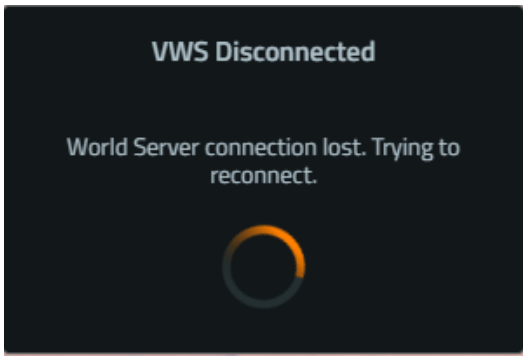
## 5.1.5 Connectivity

The World Server Status icon (globe) indicates whether you are connected to the VBS World Server, or in Offline Mode.

- Connected to the VBS World Server (Online Mode), **green** check mark.

VBS4 has the following VBS World Server connectivity problem indicators:

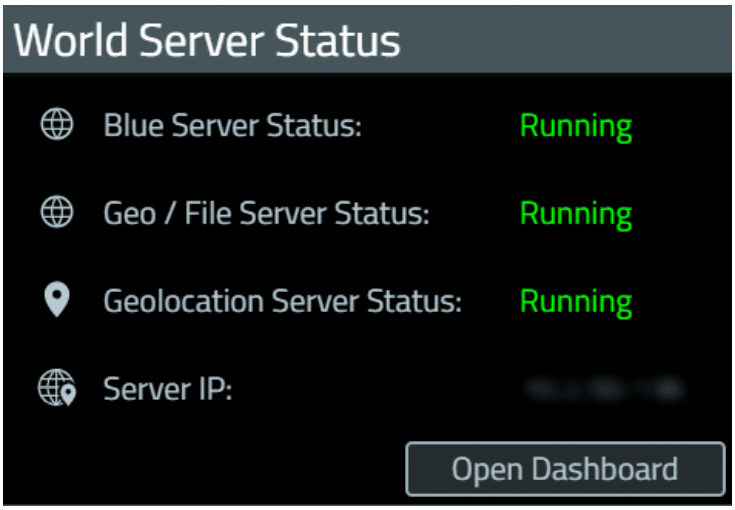
If connection to the VBS World Server is lost, the **VWS Disconnected** popup appears:



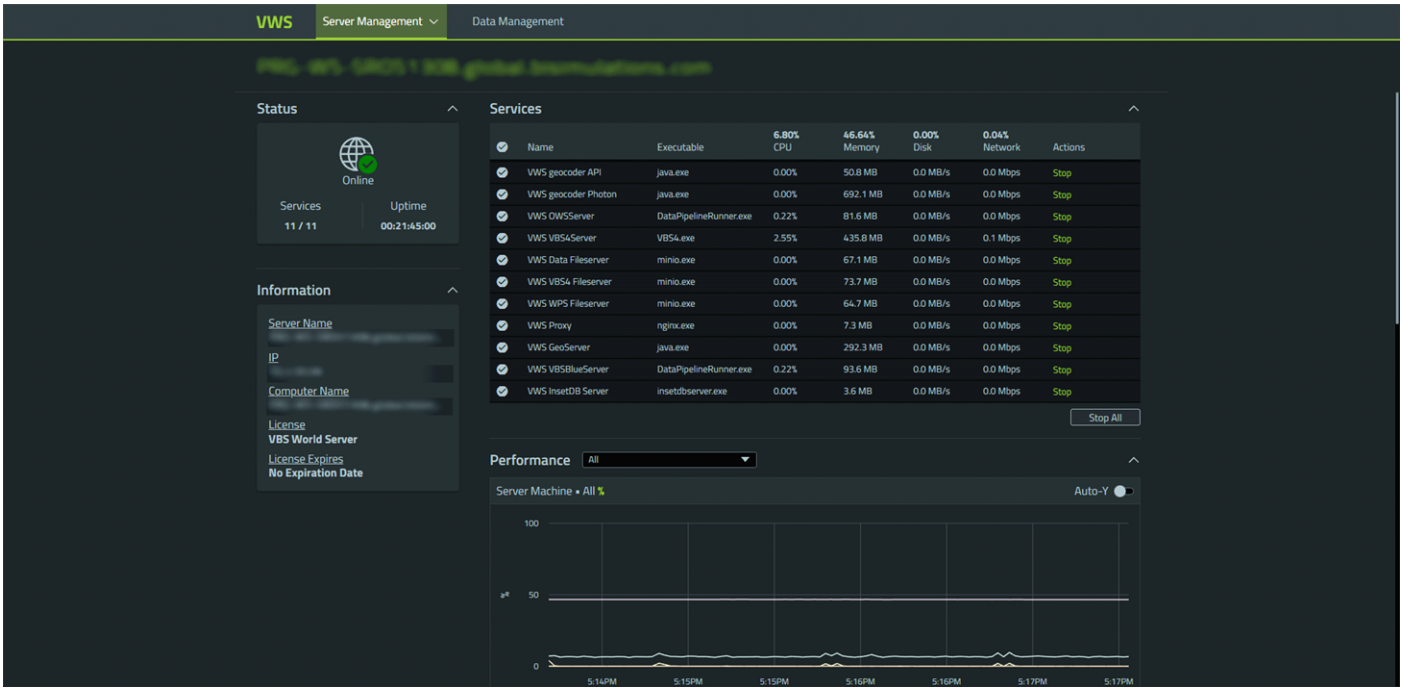

If the Geo / File Server service is not running the World Server Status icon displays a **red** cross.

- In Offline Mode, the World Server Status displays a **gray** disconnected icon.

Hover your cursor over **World Server Status** icon to check the status of the VBS World Server that the VBS4 Client is connected to, and to access the VWS Dashboard for a connected VBS World Server.




Administrators can access the VWS Dashboard for the connected VBS World Server by clicking **Open Dashboard**.




For more information, see The VBS World Server User Interface in the VBS World Server Manual.

## 5.1.6 Camera Controls

The following camera types are available:

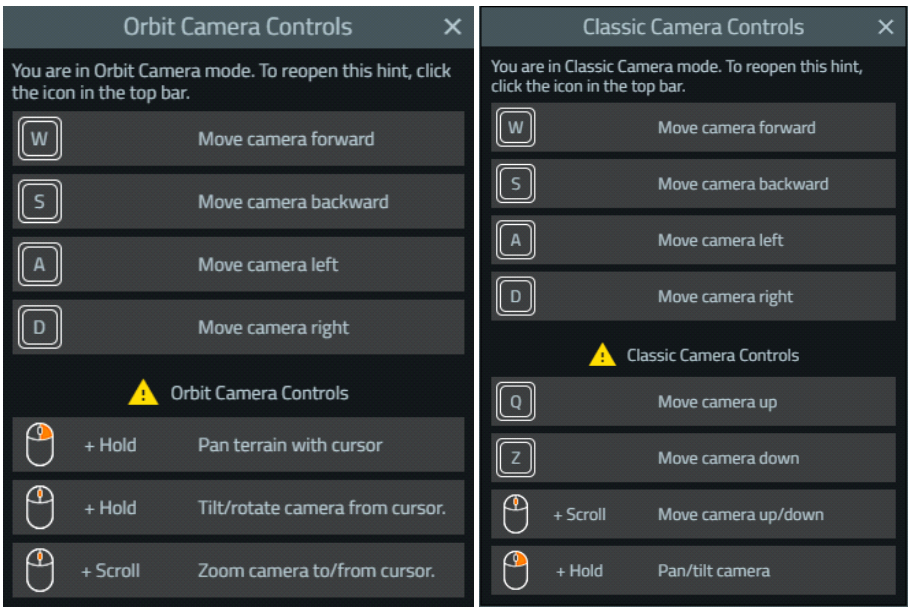
- Orbit and Classic Camera (below)

  The current camera position can be saved using Camera State (on the next page) hotkeys.

- Spectator Camera (on the next page)

**Orbit and Classic Camera**

For Orbit and Classic Camera, click the **Keyboard Icon** to open the Controls Panel displaying the applicable camera controls for your current Mode.




The Orbit Camera applies to the Whole-Earth Terrain and is an option in VBS Geo. For more information, see the following topics:

- Whole-Earth Terrain (on page 48)
- VBS Geo User Interface in the VBS Geo Manual

The Classic Camera applies to VBS Plan and VBS Editor and is the default camera in VBS Geo. For more information, see the following topics:

- VBS Geo User Interface in the VBS Geo Manual
- View Controls in the VBS Plan Manual
- 3D Camera and 2D Map Views in the VBS4 Editor Manual
- Instructor Views and Perspectives in the VBS4 Instructor Manual

In VBS Geo switch between camera modes using the **Camera Controls** drop-down.

### Camera State

The current position and state of the camera, including date and time, can be saved for later reference:

- Press **Ctrl + Alt + S**

VBS4 saves the camera state to your Windows clipboard.

> **TIP**
>
> Bohemia Interactive Simulations Customer Support may request a camera state file to help resolve issues. Immediately after saving the camera state, you can paste it into a text document by pressing **Ctrl + V**.

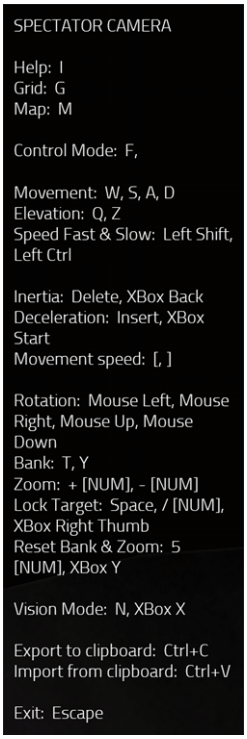
To restore the saved camera state:

- Press **Ctrl + Alt + L**

VBS4 restores the saved camera position.

### Spectator Camera

For the Spectator Camera, click the **Eye Icon** to open the Controls Panel displaying the applicable camera controls for the Preview and Execute Modes.



The Spectator Camera is available in the player simulation. For more information, see the following topics:

- Spectator Camera in the VBS4 Instructor Manual

### 5.1.7 Preview

The Preview button is specific to Prepare Mode and displayed in the VBS4 Toolbar when using VBS Geo, VBS Plan, and VBS Editor.


Click **Preview** to start the current state of the Scenario as a single-player mission.

The Scenario starts as a playable mission with you controlling the first playable character placed in the Scenario.

- Play the Scenario as a Trainee to preview the Scenario in action.

  For information about controlling your character, see the VBS4 Trainee Manual.

- Modify the Scenario as an Instructor to play test various aspects of the Scenario.

  Press **Map** (**M**) or **Pause** (**Esc**), and select **Editor** to open VBS Editor in Preview Mode.

  Preview Mode provides the majority of the same VBS Editor functions as Execute Mode.

  For more information, see Instructor Interface in the VBS4 Instructor Manual.

  > **NOTE**
  > Any changes made to the Scenario during the Preview only persist for the duration of the Preview and are not saved as part of the Battlespace.

- Restart the Scenario as an Instructor.

  Press **Pause** (**Esc**) and in the **Main Menu** in the VBS4 Toolbar, select **Restart Battlespace**.

- Return to the Editor UI in Prepare Mode to continue editing the Scenario.

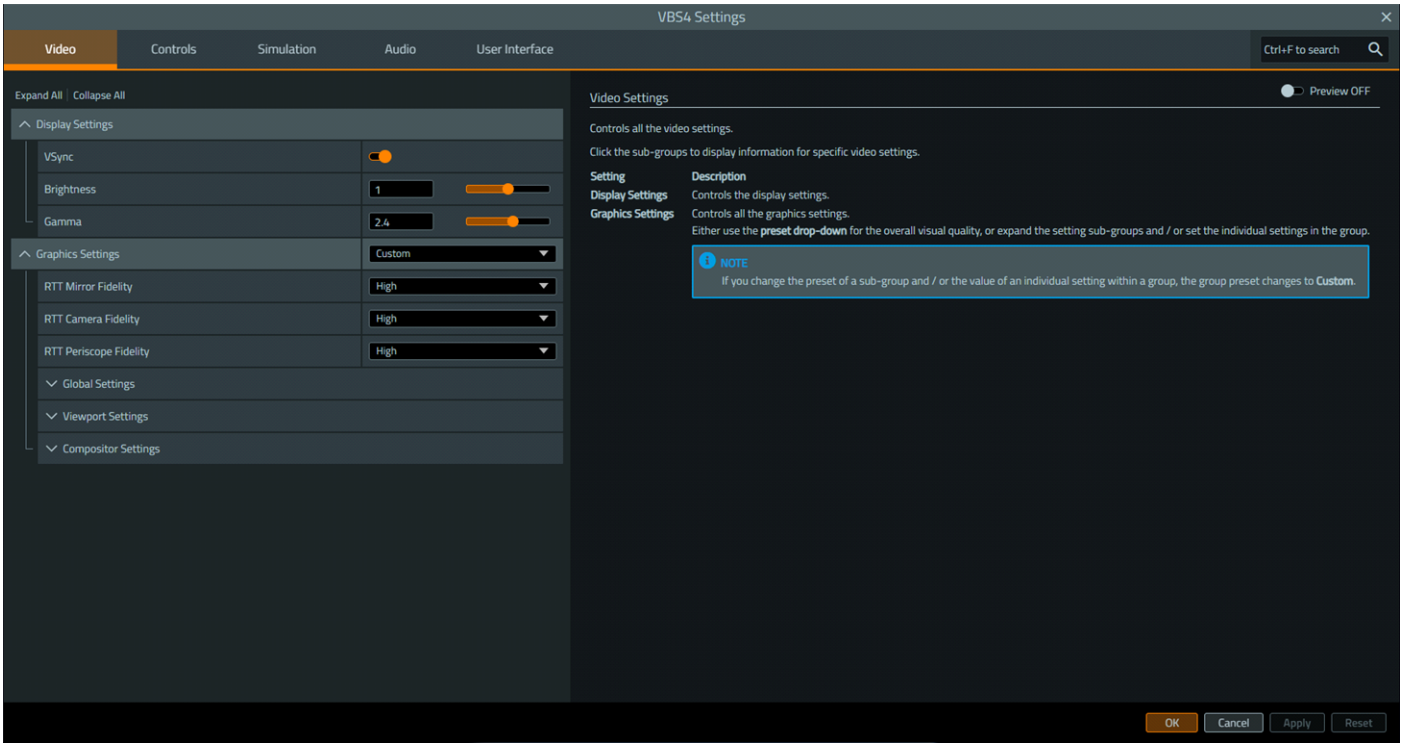
  Press **Pause** (**Esc**) and in the **Main Menu** in the VBS4 Toolbar, select **End Battlespace**.

- Open the Config Browser.

  Press **Pause** (**Esc**) and in the **Main Menu** in the VBS4 Toolbar, select **Config Browser**.

## 5.1.8 VBS4 Settings

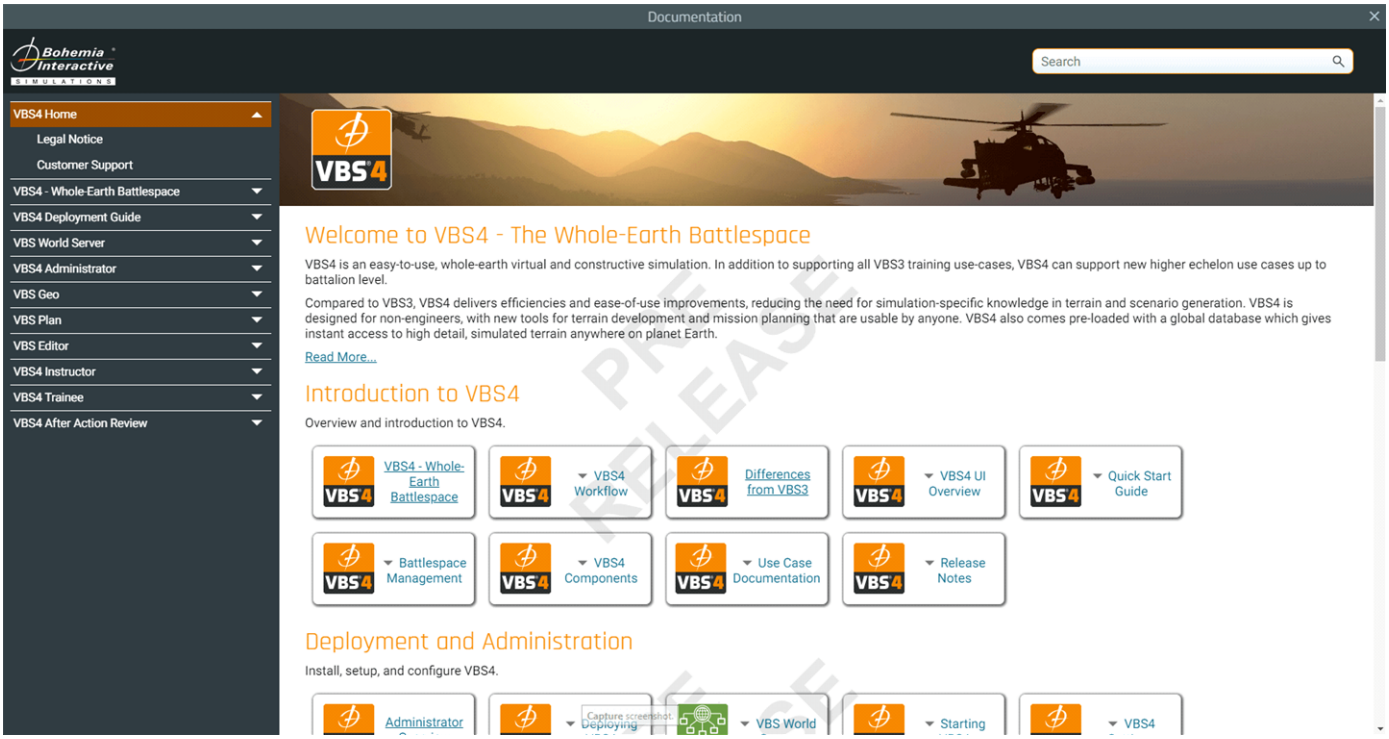
Click the **Settings Icon** to open the VBS4 Settings panel and configure how VBS4 functions.




For more information, see VBS4 Settings in the VBS4 Administrator Manual.

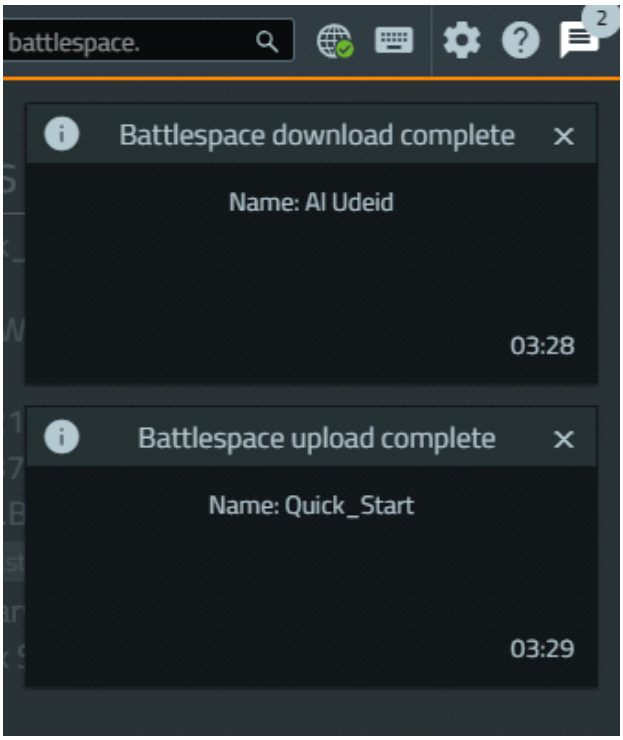
## 5.1.9 Documentation

Click the **Help Icon** to open the Documentation panel containing the VBS4 Manuals.



## 5.1.10 Notifications

Click the **Notifications Icon** to open and close the Notifications Panel and view VBS4 status messages.

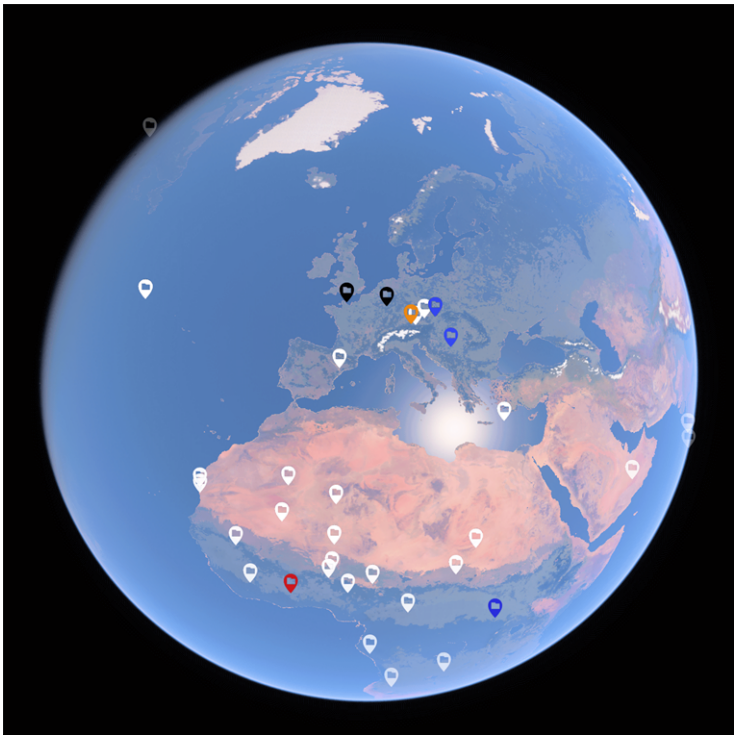




**NOTE**

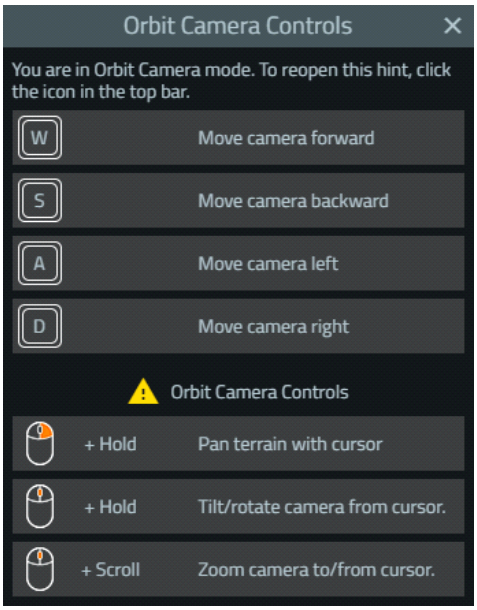
Notifications that CBRN1, CBRN3, CAS 5-Line, and CAS 9-Line Forms were received can be opened by clicking **View Form**. For more information, see Forms in the VBS4 Trainee Manual.

## 5.2 Whole-Earth Terrain

The Whole-Earth Terrain provides a navigable representation of the globe, displaying geolocated Points of Interest and Battlespaces, and the functionality to create new ones.



Navigate the Whole-Earth Terrain to view a region of interest using the Orbit Camera Controls:



**NOTE**

The Orbit Camera in the Whole-Earth Terrain and VBS Geo and the Classic Camera in VBS Plan and VBS Editor operate in different ways even though they share some of the same controls.

- The Classic Camera uses the camera position as the focal point. Turning or tilting rotates the camera itself.
- The Orbit Camera uses the position of the cursor in the terrain as the focal point. Turning or tilting the camera rotates it in an orbit around the focal point, and Zoom moves in towards and out from the focal point.

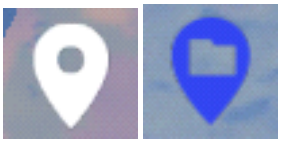
Click the **Keyboard Icon** in the VBS4 Toolbar (on page 35) to view the current Camera Control scheme.

**NOTE**

Whole-Earth navigation is completely disabled for Trainees and disabled for Administrators when the Multiplayer panels or Network Lobby are open.

Click the **Reset Camera to North Icon** to reorient the camera in the Whole-Earth Terrain, so that North is at the top.

Points of Interest and Battlespaces are represented by custom-colored markers in the Whole-Earth Terrain:



Click the **POI Icon** in the VBS4 Toolbar to toggle between POI Markers and Battlespace Markers in the Whole-Earth Terrain and to open and close the Points of Interest Panel.

- Right-click a Marker to view its menu.
- Right-click an empty area of terrain to create a new POI or Battlespace.

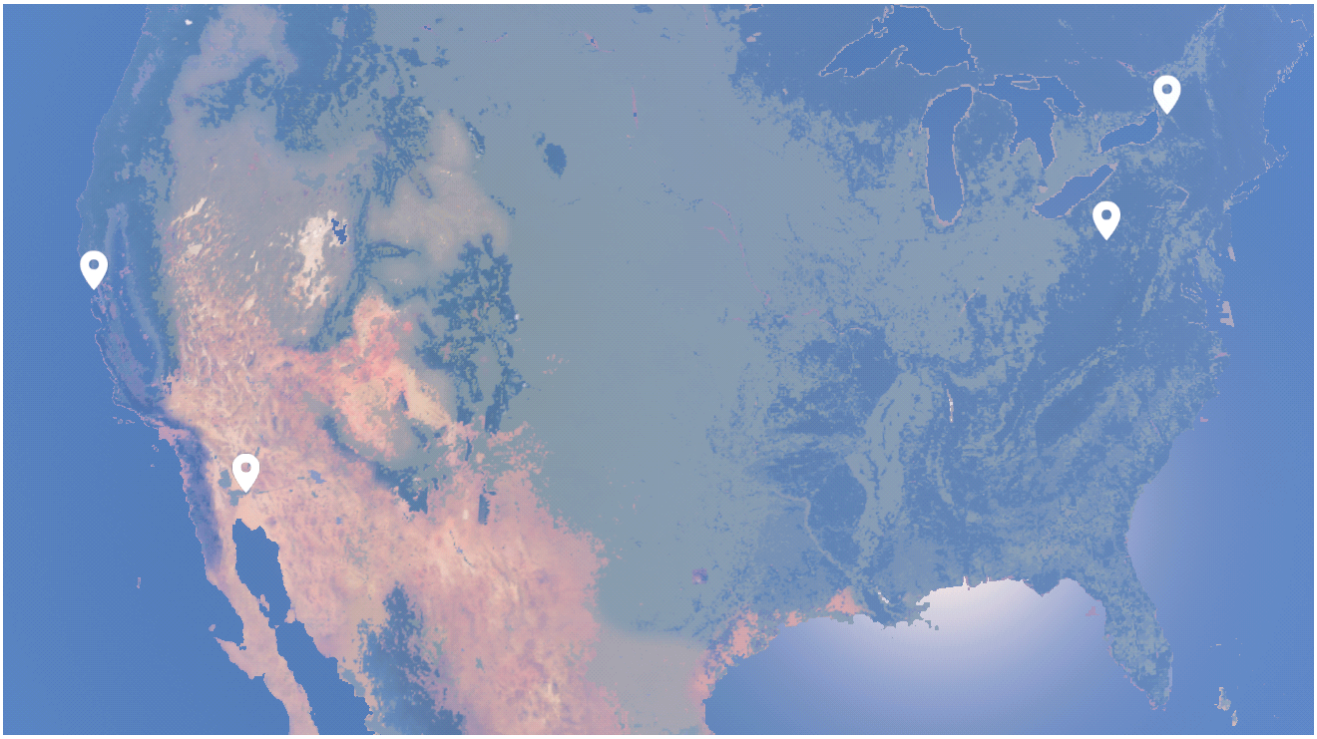
For more information, see:

- Using POIs (on the next page)
- Battlespace Management (on page 57)

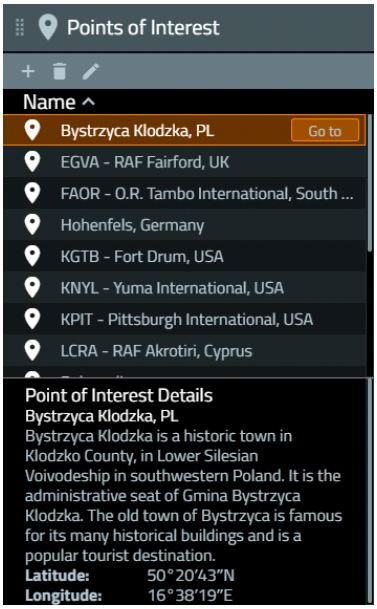
 

# 5.3 Using POIs

Points of Interest (POIs) are geolocated markers in the Whole-Earth Terrain that act as bookmarks to highlight specific locations on the globe, and provide quick navigation.



Click the **POI Icon** in the Global Navigation Toolbar (on page 37) to open the Points of Interest Panel, and display POI Markers in the Whole-Earth Terrain (on page 48).



> **NOTE**
> POI creation and edit functions are not available in Training Mode.

You can find a specific location, where you want to create a POI.

**Follow these steps:**

1. In the VBS4 Toolbar, input the **location** in the Search Bar.

   The input can be in any of the following location formats:

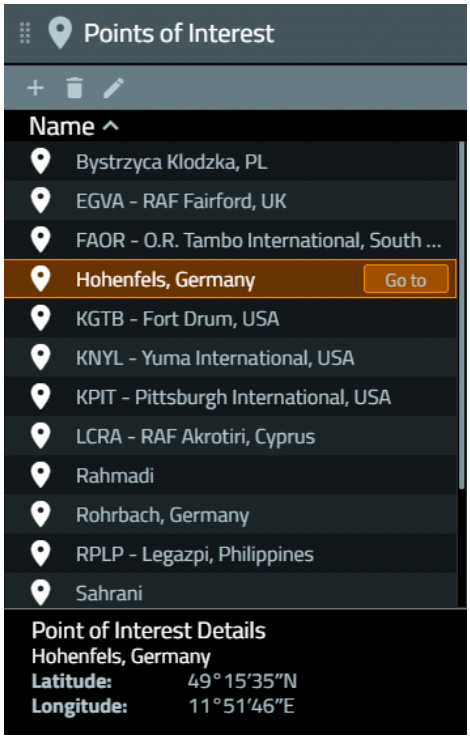
   - **POI** - Searches for the name of an existing POI.
   - **Battlespace** - Searches for the name of an existing Battlespace.
   - **Address** - Uses the VBS World Server or Google Maps Search to find the location.
   - **Lat / Long** - Uses comma-separated Latitude and Longitude coordinates to find for the location.
   - **MGRS** - Uses the MGRS coordinate system to find the location.

   A drop-down list appears with the closest matches to the data you entered in the Search Bar.
2. Click the **location** you want to use.

VBS4 finds the location, and moves to it in the Whole-Earth Terrain.

**In the Points of Interest Panel:**

- Select a POI from the list to view more information, including coordinates and Tags.



- Locate a POI in the Whole-Earth Terrain.

  Select a POI from the list and click **Go to**.
- Click the icons in the POI Toolbar to do the following:

  - Click the **Add Icon** to create a new POI.

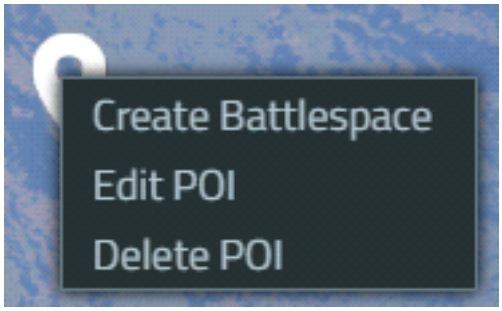
    See Create POIs (on the next page).
  - Click **Trash Icon** to delete the selected POI.

    See Delete POIs (on page 56).
  - Click **Edit Icon** to edit the selected POI.

    See Edit POIs (on page 55).

**In the Whole-Earth Terrain:**

- Place the cursor over a POI to view its name and highlight it in the POI list.
- Right-click a POI to access the available options:
  - Create Battlespaces (on page 60)
  - Edit POIs (on page 55)
  - Delete POIs (on page 56)



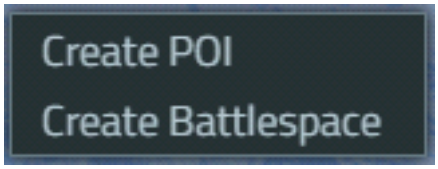

- Right-click a location to Create POIs (on the next page).

## 5.3.1 Create POIs

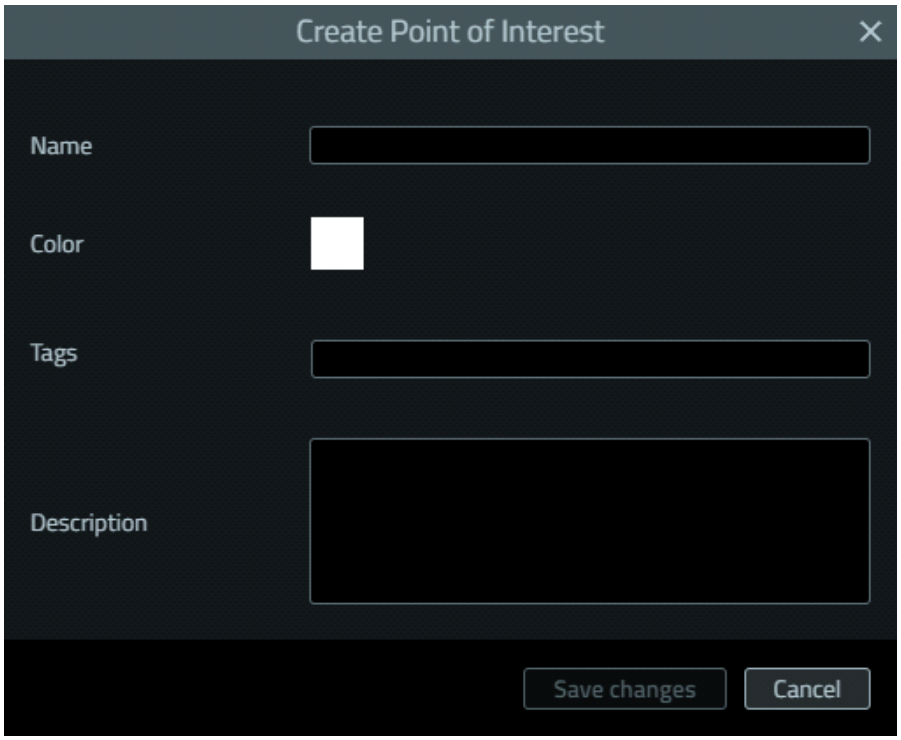
Create Points of Interest to add location bookmarks for easy navigation.

**Follow these steps:**

1. Navigate the Whole-Earth Terrain (on page 48) to display the region of interest.
2. Do any of the following:
   - In the Points of Interest Panel, click the **Add Icon**, and then click the location in the Whole-Earth Terrain.
   - In the Whole-Earth Terrain, right-click the location, and select **Create POI**.

   The Create Point of Interest dialog opens, with a default name for the location.

3. Input a **Name** for the POI.
4. Click the color box to select a custom **Color** for the POI Marker.
5. Create **Tags**, to add labels to the POI:
   - Input a Tag name and press **Comma**, **Enter**, or **Tab**. Continue typing to create another one.
   - To remove a Tag, click **X**.

6. Optional. Input a **Description** for the POI.
7. Click **Save Changes** to save the POI.

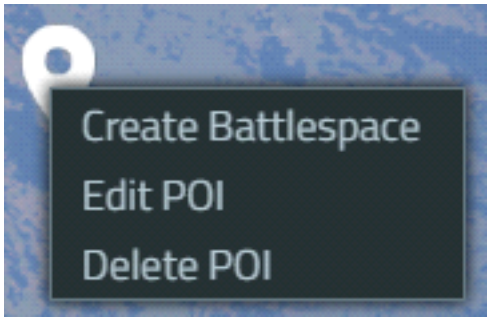
VBS4 adds the location to the POI List, and adds a POI Marker to the Whole-Earth Terrain.

## 5.3.2 Edit POIs

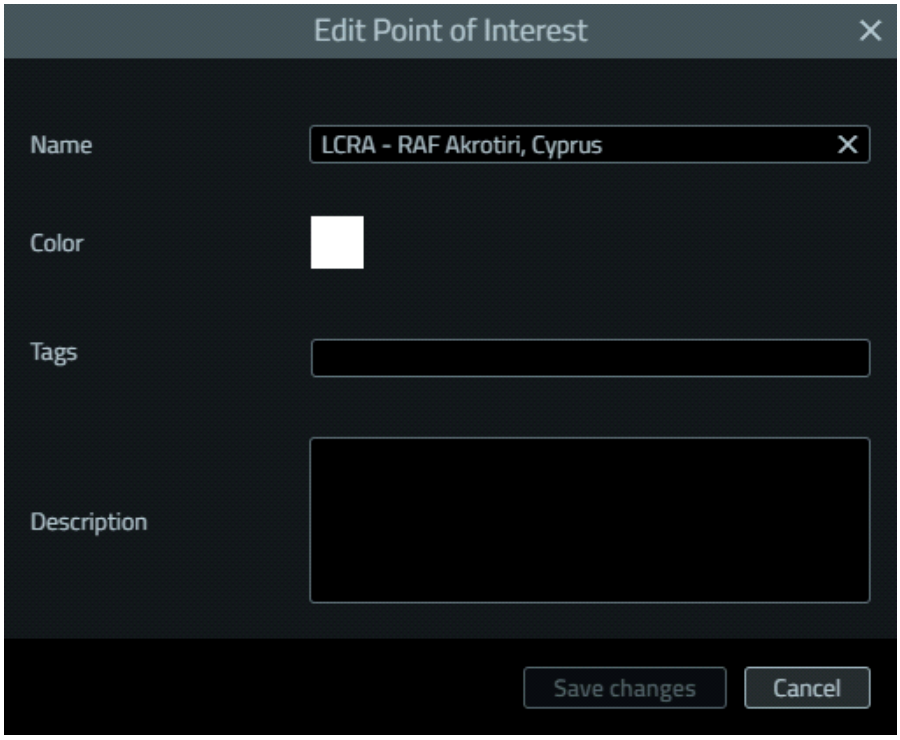
Edit POIs to modify their parameters.

**Follow these steps:**

1. Do any of the following:
   - In the Points of Interest Panel, select a POI from the list, and then click the **Edit Icon**.
   - In the Whole-Earth Terrain (on page 48), right-click the POI, and select **Edit POI**.




   The Edit Point of Interest Panel opens, with a default name for the location.




2. Input a new **Name** for the POI.

3. Click the color box to select a custom **Color** for the POI.
4. Add **Tags**, to add labels to the POI:
    - Input a Tag name and press **Comma**, **Enter**, or **Tab**. Continue typing to create another one.
    - To remove a Tag, click **X**.
5. Input a new **Description** for the POI.
6. Click **Save Changes**.

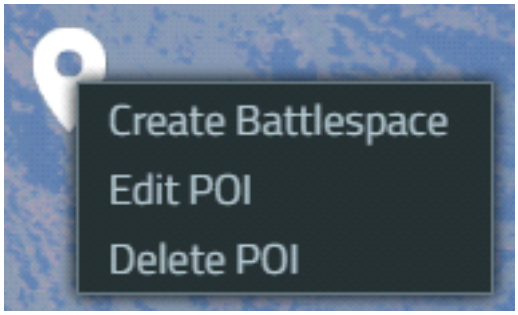
VBS4 updates the Point of Interest.

### 5.3.3 Delete POIs

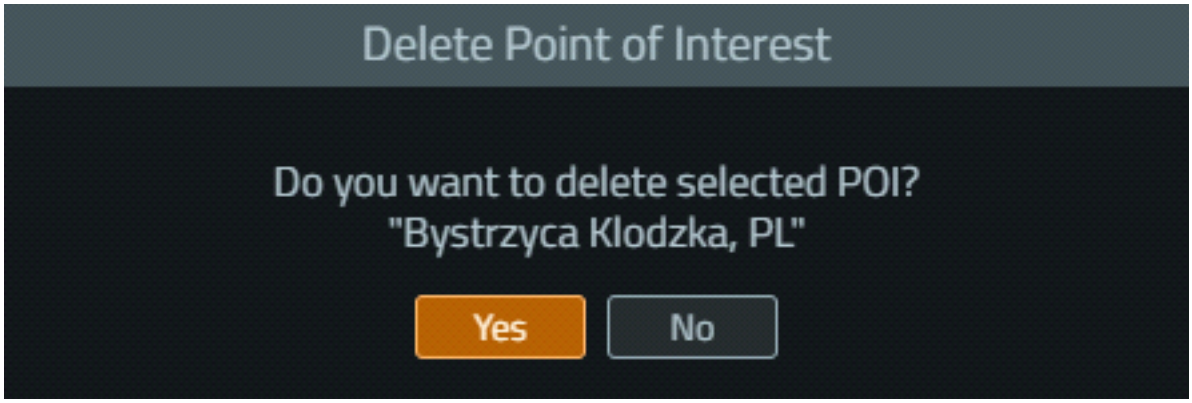
Delete POIs to remove them from the Whole-Earth Terrain, and the Points of Interest List.

**Follow this step:**

1. Do any of the following:
    - In the Points of Interest Panel, select a POI from the list, and then click the **Trash Icon**.
    - In the Whole-Earth Terrain (on page 48), right-click the POI, and select **Delete POI**.




The Delete Point of Interest dialog opens.




2. Click **Yes**.

VBS4 removes the POI from the POI List, and removes the POI Marker from the Whole-Earth Terrain.

# 6. Battlespace Management

The Battlespace is the primary organizational concept in VBS4, defining a training Scenario.

In VBS4, a Battlespace acts as a container for the following Scenario objects:

- A set of terrain edits created with VBS Geo, known as a Geo Project.
- A Tactical Plan created with VBS Plan.
- A detailed set of entities defining a Mission created with VBS Editor.

> **NOTE**
> AAR Recordings are also stored as part of the Battlespace.

Collectively, the Geo Project, the Plan, and the Mission within a Battlespace define a Scenario that meets a particular set of training use cases.

> **NOTE**
> In this release of VBS4, a Battlespace may only contain one Scenario.

The Battlespaces List in the Battlespaces tab provides the access point to create new Battlespaces and to access the editing tools required to Prepare a Scenario.

**NOTE**

The Battlespaces List displays locally saved Battlespaces and Battlespaces stored on a connected VBS World Server.

In case of Battlespace changes done outside of VBS4 (for example, copying or deleting Battlespaces), click the **Refresh Battlespaces Icon** to refresh the Battlespaces List.

**WARNING**

Avoid Battlespace changes outside of VBS4, so as not to impair the Battlespace data and folder structure (see Battlespaces Folder (on page 83)).

Use the Battlespaces List to:

- Create Battlespaces (on page 60)
- Locate a Battlespace. Select a Battlespace in the Battlespaces List, and click **Navigate**.
- Access VBS4 Functions (on page 64):
  - Modify the terrain Geo Project with VBS Geo as described in the VBS Geo Manual.
  - Create and edit Tactical Plans with VBS Plan as described in the VBS Plan Manual.
  - Create and edit Scenarios with VBS Editor as described in the VBS4 Editor Manual.
  - Execute Scenarios using your VBS4 Client as the Host, see VBS4 Client Hosted Scenario Execution (on page 95).

    Use the Training tab to Execute a Scenario for Multiplayer Training.

    For more information, see Dedicated Server Scenario Execution (on page 89).
  - Assess Scenario Execution using VBS4 After Action Review as described in the VBS4 AAR Manual.
  - Delete AAR Recordings.
- Synchronize Battlespaces (on page 68)
- Edit Battlespace Details (on page 73)
- Delete Battlespaces (on page 76)
- Filter Battlespaces (on page 80)
- Search Battlespaces (on page 82)

**WARNING**

VBS4 is a Client-Server application, where VBS4 Clients may be connected to a VBS World Server that acts as a central repository for Battlespaces and also connected to a Dedicated Server or VBS4 Host that runs the Scenario.

Different versions of the same Battlespaces can exist on the VBS World Server, VBS4 Clients, and Dedicated Servers.

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 the version on that computer. 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 any Battlespaces are overwritten, a prompt appears to notify the Administrator with an option to cancel.

The current implementation of this release of VBS4 creates the following limitations for VBS4 Client users:

- **Avoid editing the same Battlespace on two separate Clients at the same time.**

  Scenario Preparation takes place using a local copy of the Battlespace files. Synchronizing Battlespaces uploads those edits to the VBS World Server. If two Administrators edit a Battlespace at the same time, the first to upload is overwritten by the second.

- **Do not edit the terrain Geo Project for a Battlespace if there are After Action Review recordings for it.**

  Each Battlespace only supports a single Geo Project which is loaded during Scenario Execution and Scenario Assessment. Editing the terrain with VBS Geo after Scenario Execution may invalidate the AAR recording, for example by changing a flat area into a hill. The AAR package replays the movements and events that occurred when the terrain was flat, but during Playback, the hill is rendered as part of the terrain.

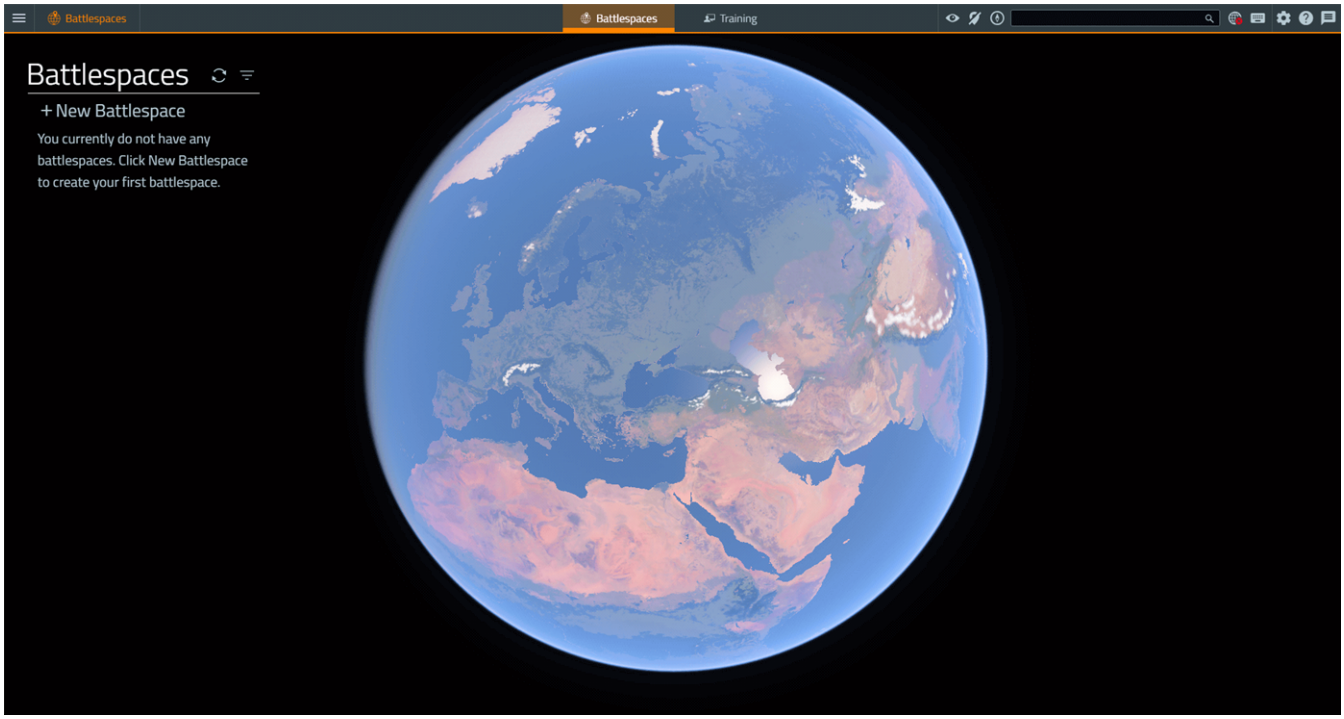
# 6.1 Create Battlespaces

All terrain edits, plan definitions, and mission edits must be contained within a defined Battlespace, so before defining a scenario you must create a Battlespace.

**Follow these steps:**

1. Start VBS4 as an Administrator.

   VBS4 starts in Battlespaces Mode, displaying the Battlespaces List and the Whole-Earth Terrain.

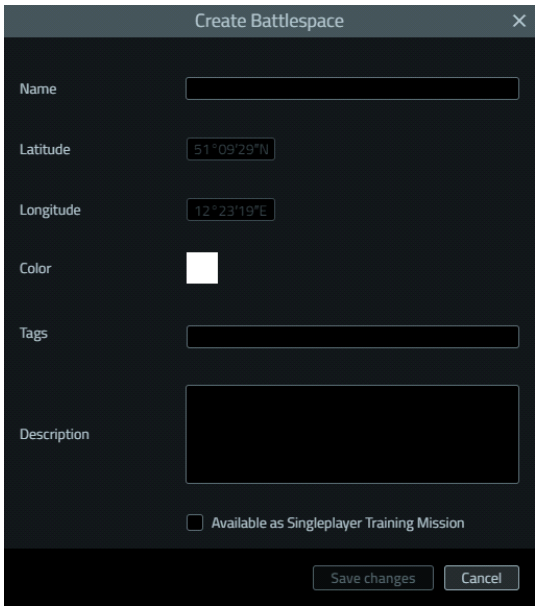


2. Do one of the following:
   - Use the Camera Controls (on page 42) to navigate the globe.

     Right-click a location, and select **Create Battlespace** from the context menu.
   - In the Battlespaces List, click **+ New Battlespace**.

     Use the Camera Controls (on page 42) to navigate the globe, and click the required location.

   The Create Battlespace dialog opens.




3. Input a **Name** for your Battlespace.

   **NOTE**

   **Latitude** and **Longitude** display the position clicked and define the center of your Battlespace, and the position of the Battlespace Marker. They cannot be changed.

4. **Optional:** Click the **Color** box and use the Color Palette dialog to specify a color for the Battlespace Marker on the Whole-Earth Terrain.
5. **Optional:** Create **Tags** to add labels for Battlespace filtering:
   - Input a Tag name and press **Comma**, **Enter**, or **Tab**. Continue typing to create another one.
   - To remove a Tag, click **X**.
6. **Optional:** Input a **Description** for your Battlespace.

7. **Optional:** Select **Available as a Singleplayer Training Mission** to make the Battlespace available to Trainees in the Training tab.

   **Optional:** Add an overview image to a Singleplayer Training Mission.

   a. Create an overview JPEG image called `overview_image.jpg`.

   > **WARNING**
   > The overview image file must be in JPEG format, and cannot have any other name.

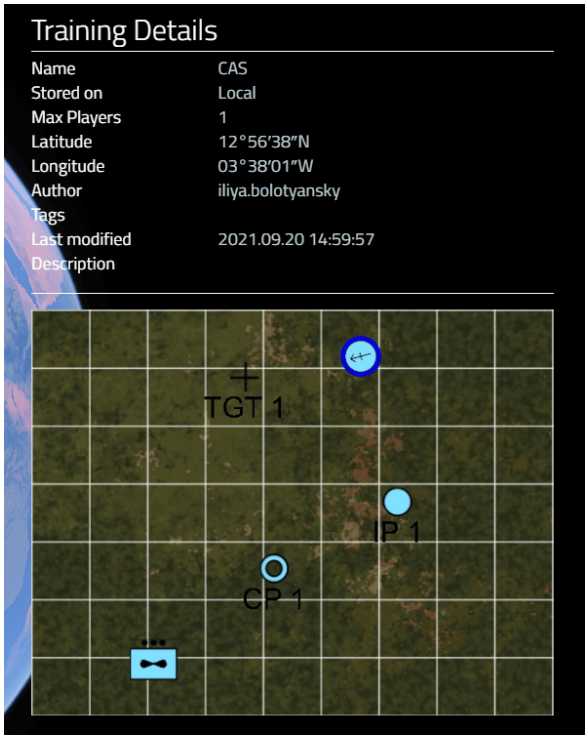
   b. Place the overview image in:

   `\Documents\VBS4\Battlespaces\Battlespace_Name\Missions\Scenario_Name\`

   c. Click the **Refresh Battlespaces Icon**.

The overview image appears in the Training Details of the Singleplayer Training Mission in the Training tab.




For more information, see Single Player Training in the VBS4 Trainee Manual.

> **NOTE**
>
> Scenarios require a playable unit before they can be Executed from the Singleplayer Battlespace list.

8. Click **Save Changes**.

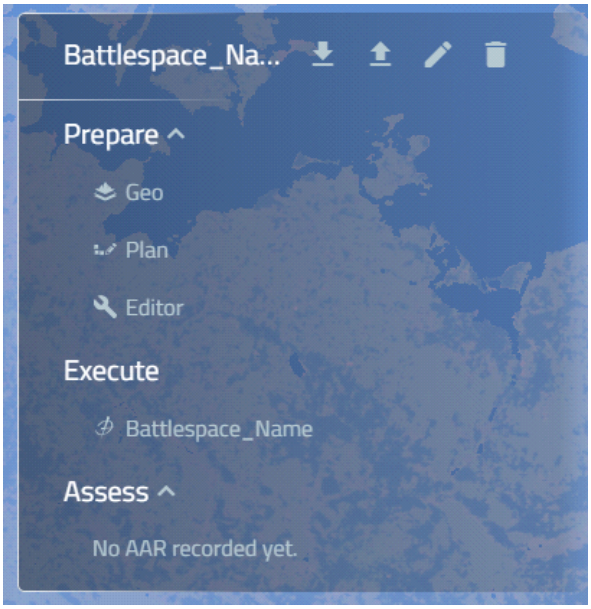
VBS4 adds the new Battlespace to the Battlespaces List, and adds a Battlespace Marker to the Whole-Earth Terrain.

Click the Battlespace name in the Battlespaces List to view or Edit Battlespace Details (on page 73), Synchronize Battlespaces (on page 68) to and from the VBS World Server, and to Access VBS4 Functions (on the next page).

# 6.2 Access VBS4 Functions

Selecting a Battlespace opens the Battlespace Functions Panel, which provides access to the primary functions of VBS4.




At the top of the Battlespace Functions Panel are the following icons:

- **Synchronization Status**

  When you are connected to VBS World Server, these icons indicate whether the local copy of the Battlespace is different to the copy on the VBS World Server.

  See Synchronize Battlespaces (on page 68).

- **Edit**

  Click the **Edit Icon** to modify the Battlespace details.

  See Edit Battlespace Details (on page 73).

- **Delete**

  Click the **Delete Icon** to remove the Battlespace.

  See Delete Battlespaces (on page 76).

Use the options under each mode to do any of the following:

- **Prepare**

  Create or modify the Battlespace Scenario.

  An overview of the Prepare workflow is described in Scenario Preparation (on page 85).

  Highlight the individual option, and click the **Create** button to work on a specific part of the Scenario:

  > **NOTE**
  > If Geo / Plan / Editor content has already been added to the Battlespace, the respective Geo / Plan / Editor button displays **Open**.

  - **Geo**

    Modify the terrain using VBS Geo.

    For details about using VBS Geo, see VBS Geo Overview in the VBS Geo Manual.

  - **Plan**

    Create or edit a tactical plan using VBS Plan.

    For details about using VBS Plan, see VBS Plan Overview in the VBS Plan Manual.

  - **Editor**

    Create or edit a mission using VBS Editor.

    For details about using VBS Editor, see VBS Editor Overview in the VBS4 Editor Manual.

- **Execute**

  Run and manage a Scenario as an Instructor using your VBS4 Admin Client to Host the Scenario. Highlight the Battlespace Scenario, and click **Host**.

  An overview of the Hosted workflow is described in VBS4 Client Hosted Scenario Execution (on page 95).

  > **NOTE**
  >
  > Use the Training tab to Execute a Scenario on a Dedicated Server.
  >
  > For more information, see Dedicated Server Scenario Execution (on page 89).

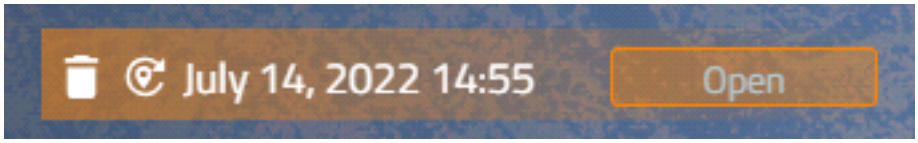
- **Assess**

  Click **Open** for an AAR Recording to start the AAR Playback and review a Scenario Execution.

  > **NOTE**
  >
  > If the AAR is only stored locally, click **Upload** to upload it to the VBS World Server, to make the AAR distribution to other VBS4 Clients possible. If the AAR is not stored locally, click **Download** to download it from the VBS World Server.

  An overview of the Assess workflow is described in Scenario Assessment (on page 101).

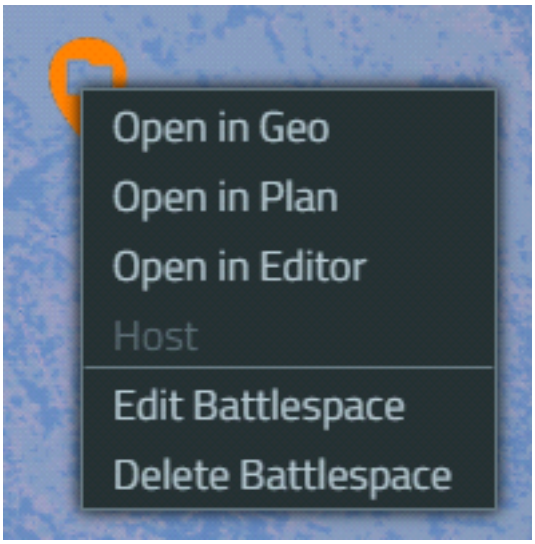
  Click the **Trash Icon** to the left of an AAR Recording name to delete it.

  For more information, see AAR Deletion (on page 78).

The **Battlespace Marker** also provides quick access to VBS4 functions.

Right-click the Battlespace Marker to view the available options:




- **Open in Geo**

  Modify the terrain using VBS Geo.

  For details about using VBS Geo, see VBS Geo Overview in the VBS Geo Manual.

- **Open in Plan**

  Create or edit a tactical plan using VBS Plan.

  For details about using VBS Plan, see VBS Plan Overview in the VBS Plan Manual.

- **Open in Editor**

  Create or edit the Scenario mission using VBS Editor in Prepare Mode.

  For details about using VBS Editor, see VBS Editor Overview in the VBS4 Editor Manual.

- **Host**

  Run and manage a Scenario as an Instructor using your VBS4 Admin Client to Host the Scenario. Highlight the Battlespace Scenario, and click **Host**.

  An overview of the Hosted workflow is described in VBS4 Client Hosted Scenario Execution (on page 95).

  > **NOTE**
  > Use the Training tab to Execute a Scenario hosted on a Dedicated Server.
  >
  > For more information, see Dedicated Server Scenario Execution (on page 89).

- **Edit Battlespace**

  Open the dialog to Edit Battlespace Details (on page 73).

- **Delete Battlespace**

  Remove all Battlespace files. For information on which files get deleted and where, see Delete Battlespaces (on page 76).

## 6.3 Synchronize Battlespaces

You can synchronize Battlespaces and AAR Recordings between your local computer and the VBS World Server.

- Battlespace Synchronization (below)
- AAR Synchronization (on page 73)

### 6.3.1 Battlespace Synchronization

Use the **Synchronize Icons** at the top of the Battlespace Functions Panel to synchronize Battlespaces, and upload / download them between the VBS World Server and your computer.

Battlespaces are always created and edited locally and can be uploaded to the VBS World Server, which allows other VBS4 Clients connected to the VBS World Server to download the Battlespaces. Your computer and the VBS World Server can have different versions of a Battlespace, and synchronization can be used to resolve the version differences.

There are three Battlespace synchronization states and **Synchronize Icons** representing them:

- There is a version of the Battlespace on your computer, which is not on the VBS World Server, or the version on the latter is different.

  In this case, the **Upload Icon** appears, which means that you can upload the Battlespace to the VBS World Server.

- There is a version of the Battlespace on the VBS World Server, which is not on your computer, or the version on the latter is different.

  In this case, the **Download Icon** appears, which means that you can download the Battlespace from the VBS World Server to your computer.

- The Battlespace versions on your computer and on the VBS World Server match.

  In this case, the **Check Mark Icon** appears, which signifies that the Battlespace on your computer is in sync with the VBS World Server.

**To synchronize Battlespaces, follow these steps:**

1. Click a **Battlespace** in the Battlespaces List, so that it is highlighted.

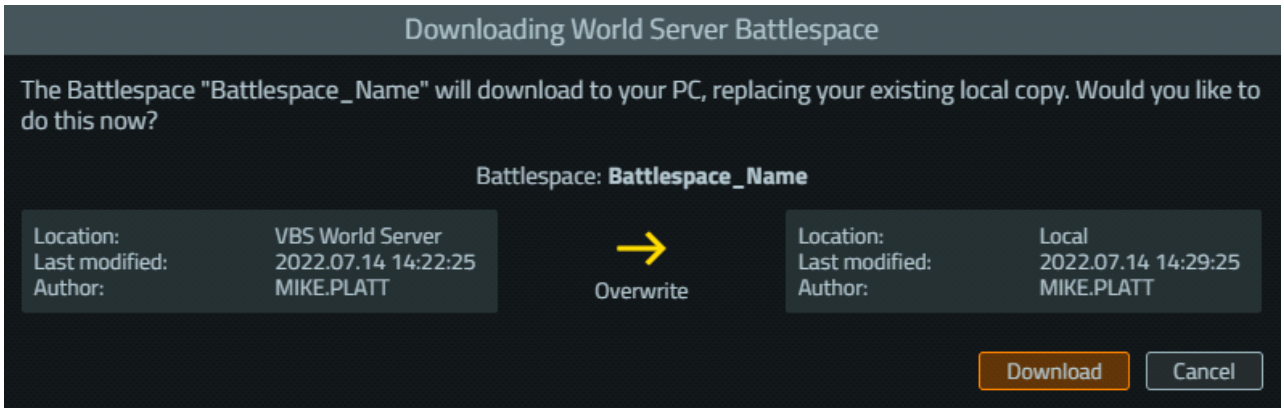
   The corresponding Battlespace Functions Panel opens.

2. Do any of the following:

   - **Download Battlespace** - Click the **Download Icon**.

     The following dialog opens:

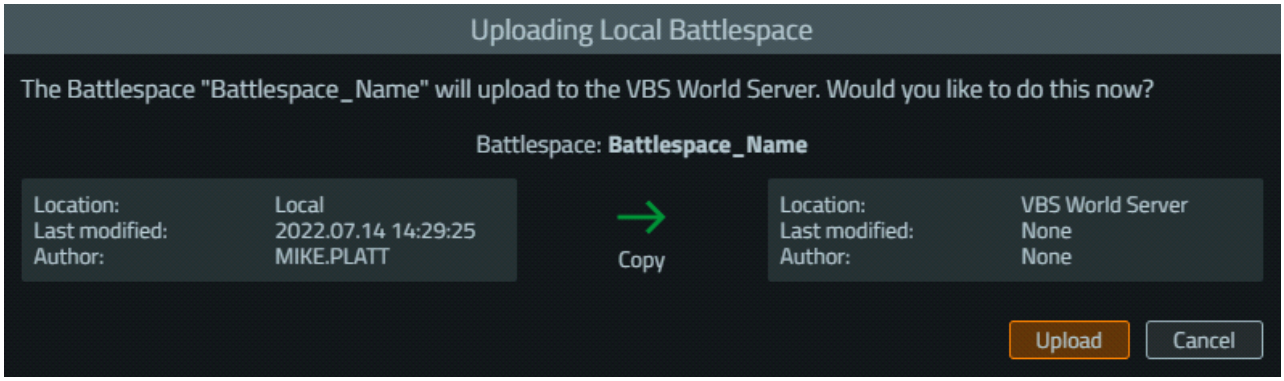
     
     

     Click **Download** to continue to download the selected Battlespace from the VBS World Server to your computer.

   - **Upload Battlespace** - Click the **Upload Icon**.

     The following dialog opens:

     Click **Upload** to continue the upload of the selected Battlespace from your computer to the VBS World Server.

When the download / upload completes, the **Check Mark Icon** appears.

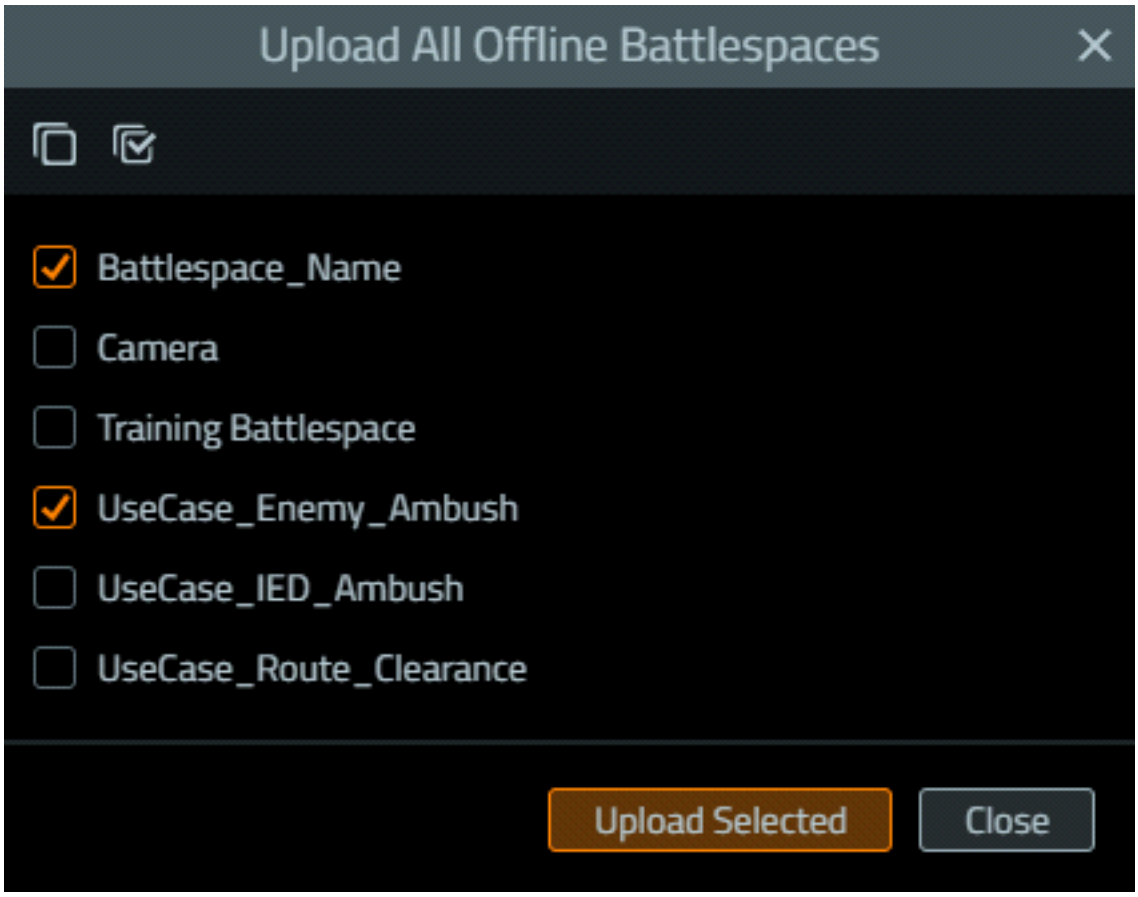
This indicates that the Battlespace version on your computer is synchronized with the Battlespace version on the VBS World Server.

Multiple Battlespaces can be uploaded to the VBS World Server at one time, using the **Upload Offline Battlespaces** option in the Main Menu, see VBS4 Main Menu (on page 36).

**Follow these steps:**

1. Click the **Main Menu**, and select **Upload Offline Battlespaces**.

   The Upload All Offline Battlespaces dialog opens.



2. Do one of the following:
   - Click **Deselect All** to deselect all Battlespaces in the list.

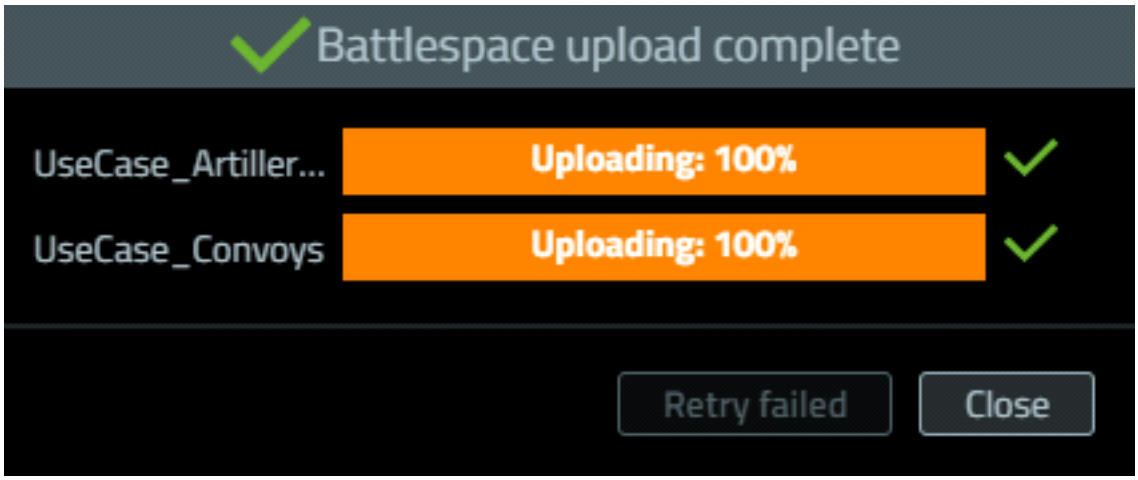
     

   - Click **Select All** to select all Battlespaces in the list.

   - Check one or more of the boxes in the list.
3. Click **Upload Selected**.

   The **Battlespace Uploading** dialog opens, showing the progress of the upload, followed by the **Battlespace Upload Complete** dialog.




4. Click **Close** to close the dialog, or click **Retry Failed** to retry uploading any Battlespaces that failed to upload.

The Battlespaces are uploaded to the VBS World Server.

> **NOTE**
>
> Battlespaces on, or downloaded to your computer are stored in the Battlespaces Folder (on page 83).

## 6.3.2 AAR Synchronization

You can synchronize AAR Recordings between your local computer and the VBS World Server.

AAR Recordings are saved on the VBS4 Admin Client that performs the save action in VBS Editor, and can be uploaded to the VBS World Server, which allows other VBS4 Clients connected to the VBS World Server to download them.

**Follow these steps:**

1. Click a **Battlespace** in the Battlespaces List, so that it is highlighted.

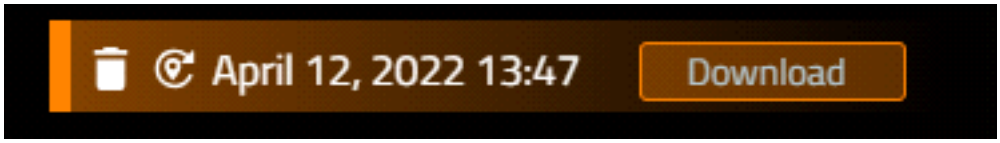
   The corresponding Battlespace Functions Panel opens.

2. Expand **Assess**, and do one of the following:

   - **AAR Upload** - The AAR Recording is not on the VBS World Server. Click **Upload** to upload it to the VBS World Server.

   - **AAR Download** - The AAR Recording is on the VBS World Server, but not available locally. Click **Download** to download it to your computer.

## 6.4 Edit Battlespace Details

Select a Battlespace to view and modify its details.

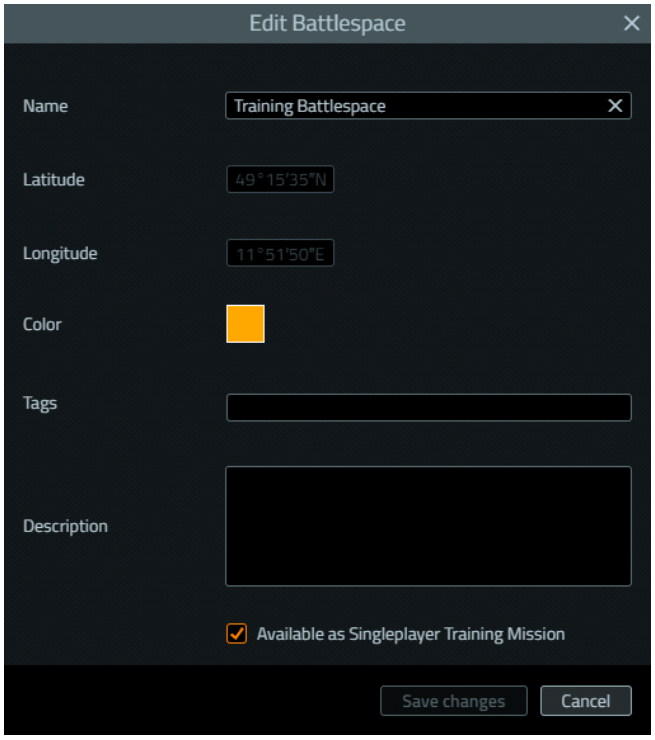
**Follow these steps:**

1. Click a **Battlespace** in the Battlespaces List, so that it is highlighted.

   The corresponding Battlespace Functions Panel opens.

2. Click the **Edit** icon at the top of the dialog.

The Edit Battlespace dialog opens.




> **NOTE**
>
> To modify **Max Players** (the number of playable characters in the Scenario), use VBS Editor (see Open in Editor (on page 67)) to add playable entities.
>
> If the Scenario has no playable entities, **Max Players** is not listed in Battlespace Details.

3. Modify the **Name** and **Description** as required.

> **NOTE**
>
> **Latitude**, **Longitude** cannot be changed.

4. Click the **Color Box** to change the color of the Battlespace Marker in the Whole-Earth Terrain.
5. Add Tags to add labels for Battlespace filtering:
   - Input a Tag name and press **Comma**, **Enter**, or **Tab**. Continue typing to create another one.
   - To remove a Tag, click **X**.

6. **Optional:** Select **Available as a Singleplayer Training Mission** to make the Battlespace available to Trainees in the Training tab.

   **Optional:** Add an overview image to a Singleplayer Training Mission.

   a. Create an overview JPEG image called `overview_image.jpg`.

   > **WARNING**
   > The overview image file must be in JPEG format, and cannot have any other name.

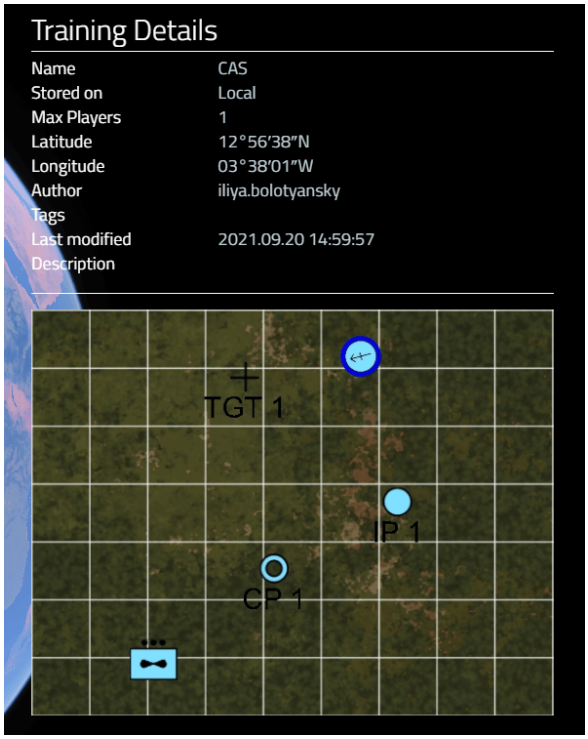
   b. Place the overview image in:

   `\Documents\VBS4\Battlespaces\Battlespace_Name\Missions\Scenario_Name\`

   c. Click the **Refresh Battlespaces Icon**.

The overview image appears in the Training Details of the Singleplayer Training Mission in the Training tab.




For more information, see Single Player Training in the VBS4 Trainee Manual.

> **NOTE**
>
> Scenarios require a playable unit before they can be Executed from the Singleplayer Battlespace list.

7. Click **Save Changes**.

VBS4 updates the Battlespace and updates the **Author** to display the last user to modify the Battlespace.

> **TIP**
>
> You can change the name of a local Battlespace by directly modifying the following:
>
> - The Battlespace folder name:
>
>   `\Documents\VBS4\Battlespaces\name\`
> - The Mission folder name:
>
>   `\Documents\VBS4\Battlespaces\name\Missions\name\`
> - The following elements in the `battlespace.json` file at:
>
>   `\Documents\VBS4\Battlespaces\name\battlespace.json`
>
>   - `"id" : "name"`
>   - `"displayName" : "name"`
>
> Make sure that every instance of the Battlespace *name* is identical.

## 6.5 Delete Battlespaces

Deleting a Battlespace removes the Battlespace, and all items associated with it, from VBS4.

The following is discussed:

- Battlespace Deletion (on the next page)
- AAR Deletion (on page 78)

## 6.5.1 Battlespace Deletion

This section describes how to delete a Battlespace, and what happens when a Battlespace is deleted.

**WARNING**

The following Battlespace deletion considerations apply:

- If you delete a Battlespace, and are connected to the VBS World Server, you can optionally delete the Battlespace from the VBS World Server as well.
- If you manually modify the `\WS_Installation\data\Battlespaces\` folder by copying, deleting, or renaming Battlespaces, then you must also delete the following folder:

  `\WS_Installation\Services\VBS4\cache\`

  Not deleting the `\cache\` folder may significantly affect VBS World Server performance.
- If the Battlespace (or its copy) is stored on a Dedicated Server, it has to be deleted manually on the Dedicated Server computer from:

  `\Documents\VBS4\Battlespaces\Battlespace_Name\`

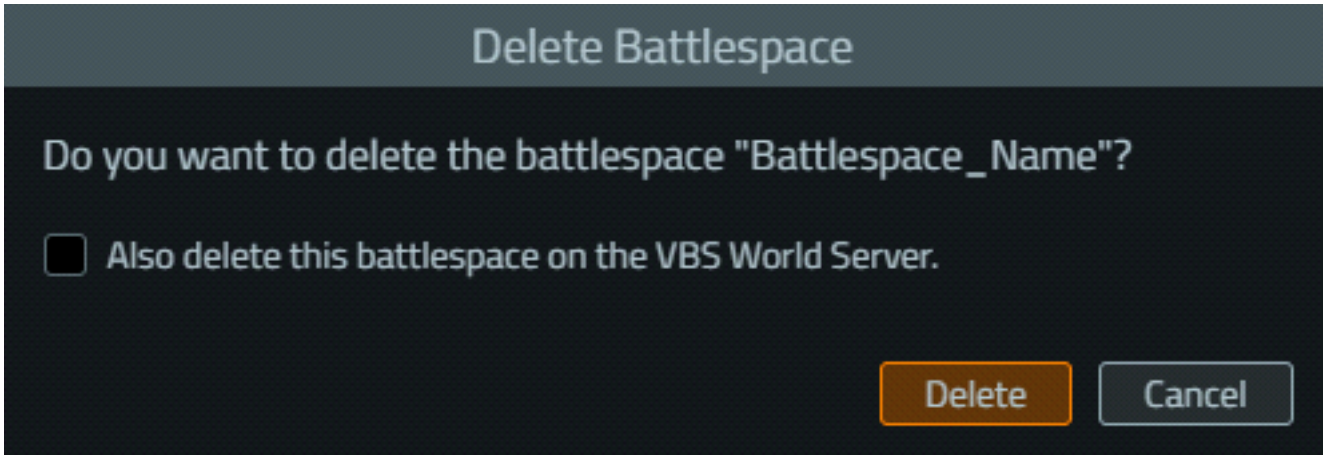
**Follow these steps:**

1. Click a **Battlespace** in the Battlespaces List, so that it is highlighted.

   The corresponding Battlespace Functions Panel opens.

2. Click the **Trash Icon** at the top of the dialog.

The Delete Battlespace dialog opens.




3. If connected to a VBS World Server, where a copy of the Battlespace is also present, optionally select **Also delete this battlespace on VBS World Server** to delete that copy of the Battlespace as well.
4. Click **Delete**.

VBS4 removes the Battlespace from the Battlespaces List, and removes the Battlespace Marker from the Whole-Earth Terrain.

## 6.5.2 AAR Deletion

This section describes how to delete an AAR Recording of a Battlespace, and what happens when the AAR Recording is deleted.

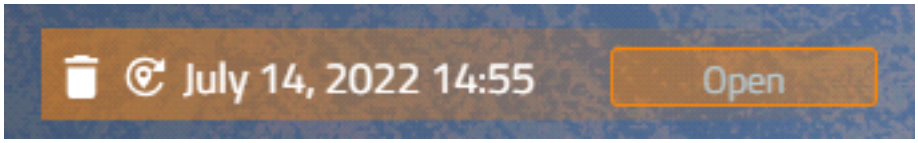
**Follow these steps:**

1. Click a **Battlespace** in the Battlespaces List, so that it is highlighted.

   The corresponding Battlespace Functions Panel opens.
2. Expand **Assess** and highlight the AAR Recording you want to delete.

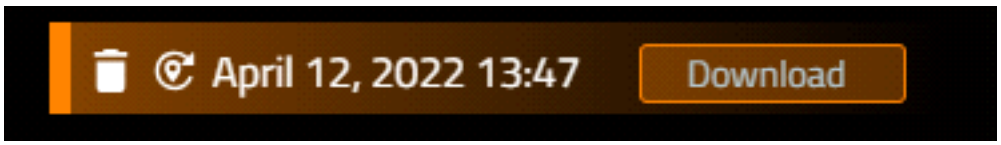
3. Click the **Trash Icon** to delete the AAR Recording.

   If your VBS4 Admin Client is not connected to the VBS World Server, the following is displayed:




   If your VBS4 Admin Client is connected to the VBS World Server and the AAR Recording is present locally on your VBS4 Admin Client, the following is displayed:


   If your VBS4 Admin Client is connected to the VBS World Server and the AAR Recording is only stored on the VBS World Server, the following is displayed:




   **WARNING**

   The following AAR Recording deletion considerations apply:

   - When deleting the AAR Recording from an VBS4 Admin Client while connected to the VBS World Server, a prompt appears to optionally delete the AAR Recording on the VBS World Server as well.
   - When deleting the AAR Recording from an VBS4 Admin Client while not connected to the VBS World Server, the deletion only occurs on the VBS4 Admin Client.

# 6.6 Filter Battlespaces

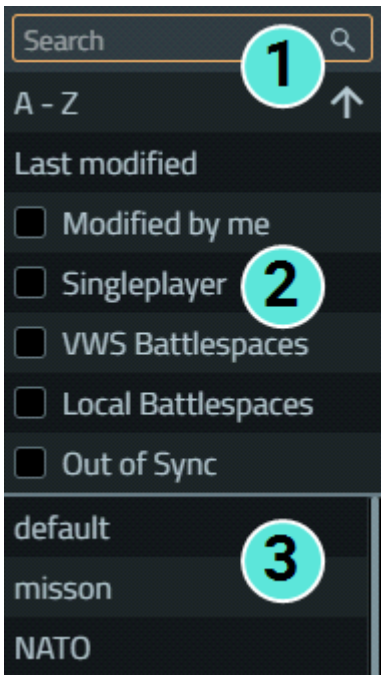
Filter Battlespaces to narrow down the options in the Battlespaces List.

**Follow these steps:**

1. Click the **Filter Icon**.

   The filter dialog opens.

2. Use the following filters:

| | |
|---|---|
| 1 | Search field that allows you to search for specific Battlespaces that meet the search criteria, based on partial name and Tag (see Create Battlespaces (on page 60)). Multiple tags can be separated by commas. |
| 2 | The following filters options are available:<br>• **A - Z** - Click to sort the Battlespaces in ascending / descending alphabetical order.<br>• **Last modified** - Click to display only the last modified Battlespaces.<br>• **Modified by me** - Check to display the Battlespaces modified by you in ascending / descending modification timestamp order.<br>• **Singleplayer** - Check to display the Battlespaces that, apart from Multiplayer, are also available in Singleplayer.<br>For more information, see Single Player Training in the VBS4 Trainee Manual.<br>• **VWS Battlespaces** - Check to the display the Battlespaces that are available on the VBS World Server, when connected to it.<br>• **Local Battlespaces** - Check to display the Battlespaces that are not available on the VBS World Server, when connected to it. These Battlespaces are only found on your local computer.<br>• **Out of Sync** - Check to display the Battlespaces that need uploading to the VBS World Server, when connected to it. These Battlespaces are either missing on the VBS World Server or have a version of the Battlespace which is missing on the VBS World Server.<br>For more information, see Synchronize Battlespaces (on page 68). |
| 3 | Available Battlespaces Tags.<br>Click a Tag to display all the Battlespaces that have it.<br>**TIP**<br>Click multiple Tags to add them to the Search field, separated by commas. |

**NOTE**

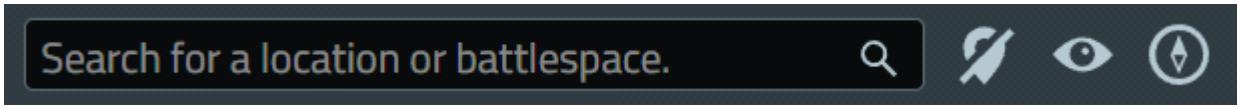
When any of the filters are used, the **Filter Icon** changes to orange.

# 6.7 Search Battlespaces

Search for a Battlespace, using the Search Bar in the VBS4 Toolbar.

**Follow these steps:**

1. Go to the Search Bar.




2. Enter the **name** of the Battlespace you are looking for (partial word search is possible).

   The results are displayed in a drop-down list in the following order:

   - Battlespaces
   - POIs
   - VBS World Server Data (if you are connected to the VBS World Server.)
   - Google Maps locations (if you are not connected to the VBS World Server, but are on-line.)

3. Click a **Battlespace** in the list.

VBS4 finds the location, and moves to it in the Whole-Earth Terrain. In addition, the selected Battlespace is highlighted in the Battlespaces List.

# 6.8 Battlespaces Folder

In VBS4, all files associated with a Battlespace are stored locally and, when connected, can be uploaded to the VBS World Server for ease of access to all connected clients.

When a Battlespace is created, VBS4 creates a local Battlespace folder in your default Windows `\Documents\` folder:

`\Documents\VBS4\Battlespaces\Battlespace_Name\`

This folder contains a `battlespace.json` file containing the Battlespace details specified during Create Battlespaces (on page 60) and updates this file whenever an Administrator wants to Edit Battlespace Details (on page 73).

Whenever a VBS4 Admin Client saves a Battlespace during Prepare Mode, VBS4 creates the following folder structure:

`\Battlespace_Name\`

- `Geo\`

  Contains the terrain edits from VBS Geo as a Geo Project file, `geoproject.geo`.

- `Missions\`
  - `Scenario_Name\`

    Contains the Scenario edits from VBS Plan and VBS Editor, optional customization of the map layers (see Custom Map Layers in the VBS4 Editor Manual), and an optional Scenario overview JPEG image for Single Player Training (see the VBS4 Trainee Manual), in a specific Scenario folder.

    > **NOTE**
    >
    > In this release, each Battlespace only contains one Scenario, and *Scenario_Name* is the same as *Battlespace_Name*.

    - `briefings\`

      Contains Mission Briefings and a `\data\` folder, which contains images / PDF files related to the Mission Briefings. For more information, see Edit the Mission Briefing in the VBS4 Editor Manual.

If you are connected to VBS World Server and upload a Battlespace, it also creates a Battlespace folder on the VBS World Server:

`\WS_Installation\data\Battlespaces\Battlespace_Name\`

**WARNING**

The following Battlespace deletion considerations apply:

- If you delete a Battlespace, and are connected to the VBS World Server, you can optionally delete the Battlespace from the VBS World Server as well.
- If you manually modify the `\WS_Installation\data\Battlespaces\` folder by copying, deleting, or renaming Battlespaces, then you must also delete the following folder:

  `\WS_Installation\Services\VBS4\cache\`

  Not deleting the `\cache\` folder may significantly affect VBS World Server performance.
- If the Battlespace (or its copy) is stored on a Dedicated Server, it has to be deleted manually on the Dedicated Server computer from:

  `\Documents\VBS4\Battlespaces\Battlespace_Name\`

During Scenario Execution, if an Instructor records and saves an After Action Review, VBS4 creates the following folder structure on the VBS World Server or Dedicated Server running the Scenario:

`\Battlespace_Name\`

- `AAR\`
  - `timestamp.AAR_Name\`

This folder contains the same structure as the local folder and also stores AAR Recordings made while connected to a VBS World Server.

The Battlespaces and AAR recordings on a connected VBS World Server are available to all connected VBS4 Admin Clients for Scenario Preparation (on the next page), Scenario Execution (on page 89), and Scenario Assessment (on page 101).

VBS4 enables you to synchronize local and VBS World Server copies of the same Battlespace. For more information, see Synchronize Battlespaces (on page 68).

# 7. Scenario Preparation

The primary VBS4 use case is the creation of engaging and realistic training Scenarios.

Create a Battlespace, and use VBS Geo, VBS Plan, and VBS Editor to create your Scenario.

**Follow these steps:**

1. Use VBS Launcher to start a VBS4 Client as an Administrator 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 a VBS World Server.

     > **WARNING**
     > Do not select or input the **Server IP** Address to connect to a Dedicated Server.

   - Select **admin**.

2. To enable additional options for Scenario Preparation, select the following in VBS Launcher:

   **Server > gateway** (`-gateway`)

   Enables the **Tools > Gateway GUI** options to configure VBS Gateway and Entity Mapping.

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

   For more information, see Starting VBS4 in the VBS4 Administrator Manual.

3. Click **Launch Modules**.

   VBS4 starts in Battlespaces mode.

4. Create a Battlespace in the Whole-Earth Terrain:

   a. Select the **Battlespaces** tab, and in the Battlespaces List, click **+ New Battlespace**.

   b. Use the Orbit Camera Controls to navigate the globe and click the required location.

   c. Input the Battlespace details and click **Save Changes**.

   VBS4 adds the new Battlespace to the Battlespaces List, ready for Scenario Preparation.

   For more information, see Create Battlespaces (on page 60).

5. Select your Battlespace in the Battlespaces List and use any of the **Prepare** functions in the Battlespace Functions Panel:
   - Highlight **Geo** and click **Create** to use VBS Geo to modify the terrain for your Scenario.

     For details about editing the terrain, see VBS Geo Overview in the VBS Geo Manual.
   - Highlight **Plan** and click **Create** to use VBS Plan to quickly populate your Scenario with ORBATs and define Tactical Plans.

     For details about creating Plans, see VBS Plan Overview in the VBS Plan Manual.
   - Highlight **Editor** and click **Create** to use VBS Editor to perform individual entity and detail level modifications in your Scenario.

     For details about creating missions, see VBS Editor Overview in the VBS4 Editor Manual.

   **NOTE**

   VBS4 opens the local copy of the Battlespace. To use a Battlespace saved on VBS World Server, synchronize it first. For more information, see Synchronize Battlespaces (on page 68).

   The VBS4 UI switches to Prepare Mode, opens the selected Tool, and displays the Tool Selection (on page 37) options in the VBS4 Toolbar.

   Click **Plan**, **Editor**, or **Geo** in the VBS4 Toolbar to switch seamlessly between the VBS4 Tools in Prepare Mode.

   **WARNING**

   VBS4 requires a playable character in the Scenario to enable Preview and Scenario Execution.

   Do one of the following:
   - Add a playable character in VBS Editor.

     For more information, see Adding Units in the VBS4 Editor Manual.
   - Specify a playable unit in VBS Plan and click **Build Mission**.

     For more information, see Tactical Unit Tool and Build Missions in the VBS Plan Manual.
6. To setup VBS Radio as part of your Scenario:
   - Select **Editor** and **Tools > Radio Admin** to configure the Channels, Radio Types, and Assignments.

   For more information, see Setting Up VBS Radio in the VBS Radio Manual.

7. 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.

   For more information, see VBS Gateway UI in the VBS Gateway Manual.
8. To configure IG View Objects to broadcast viewpoints to VBS Blue IG, see Add IG Viewpoints to Scenarios in the VBS4 Editor Manual.
9. To preview your mission, click the **Preview** button in the VBS4 Toolbar of any of the Tools.

   The Scenario starts as a playable mission with you controlling the first playable character placed in the Scenario.
   - Play the Scenario as a Trainee to preview the Scenario in action.

     For information about controlling your character, see the VBS4 Trainee Manual.
   - Modify the Scenario as an Instructor to play test various aspects of the Scenario.

     Press **Map** (**M**) or **Pause** (**Esc**), and select **Editor** to open VBS Editor in Preview Mode.

     Preview Mode provides the majority of the same VBS Editor functions as Execute Mode.

     For more information, see Instructor Interface in the VBS4 Instructor Manual.

     > **NOTE**
     > Any changes made to the Scenario during the Preview only persist for the duration of the Preview and are not saved as part of the Battlespace.
   - Restart the Scenario as an Instructor.

     Press **Pause** (**Esc**) and in the **Main Menu** in the VBS4 Toolbar, select **Restart Battlespace**.
   - Return to the Editor UI in Prepare Mode to continue editing the Scenario.

     Press **Pause** (**Esc**) and in the **Main Menu** in the VBS4 Toolbar, select **End Battlespace**.
   - Open the Config Browser.

     Press **Pause** (**Esc**) and in the **Main Menu** in the VBS4 Toolbar, select **Config Browser**.

10. To save your Scenario, click the **Main Menu** in the VBS4 Toolbar, and under **Battlespaces** select one of the following options:
    - **Save** - Saves changes into the currently open Battlespace.
    - **Save As** - Creates a new Battlespace, or overwrites the existing one, based on the name you enter in the dialog.

VBS4 saves the Battlespace locally, creating and updating the files described in Battlespaces Folder (on page 83).

When you are connected to VBS World Server, you are given the option to upload the Battlespace to the VBS World Server. For more information see Synchronize Battlespaces (on page 68).

A scenario saved to VBS World Server is available for use on all connected Clients:

- Modify the Scenario using the same process described in this topic.
- Execute the Scenario as described in Scenario Execution in the VBS4 Instructor Manual.

**WARNING**

**Current Limitations**

In this release of VBS4, the following limitations apply during Scenario Preparation:

- **Avoid editing the same Battlespace on two separate Clients at the same time.**

  Scenario Preparation takes place using a local copy of the Battlespace files. Synchronizing Battlespaces uploads those edits to the VBS World Server. If two Administrators edit a Battlespace at the same time, the first to upload is overwritten by the second.

- **Do not edit the terrain Geo Project for a Battlespace if there are After Action Review recordings for it.**

  Each Battlespace only supports a single Geo Project which is loaded during Scenario Execution and Scenario Assessment. Editing the terrain with VBS Geo after Scenario Execution may invalidate the AAR recording, for example by changing a flat area into a hill. The AAR package replays the movements and events that occurred when the terrain was flat, but during Playback, the hill is rendered as part of the terrain.

For a demonstration of a simple Scenario, see the VBS4 Instructor Series - CQB Squad Training and video at https://youtu.be/JcnJseLQ8zs.

**NOTE**

The videos may not be up to date with the features they demonstrate, the latest state of which is described in this manual.

# 8. 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 95)

Trainees and additional Administrators join the scenario:

- Connecting Trainee Clients (on page 98)

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

- Managing the Scenario (on page 99)

## 8.1 Dedicated Server Scenario Execution

The Dedicated Server Workflow enables VBS4 to host a scenario using a VBS4 installation 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 use the **Online** option connected to the same VBS World Server (`-worldServer=VWS_ipaddress_or_dnsname`)
- **Offline:** When a VBS World Server is not required, all computers must use the **Offline** option (`-worldServer` not specified).

**Follow this process:**

1. Start the Dedicated Server (on the next page)
2. **Optional:** Start Simulation Clients (on page 91)
3. Start an Admin Client (on page 92)

4. Start the Battlespace (on page 93)
5. Connect the Trainees and Start the Scenario (on page 94)

### 8.1.1 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.

## 8.1.2 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.
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.

## 8.1.3 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 in the VBS4 Instructor Manual.
- 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 **Become Server Admin** option.

## 8.1.4 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:

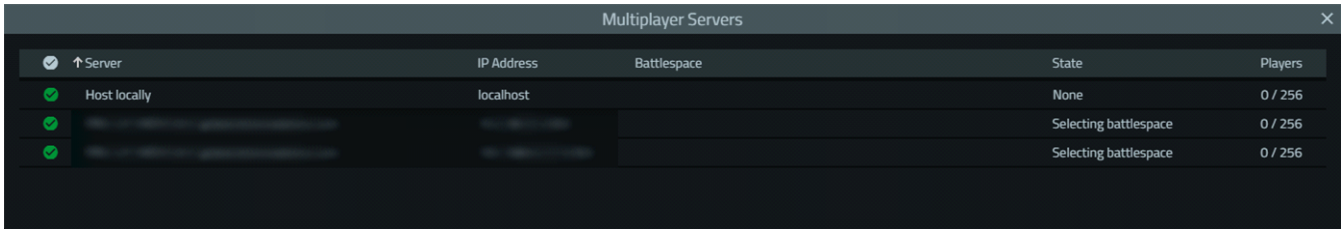
- If the VBS World Server version is used, it downloads to the VBS4 Admin Client and uploads to the Dedicated Server, overwriting any versions on those computers.
- If the local VBS4 Admin Client version is used, it uploads to the Dedicated Server, overwriting the version on that computer. The VBS World 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 any Battlespaces are overwritten, a prompt appears to notify the Administrator 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.



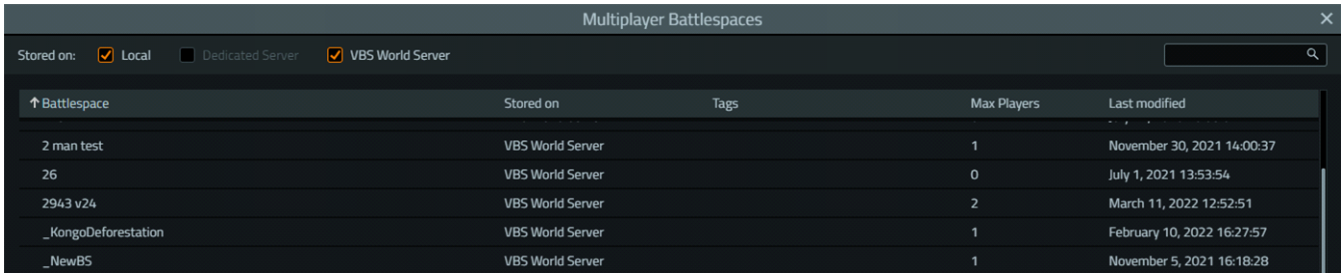

2. Select the Dedicated Server that hosts the Scenario, and click **Connect**.

**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.

## 8.1.5 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 98).

2. In the Network Lobby, 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.

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.

## 8.2 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 (on page 68).

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.

   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, 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.

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.

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

**Follow these steps:**

1. Start VBS4 on the VBS4 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.

## 8.4 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:

- Mission Scenario Administration

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

- Mission Scenario Monitoring

  Monitor and visualize specific aspects of a Scenario Execution.

- Event Management

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

- Entity Management

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

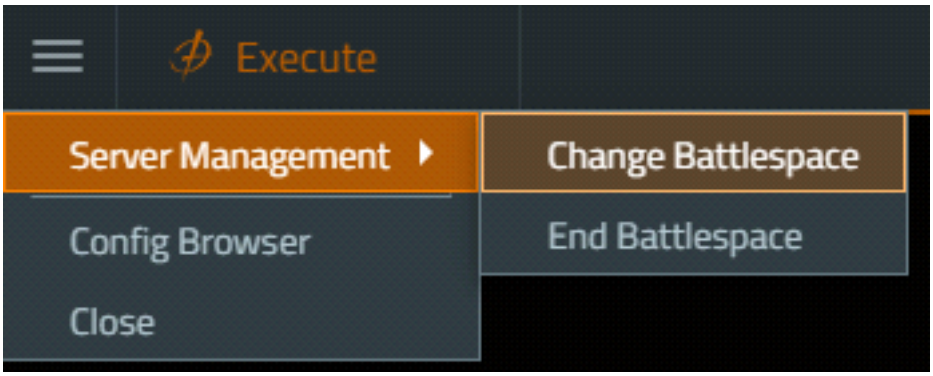
> **NOTE**
>
> The VBS4 Instructor Manual focuses only on specific functionality that is only available in Execute Mode.
>
> The majority of the Prepare Mode functionality of VBS Editor and VBS Plan is also available for use in Execute Mode. For more information, see:
>
> - VBS Plan Overview in the VBS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

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

- Monitoring VBS Radio
- Monitoring with VBS Gateway

For more information, see the topics in the VBS4 Instructor Manual.

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




- **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.

# 9. Scenario Assessment

One of the primary VBS4 use cases is the recording, playback, and review of training scenarios.

Use VBS4 to record and review your training scenarios with playback control over viewpoints, overlays, and event review to enable full evaluation of trainee behavior.

During Scenario Execution, the Instructor can record the Scenario as described in Recording Scenarios for AAR in the VBS4 Instructor Manual.

These After Action Review (AAR) recordings are saved on the VBS4 Admin Client, and can be uploaded to the VBS World Server to provide access on all connected Clients. For more information, see Synchronize Battlespaces (on page 68).

**Follow these steps:**

1. Start VBS4 as an Administrator 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 a VBS World Server.

     > **WARNING**
     > Do not select or input the **Server IP** Address to connect to a Dedicated Server.

   - Select **admin**.
   - If you plan to use AAR Streaming, do not disable VBS Radio (`-disableVBSRadio`).

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

   For more information, see Starting VBS4 in the VBS4 Administrator Manual.

2. Select the Battlespace in the Battlespaces List:
    - **Online** - The **Assess** section of the Battlespace Functions Panel displays the AAR recordings saved on your VBS4 Client and on the VBS World Server. Click **Download** to copy an AAR recording from VBS World Server to your VBS4 Client.
    - **Offline** - The **Assess** section of the Battlespace Functions Panel displays the AAR recordings saved on your VBS4 Client.
3. Highlight the recording to playback, and select **Open**.

    The AAR UI opens.


Use the AAR UI controls to perform the following actions described in the VBS4 AAR Manual:

- To control the scenario playback, see AAR Playback and the User Interface.
- To access VBS Plan recordings, see VBS Plan in AAR.
- To access statistical data, see Event Log and Advanced Statistics.
- To review Radio recordings, see VBS Radio Playback in AAR.
- To review VBS Call for Fire recordings, see VBS Call for Fire in AAR.
- To stream an AAR recording to Trainee computers, see .

**NOTE**

To delete an AAR Recording, highlight it in the **Assess** section of the Battlespace Functions Panel, and click the **Trash** icon. If you are connected to the VBS World Server, the AAR Recording is deleted from there also.

# 10. VBS Components and Products

VBS4 includes additional component functionality that enhances the **Prepare** - **Execute** - **Assess** workflow.

**TIP**

The use of these components is described in the applicable parts of the VBS4 Manuals based on their roles in the Prepare - Execute - Assess workflow, but for convenience, standalone documentation for these components is also available in:

`\VBS_Installation\docs\PDF\Components\`

**VBS Call for Fire**

Enables Forward Observer (FO) units to practice the correct procedures and event sequences when requesting fire power.

For more information, see VBS Call for Fire Overview (on page 107).

**VBS Control AI**

Provides a set of AI behaviors with Computer Generated Forces (CGF)-like capabilities.

For more information, see VBS Control AI Overview (on page 135).

**VBS Gateway**

Provides a DIS / HLA link between VBS4 and other simulations for distributed training exercises.

For more information, see VBS Gateway Overview (on page 137).

**VBS Host**

Broadcast specified viewpoints to VBS Blue IG.

For more information, see VBS Host Overview (on page 140).

**VBS Radio**

Simulates radio and other communication within VBS4 and as part of larger cross-product integrations.

For more information, see VBS Radio Overview (on page 141).

**VBS Mixed Reality**

The mixed reality functionality allows trainees using VBS4 to interact with real equipment inside a synthetic scenario.

For more information, see Mixed Reality: Overview in the VBS4 Administrator Manual.

**Config Patch Builder**

Enables users to modify model asset parameters and values, such as the maximum speed of a vehicle, and deploy them to VBS as `.pbo` patch files. Users require no in-depth understanding of configuration file writing, configuration syntax, or other technical knowledge to make updates and generate the .pbo files.

For more information, see Config Patch Builder in the VBS4 Administrator Manual.

## 10.1 VBS Bundle

VBS Bundle is a collection of additional features that are not available in baseline VBS4, but are available with additional licensing, to enhance its functionality.

**VBS Close Air Support**

VBS Close Air Support provides simulated Close Air Support (CAS) using VBS Plan.

CAS simulation involves coordination between the Instructor, who prepares and executes the CAS scenario, and the Joint Terminal Attack Controller (JTAC) Trainee (also known as Forward Air Controller (FAC)), who directs the aircraft through communication with the Instructor, typically using VBS Radio.

For more information, see VBS Close Air Support (on page 115).

**VBS Radio Pro**

Adds support for unlimited radio channels and types.

Configurable radio network presets, enabling users to customize channel names, colors, icons and enable saving and loading of radio networks per mission.

Radio degradation that can also be influenced by weather, distance and terrain obstruction.

Includes Radio Antennas and Jammers to provide realistic radio ranges and jamming capabilities.

For more information, see VBS Radio Overview (on page 141).

**Overlay Sharing in VBS Plan**

Overlay sharing allows users to share VBS Plan drawings to other VBS4 users on the network. This allows different planning *cells* to draw plan layers and submit them to create collaborative drawings quickly.

For more information, see Share Overlays - Network Collaboration in the VBS Plan Manual.

**Microsoft Bing Terrain Data Support**

Bing support allows customers to use their own Microsoft Bing API* key to stream Bing data into VBS4. This provides high detail Bing map satellite and 3D photogrammetry data that can be directly used in simulation.

> **NOTE**
> The API key must be acquired directly from Microsoft.

For more information, see Starting VBS4 with Microsoft Bing Maps in the VBS4 Administrator Manual.

**Config Patch Builder**

Adds support for bulk modification of model asset parameters:

**Export:**

- **Export Filters** - select filter criteria to specify values to export as a config patch or `.csv` file.
- **Full Cache** - process the entire configuration as the source (for filtering values and export to `.csv`).
- **Export to CSV** - export all or filtered values to a `.csv` file.

**Batch Import** - process `.csv` files and update config cache values (new values and new classes).

## 10.2 VBS4 Portfolio

The following products are also available for use alongside VBS4 as separate installations.

> **FEATURE NOTICE**
> Use of these products requires additional licensing. For more information, contact sales@bisimulations.com.

**VBS Blue IG**

The VBS Blue Image Generator (VBS Blue IG) provides high-fidelity visualizations of data from VBS4 and Common Image Generator Interface (CIGI) simulations. VBS Blue IG is a whole-earth rendering solution, eliminating the need to limit simulations to the confines of terrain databases. With this software, highly detailed insets can be combined with procedurally generated terrain and vegetation to simulate scenarios anywhere on earth.

For more information, see VBS Blue IG (on page 153).

**VBS Simulation SDK and VBS IG SDK**

Enables developers to customize and extend VBS4 and VBS Blue IG by providing an API and suite of tools.

For more information, see VBS Simulation SDK (on page 155).

**VBS Developer Suite**

Enables you to create custom models and configure their simulation behavior using proprietary and industry-standard tools.

For more information, see VBS Developer Suite (on page 156) and the VBS Developer Reference documentation in the `/docs/` folder of your VBS Developer Suite installation.

> **FEATURE NOTICE**
>
> VBS Developer Suite is included with VBS4 and VBS Blue IG licenses but is a separate installation.

### VBS Radio Standalone

VBS Radio Standalone enables non-VBS4 users to communicate with VBS4 users participating in a VBS Radio scenario.

For more information, see VBS Radio Standalone (on page 147).

# 10.3 VBS Call for Fire Overview

VBS Call for Fire provides a simulated Fire Direction Center (FDC) for VBS4 to setup and enable rapid fire support for Trainees acting as Forward Observers (FO).

VBS Call for Fire enables Forward Observer (FO) units to practice the correct procedures and event sequences when requesting fire power. The main training goals are:

- Spotting targets and estimating their position, using standard VBS4 tools.
- Communication with the FDC Operator.
- Simple FDC operation to set up gunlines and enable the FDC Operator to provide the requested fire support.

**FEATURE NOTICE**

VBS Call for Fire is designed for specific doctrines, using specific units and equipment, and may not be suitable for all customer use cases.

To discuss potential new features or enhancements for VBS Call for Fire, please contact sales@bisimulations.com.

VBS Call for Fire is accessed through the VBS4 Editor, and provides the following functionality for Mission Designers and FDC Operators:

- Simulated artillery ballistics with real-time and AAR visual trajectory monitoring.
- Mortar and Howitzer gunlines, and vehicle / ship mounted guns with configurable timing events, caliber, loadout, layout, and dispersion / inaccuracy, including:
  - High Explosive, Smoke, and Illumination ammunition.
  - Ability to place and control up to ten gunlines simultaneously.
  - Minimal-effort with integration into VBS4 - Set up a gunline within 30 seconds of opening the VBS4 Editor.

**WARNING**

Placing vehicle and ship mounted weaponry when you Create Gunlines also adds the corresponding vehicle / ship model to the scenario. Therefore, it is not necessary to add vehicle and ship models separately.

- Target worksheet allows pre-planned target reference points and mission targets.

- Flexible mission creation:
  - Ability to see and create gunlines and fire missions specifically for BLUFOR or OPFOR sides.
  - Timed, proximity, impact, and delay fuses.
  - Targeting types: Polar, Grid, Shift, Recorded.
  - Common distribution patterns: Circle, Linear, Open, Range, Lateral, Range Lateral, Parallel, and Convergence.
  - Fine control over gun behavior:
    - Fire When Ready / At My Command
    - Fire With and Follow By
    - Check Fire
    - High / Low Trajectory
  - Adjust Fire behavior for mission adjustment.
  - Record Trainee reported information such as Target Description for review in After-Action Review (AAR).
- Detailed statistical info in both the real-time exercises and AAR.
  - Trajectory, Vertex, and Target symbology.
  - Mission Report with Time of Flight, Gun-Target Line, Angle T, Range, and other ballistic and mission information.
  - Automatically generated Message To Observer.
- The Fire Scheduling Plan makes it easy to pre-plan fire missions for automatic execution (see Fire Scheduling Plan in the VBS Call for Fire Manual).

There are three roles for successful CFF mission execution:

- **Scenario Designer**

  The Administrator / Instructor who creates a scenario, configures gunlines and their characteristics, and places them in the scenario.

- **Fire Direction Center (FDC) Operator**

  The Administrator or a Trainee who uses the FDC UI to configure gunlines / target coordinates, and instructs the guns to fire.

- **Forward Observer (FO)**

  The infantry Trainee on the ground, who communicates with the FDC Operator to request fire missions. The FO passes target coordinates to the FDC Operator using VBS Radio or other voice / text communication methods.

  > **NOTE**
  >
  > The FO can be any BLUFOR or OPFOR unit with a URN Marking (required) added to their Object Properties dialog. Specialized FO units are not required.

### 10.3.1 VBS Call for Fire Workflow

The VBS Call for Fire workflow primarily uses the Fire Direction Center (FDC) in the VBS4 Editor:

**Follow this process:**

1. Prepare a scenario in VBS4.

   For more information, see VBS Call for Fire Scenario Preparation (on page 111).
2. Start the Networked Mission and operate the FDC in the VBS4 Editor in Execute mode.

   For more information, see VBS Call for Fire Scenario Execution (on page 114).
3. Review Trainee performance.

   For more information, see VBS Call for Fire in AAR in the VBS Call for Fire Manual.

During VBS Call for Fire Scenario Preparation (on page 111) and VBS Call for Fire Scenario Execution (on page 114) use the Fire Direction Center to manage VBS Call for Fire operations:

**Follow this process:**

1. Access the FDC UI.

   For more information, see VBS Call for Fire - FDC UI in the VBS Call for Fire Manual.
2. Place gunlines on the map.

   For more information, see Gunline Management in the VBS Call for Fire Manual.
3. Place TRPs on the map.

   For more information, see Target Management in the VBS Call for Fire Manual.
4. Use the functions in the Fire Mission panel to create and manage fire missions.

   For more information, see VBS Call for Fire Mission Management in the VBS Call for Fire Manual.

A tutorial is available, explaining how to set up and use VBS Call for Fire at https://www.youtube.com/watch?v=UJ_ZpObl42A.

**NOTE**

The videos may not be up to date with the features they demonstrate, the latest state of which is described in this manual.

## 10.3.2 VBS Call for Fire Scenario Preparation

Use the Fire Direction Center to add gunlines and create targets and fire missions as an additional step in the typical process of creating scenarios for VBS4.

Use VBS Editor to create or edit a scenario, adding the personnel, vehicles, objectives, and hazards required for your training requirements.

**Follow these steps:**

1. Start VBS4 as an Administrator and access the main VBS4 UI in Battlespaces Mode.
2. Create a Battlespace in the Whole-Earth Terrain. See Battlespace Management in the Introduction to VBS4 Guide.
3. Select your Battlespace in the Battlespaces List, and use **Editor** in the Battlespace Functions panel. Highlight **Editor** and click **Create** to use VBS Editor to perform individual entity and detailed level modifications in your scenario.

   > **NOTE**
   >
   > For information about how to use the VBS Editor, see Mission Designer Interface in the VBS4 Editor Manual.

4. Use the VBS Editor to modify the terrain, set the scenario conditions, and populate the scenario with all the personnel, vehicles, equipment, and objects required for your scenario, with the specific exception of the gunlines required for the scenario. For more information, see Mission Designer Interface in the VBS4 Editor Manual.

   > **WARNING**
   >
   > If you intend to use vehicle / ship mounted weaponry, it is not necessary to add the corresponding vehicle / ship to the scenario, as this is done automatically when you Create Gunlines and select a Gun Type.

   > **NOTE**
   >
   > CFF does not support the Advanced Ballistics setting in VBS4.

5. Use the Gunlines Details panel to add gunlines and targets to the scenario, and configure scheduled fire missions:
   a. Configure gunlines, and place them on the map, see Gunline Management in the VBS Call for Fire Manual.
   b. Create targets, and place them on the map, see Target Management in the VBS Call for Fire Manual.
   c. Configure scheduled fire missions, see VBS Call for Fire Mission Management in the VBS Call for Fire Manual.
6. To preview your scenario press **Scenario Preview** (**H**) or click **Preview**.

   The scenario starts with you controlling the first playable character placed in the scenario.

   - Play the scenario as a Trainee to preview the scenario in action.

     For information about controlling your character, see Character Control in the VBS4 Trainee Manual.
   - Edit the scenario as an Administrator to play test different scenarios. Press **Map** (**M**), or press **Pause** (**Esc**) and select **Editor**, to open VBS Editor in Execute mode. For information about Execute mode in Call for Fire, see VBS Call for Fire Scenario Execution (on page 114).

     > **NOTE**
     > Any changes made to the scenario in VBS Editor only persist for the duration of the preview.

   - Return to Prepare mode to continue editing the scenario. Press **Pause** (**Esc**) and select **End Battlespace**.
7. To save your scenario click the **Main Menu** in the VBS4 Toolbar, and under **Battlespaces** select one of the following options:
   - **Save** - Saves changes into the currently open Battlespace.
   - **Save As** - Creates a new Battlespace, or overwrites the existing one, based on the name you enter in the dialog.

A saved scenario is available for use:

- Play the scenario as a single user from the Training Tab (must be saved as **Available as Singleplayer Training Mission**).

  For information about controlling your character, see Character Control in the VBS4 Trainee Manual.

- Host the scenario as the Administrator in **Execute Mode** from the **Battlespaces List**.

  For information about Execute Mode for VBS Call for Fire, see VBS Call for Fire Scenario Execution (on the next page).

- Use VBS Geo / VBS Plan / VBS Editor in **Prepare Mode** from the **Battlespaces List** to edit the scenario.

  For information about VBS Editor, see Mission Designer Interface in the VBS4 Editor Manual.

## 10.3.3 VBS Call for Fire Scenario Execution

The most important VBS Call for Fire (CFF) use case is the operation and administration of a multiplayer scenario during run-time.

As an Administrator / Instructor, start a Networked Multiplayer mission and then:

- Use VBS Editor in Execute mode to monitor the simulation Trainees, manage the scenario, and insert simulation objects, hazards, and events.
- Use VBS Call for Fire to create and manage gunlines, targets, and fire missions.

A typical Scenario Execution use case requires a Dedicated Server to host the mission with the Administrator operating an Admin Client on the same network. For more information, see Dedicated Server Scenario Execution (on page 89).

**Follow these steps:**

1. Start all VBS4 Dedicated Servers and Clients as required for your Scenario. For more information see Scenario Execution (on page 89).
2. In the Network Lobby, assign Trainees to characters, or allow them to select their own. When the playable characters you require for the session are assigned to Trainees, click **OK**.

   The Scenario Starts and displays the Mission Briefing view.

   > **NOTE**
   > Most use cases require a playable entity for the Administrator, typically an invisible spectator object. For more information, see Spectator Units in the VBS4 Editor Manual.

3. After allowing some time for Trainees to review the briefing, press **OK** to start the session.
4. Press **Map** (**M**), or press **Pause** (**Esc**) and select **Editor**, to open VBS Editor in Execute mode.
5. Use the VBS Editor to modify the scenario as it runs. For more information, see Instructor Interface in the VBS4 Instructor Manual.
6. During the scenario, use Fire Direction Center the to create and manage targets and fire missions based on communications with the Trainees (FOs), typically using VBS Radio.

> **NOTE**
> While multiple FDC Operators (enabled by starting VBS4 with the `-admin` parameter) can be used in VBS Call for Fire, it is recommended that FDC Operators are limited to a maximum of three, and that they are allocated control of separate gunlines, in order to prevent gunlines receiving conflicting instructions.

Administrators can record scenarios to enable later performance analysis, see VBS4 After Action Review in the VBS4 AAR Manual for details. VBS Call for Fire has a specific UI for use with AAR, which is discussed in VBS Call for Fire in AAR in the VBS Call for Fire Manual.

# 10.4 VBS Close Air Support

VBS Close Air Support provides simulated Close Air Support (CAS) using VBS Plan.

**FEATURE NOTICE**

VBS Close Air Support is a licensed product. For more information, contact sales@bisimulations.com.

**NOTE**

This use case is based on the VBS Close Air Support functionality. For legacy CAS functionality, see Close Air Support in the VBS4 Editor Manual.

The CAS simulation involves the following roles:

- **Instructor** - The Instructor prepares and executes the CAS scenario using VBS Editor and VBS Plan.
- **Joint Terminal Attack Controller (JTAC)** - The JTAC Trainee, also known as Forward Air Controller (FAC), directs the CAS aircraft against an enemy target by communicating the target position and clearance call (Cleared Hot or Abort) to the Instructor using VBS Radio.

For the general VBS Close Air Support simulation workflow, see VBS Close Air Support Workflow (on the next page).

For a walkthrough example of a VBS Close Air Support scenario, see VBS Close Air Support Example (on page 120).

## 10.4.1 VBS Close Air Support Workflow

The general VBS Close Air Support simulation workflow is divided into the following parts:

- VBS Close Air Support Preparation (below)
- VBS Close Air Support Execution (on page 118)
- VBS Close Air Support Assessment (on page 119)

### 10.4.1.1 VBS Close Air Support Preparation

As the Instructor, create a CAS scenario using VBS Editor.

**Follow these steps:**

1. If required, customize the CAS Unit aircraft and munitions functionality using JSON configuration in:

   `\VBS_Installation\Components\VBSChalkboard\config\cas_parameters.json`

   See CAS Unit Parameters in the VBS Plan Manual.

   **WARNING**

   The following considerations apply:

   - When modifying `cas_parameters.json`, make sure VBS4 is not running.
   - Use the same `cas_parameters.json` on all computers in your VBS4 network (see VBS4 Deployment Options in the VBS4 Deployment Guide). Having different versions of `cas_parameters.json` on the computers in your VBS4 network may lead to unexpected results.

2. Use VBS Editor to create a new Scenario, or edit an existing one.
3. Add BLUFOR JTAC units and enemy OPFOR personnel:

| Entity | Description |
|---|---|
| JTAC Unit | Any FAC / JTAC unit. For example:<br>• **US USMC Desert > FAC/JTAC - M16A3 ACOG**<br>• **US USMC Woodland > FAC/JTAC - M16A3 ACOG** |
| Enemy Personnel | Any land / sea enemy personnel used as a CAS target. |

   Add personnel to the scenario.

   For more information on placing units, see Adding Units in the VBS4 Editor Manual.

4. Add OPFOR vehicles:

| Entity | Description |
|---|---|
| Enemy Vehicle | Any land / sea enemy vehicle used as a CAS target. |

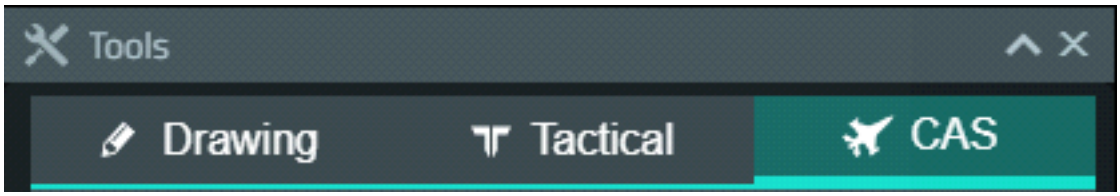
   Add vehicles to the scenario.

   For more information on placing vehicles, see Adding Vehicles in the VBS4 Editor Manual.

5. Add OPFOR structures as CAS targets.

   For more information, see Placing and Editing Models in the VBS Geo Manual.

6. In the VBS4 Toolbar, select **Plan** to switch to VBS Plan.
7. In the Tools Panel, open the **CAS** tab, where the CAS tools are located.




8. Add a CAS Unit aircraft, using the instructions in CAS Units Tool in the VBS Plan Manual.
9. Add a No Fly Zone (NFZ), using the instructions in CAS No Fly Zone (NFZ) Tool in the VBS Plan Manual.
10. Add a No Fire Area (NFA), using the instructions in CAS No Fire Area (NFA) Tool in the VBS Plan Manual.
11. Depending on the aircraft type (fixed-wing or rotary-wing), do any of the following:
    - For fixed-wing CAS aircraft, add Control Points (CPs) and Initial Points (IPs), using the instructions in CAS Control Point (CP) Tool and in CAS Initial Point (IP) Tool in the VBS Plan Manual.
    - For rotary-wing CAS aircraft, add Holding Areas (HAs) and Battle Positions (BPs), using the instructions in CAS Holding Area (HA) Tool and in CAS Battle Position (BP) Tool in the VBS Plan Manual.
12. Build the mission to convert the CAS Plan symbols (CAS aircraft, CPs / IPs / HAs / BPs) to mission entities. See Build Missions in the VBS Plan Manual.
13. To use realistic dispersion for CAS munitions, enable the **CAS Dispersion** simulation option.

> **NOTE**
>
> **CAS Dispersion** is enabled by default.

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

The CAS scenario is prepared. As Instructor, create the CAS Mission Order that uses CAS Unit aircraft, CPs / IPs / HAs / BPs, during scenario execution.

### 10.4.1.2 VBS Close Air Support Execution

Once the CAS scenario is prepared by the Instructor, it can be executed by the JTAC player and Instructor.

**Follow these steps:**

1. As the Instructor, run the CAS scenario in Execute Mode.

   Start the Scenario and open VBS Editor.

   For more information, see Scenario Execution (on page 89).

2. As a JTAC player, use a Laser Designator to mark the targets and get their Pulse Repetition Frequency (PRF) codes used in the CAS attack.

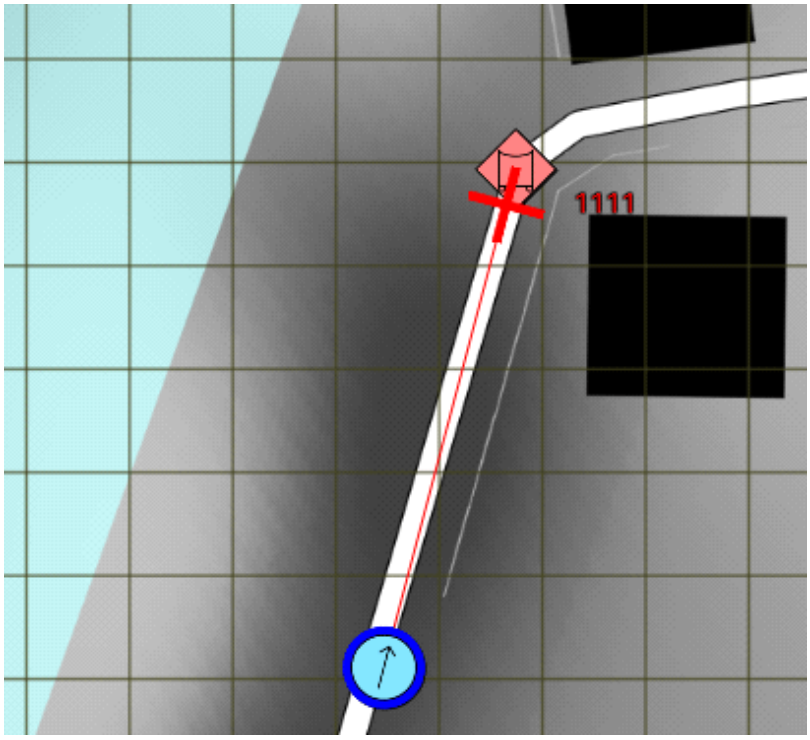
   For more information, see Laser Designator in the VBS4 Trainee Manual.

3. As the Instructor, use the VBS Editor to observe the laser lines in the 2D View (not available in the 3D View) and laser target markers in 2D and 3D Views.

   **TIP**

   You can toggle the visualization of laser lines in the VBS Editor. For more information, see Show / Hide Laser Target Lines in the VBS4 Instructor Manual.

   **Image-8: Laser line, cross target marker, and PRF code in the 2D View**



4. As a JTAC player, you have the option to:
   - Communicate the CAS target position and clearance call to the Instructor over VBS Radio.

     For more information, see Using VBS Radio in the VBS Radio Manual.
   - Communicate the CAS target position to the Instructor using a CAS 5-Line or 9-Line Form.

     For more information, see Forms in the VBS4 Trainee Manual.
5. As the Instructor, add a CAS Mission Order for the specified CAS target, using the instructions in CAS Mission Order Tool in the VBS Plan Manual, with the CAS Unit aircraft and CPs / IPs / HAs / BPs created in VBS Close Air Support Preparation (on page 116).
6. As the Instructor, set the clearance call type (Cleared Hot or Abort) in the Available Aircraft Panel, based on the information received from the JTAC, using the instructions in CAS Available Aircraft Tool in the VBS Plan Manual.

The CAS Mission Order executes on the specified target.

#### 10.4.1.3 VBS Close Air Support Assessment

As an Instructor, if you select **Record AAR** in VBS Close Air Support Execution (on the previous page), after the CAS mission finishes executing, you can assess it in the After Action Review (AAR).

**Follow these steps:**

1. Open the AAR recording of your CAS mission:
   a. Select the CAS Battlespace in the Battlespaces List.
   b. Under **Assess**, highlight the AAR recording and click **Open**.

   The AAR recording of the CAS mission loads and the AAR UI opens.
2. Click the **CAS** tab in the AAR.

   The CAS AAR UI opens, containing the following elements:
   - CAS Event List Panel
   - CAS Mission List Panel

   For more information, see the topics in the VBS Plan Manual.
3. In **Player Controls**, click **Play** to start the CAS mission playback for assessment.

For more information on the CAS AAR UI, see VBS Close Air Support (CAS) in AAR in the VBS4 AAR Manual.

## 10.4.2 VBS Close Air Support Example

The purpose of this example is to create a CAS scenario using VBS Plan and VBS Editor.

The scenario location should consist of a hill overlooking a valley or a plain.

The scenario is divided into Preparation and Execution phases:

- VBS Close Air Support Example Preparation (below)
- VBS Close Air Support Example Execution (on page 128)

### 10.4.2.1 VBS Close Air Support Example Preparation

The Preparation phase consists of placing all the VBS Plan and VBS Editor Objects to run the CAS mission.

**Follow these steps:**

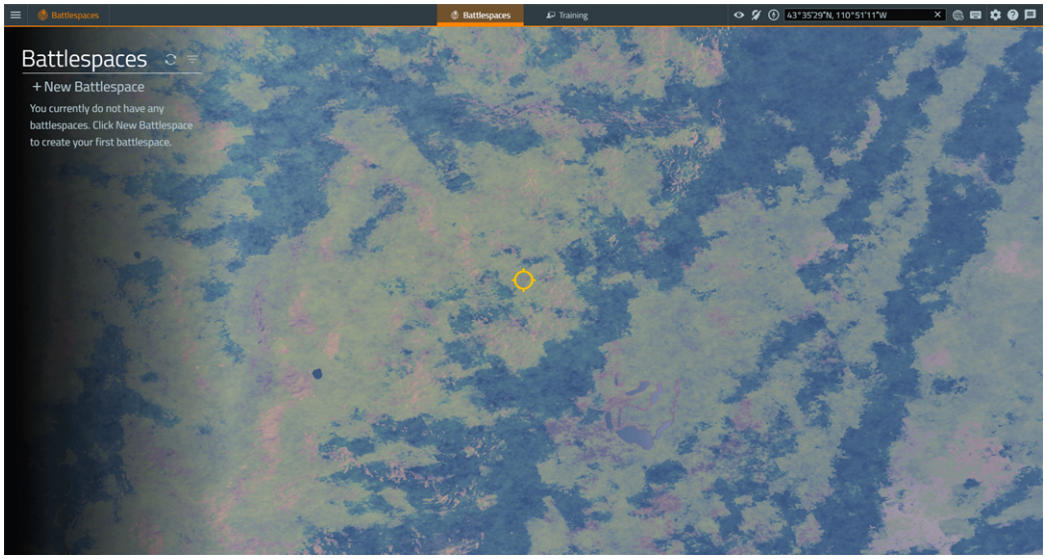
1. Start VBS4 with VBS Radio. For more information, see Step 2 of VBS Close Air Support Preparation (on page 116).
2. In the VBS4 Toolbar of the Battlespaces Mode, select the **Battlespaces** tab.

   > **NOTE**
   > When starting the VBS4 Admin Client, the Battlespaces tab is selected by default.

3. In the Search Bar of the VBS4 Toolbar, input the coordinates **43°35'29"N, 110°51'11"W**, and then press **Enter**.

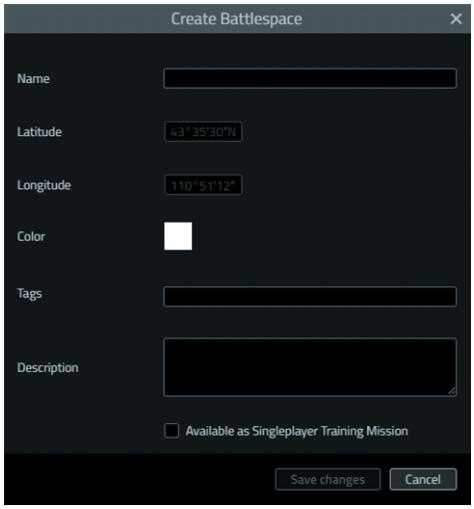
   The Whole-Earth Terrain rotates directly above the specified location in the United States.

   Use the **Mouse Scroll Wheel** to zoom in to view the area displayed.



4. Click **+ New Battlespace** and click the location of the **yellow** circle.

   The Create Battlespace dialog opens, displaying the selected coordinates.

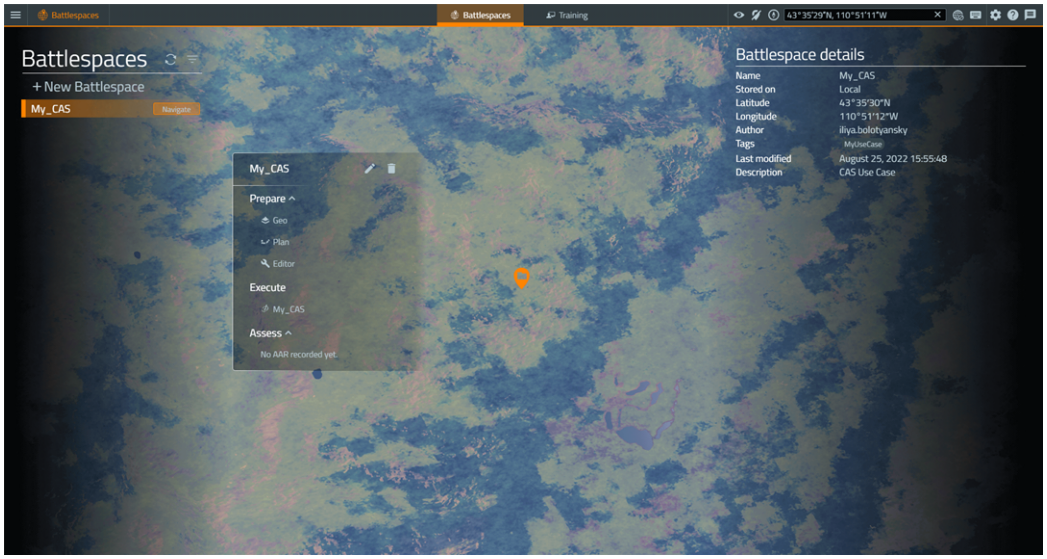



5. Input the following details in the Create Battlespace dialog:

| Parameter | Value |
|---|---|
| **Name** | My_CAS |
| **Color** | **Green** #36b82c |
| **Tags** | MyUseCase |
| **Description** | CAS Use Case |

6. Click **Save Changes**.

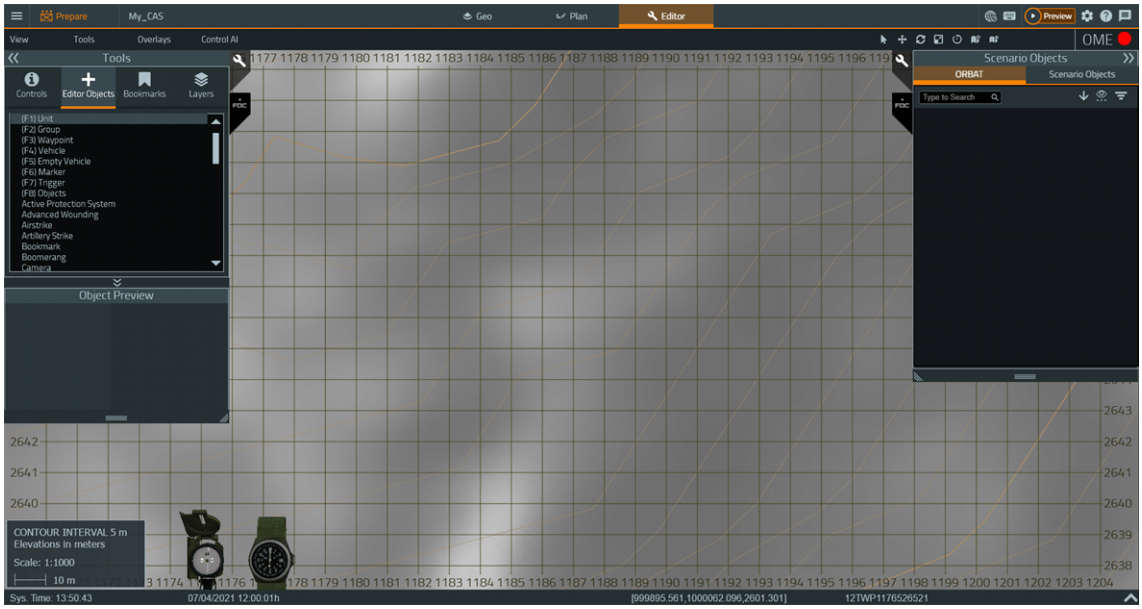
   VBS4 adds the Battlespace to the Battlespaces List.



7. Select the newly created **My_CAS** Battlespace to show a **green** icon added to the Whole-Earth Terrain in the designated location.
8. Under **Prepare > Editor**, click **Create**.

   The Battlespace opens in the VBS Editor (Prepare Mode) in the 2D View.




Use the Classic Camera Controls to move the camera:

9. Place a JTAC unit:
   a. In the Editor Objects List, select **(F1) Unit**.
   b. Click a location on the map that is on a hill with a large field of view.

      The Objects Properties dialog opens.
   c. Place a player JTAC unit of the following type: **US USMC Woodland > FAC/JTAC - M16A3 ACOG**


> **NOTE**
>
> Set the JTAC unit to **Player**, so that it can be selected in the Network Lobby (see Network Lobby in the VBS4 Instructor Manual).

   d. In **URN Marking**, enter: **JTAC**
   e. Click **OK**.

   The JTAC unit is placed on the map.

10. Repeat step 9 to place an Instructor unit, with type **VBS Objects > Invisible Spectator (RTE)** and **URN Marking** set to **Admin**, anywhere in the vicinity of the JTAC.

> **NOTE**
>
> Set the Instructor unit to **Playable**, so that it can be selected in the Network Lobby.

11. Place an OPFOR target:
    a. In the Editor Objects List, select **(F4) Vehicle**.
    b. Click a location on the map that is about 2 km south-east of the JTAC.

       The Objects Properties dialog opens.

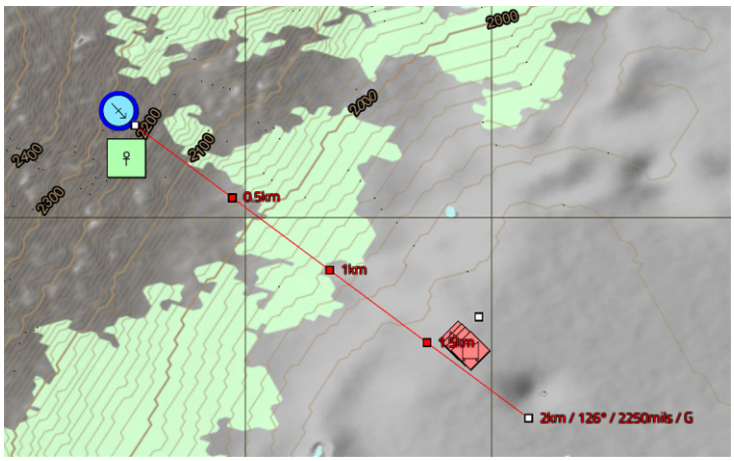
       > **TIP**
       > To measure the distance from the target, in the VBS4 Toolbar, select **Editor** and use the Measure Distance Tool in the VBS4 Editor Manual. After measuring the distance, you can delete the distance line, to avoid object cluttering.

    c. Place an OPFOR vehicle of the following type: **Generic OPFOR Wheeled - Woodland > Ural 4320 - Ammo**


    d. In **URN Marking**, enter: **OPFOR_Convoy**
    e. Click **OK**.

    The OPFOR vehicle is placed on the map.

12. Repeat step 11 to place three more OPFOR vehicles of the same type.



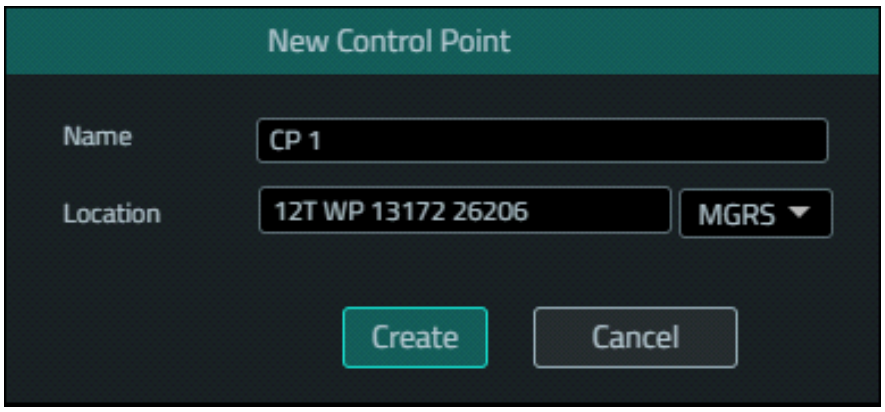
13. In the VBS4 Toolbar, select **Plan**.

    The Battlespace opens in VBS Plan (Prepare Mode) in the 2D View.

14. In the Tools Panel, select the **CAS** tab and select the **CAS Control Point (CP) Tool**.


15. Click any location on the map to place a CP.

    The New Control Point dialog opens.




16. In **Name**, enter **CP Alpha**.
17. Click **Create**.

    The CP is placed on the map.

18. Repeat steps 14 - 17 to place another CP with **Name** set to **CP Bravo**.

19. Select the **CAS Initial Point (IP) Tool**.


20. Click any location on the map to place an IP.

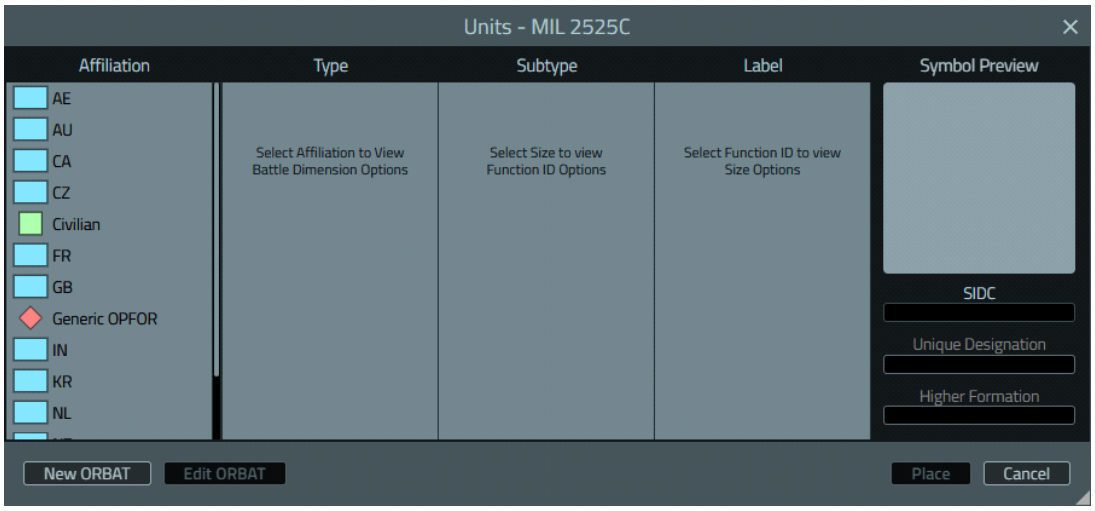
    The New Initial Point dialog opens.


21. In **Name**, enter **IP Alpha**.
22. Click **Create**.

    The IP is placed on the map.

23. Select the **CAS Units Tool**.

    The CAS Units table appears (you can drag the bottom-right corner to resize the table).



24. Set the following:

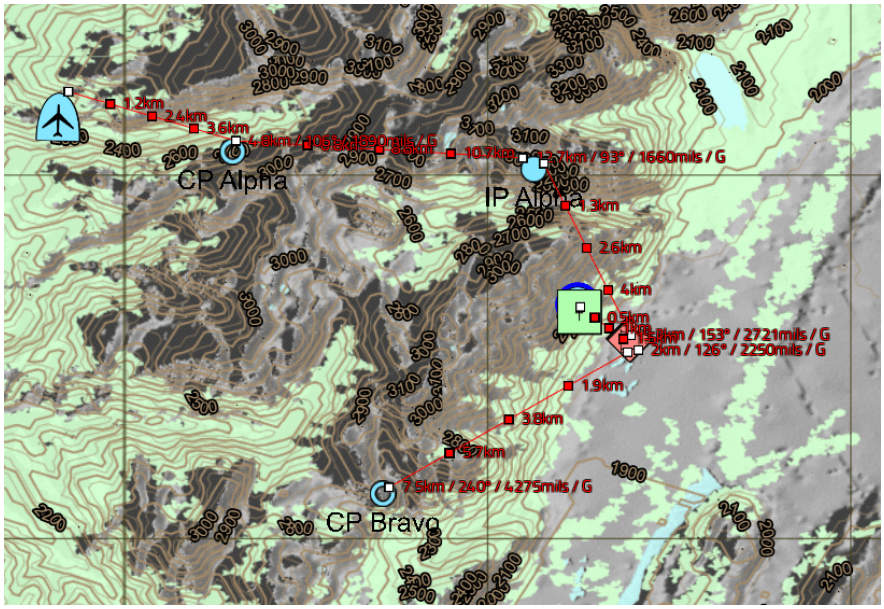
| Column | Value |
|---|---|
| **Affiliation** | US |
| **Type** | Air Unit |
| **Subtype** | A-10A |
| **Label** | 1 Aircraft |
| **Unique Designation** | Alpha |

25. Click **Place**.

    The CAS Units table disappears.

26. Click any location on the map to place the CAS Unit.

27. Drag the CAS Unit, CPs, and IP so that they are positioned and distanced from each other in the following way:




28. Click **Build Mission**.

    The CAS Unit symbol is converted into CAS aircraft mission entities.

The CAS scenario is prepared for execution.

To run the scenario in Preview Mode, press **Scenario Preview** (**H**).

**TIP**

It is recommended to test the scenario first in Preview Mode, acting both as the Instructor and JTAC Trainee.

**NOTE**

The CAS Scenario is also available as a sample Battlespace in:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

Compare your version of the scenario to the sample by deploying the sample Battlespace to VBS4.

**Follow these steps:**

- For Online use cases, do the steps in Copy Battlespace (below) on the VBS World Server computer, and then synchronize the Battlespace on the VBS4 Client connected to VBS World Server.
- For Offline use cases, copy the Battlespace from the `\optional\` folder.

  **Copy Battlespace**

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (on page 83) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (on page 80) using **UseCase** as the filter.

Select the sample Battlespace and select **Prepare > Editor > Open** to review the Scenario using VBS Editor.

### 10.4.2.2 VBS Close Air Support Example Execution

You can now execute the CAS scenario with two player participants: the Instructor and JTAC Trainee.

**Follow these steps:**

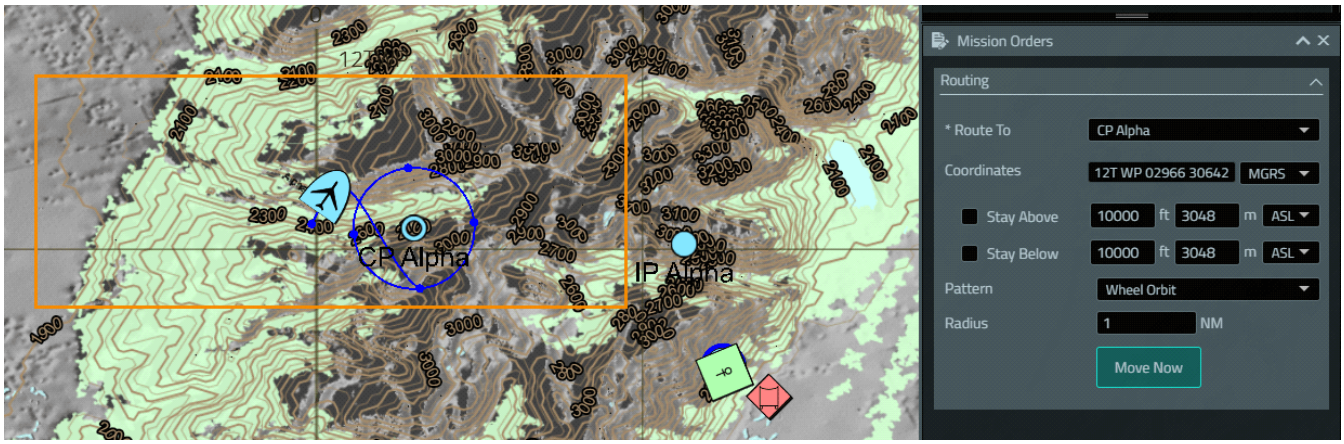
1. As the Instructor, execute the CAS scenario according to Step 1 of VBS Close Air Support Execution (on page 118).
2. In VBS4 Toolbar, select **Plan** to switch to VBS Plan.
3. Select the CAS Unit created in Step 26 of VBS Close Air Support Example Preparation (on page 120).

4. In the **CAS** tab, select the **CAS Mission Order Tool**.

The Mission Orders panel is enabled (prior to the CAS Mission Order Tool selection, it is grayed out).

5. In **Mission Orders > Routing**, route the CAS Unit to CP Alpha:
   a. In the **Route To** drop-down, select **CP Alpha**.
   b. Click **Move Now**.

The CAS Unit spline (flight trajectory) appears.



6. As the JTAC Trainee, designate the OPFOR targets for the Instructor:
   a. Press **Binoculars** (**B**) and observe the OPFOR vehicles.


   b. As the JTAC Trainee, you have the option to:
      - Communicate the CAS target position to the Instructor over VBS Radio.

        For more information, see Using VBS Radio in the VBS Radio Manual.
      - Communicate the CAS target position to the Instructor using a CAS 5-Line or 9-Line Form.

        For more information, see Forms in the VBS4 Trainee Manual.
7. As the Instructor, receive the target information from the JTAC Trainee over VBS Radio.

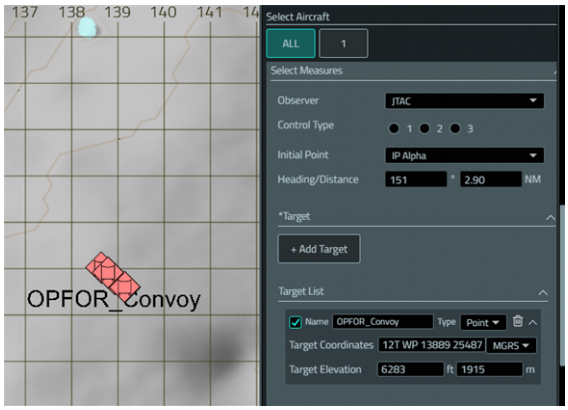
> **NOTE**
>
> JTAC Trainees can make mistakes. The purpose of this CAS example scenario is to allow Instructors to incorporate incorrect information provided by the JTAC Trainee. This allows the JTAC Trainee to see the risks and negative consequences.
>
> Specific military doctrine affects how JTAC Trainees call for CAS. The focus of this example is to use the VBS Close Air Support UI, to execute a CAS Mission Order.

8. In **Select Aircraft**, set the following Measures:
   - In the **Observer** drop-down, select **JTAC**.
   - In the **Initial Point** drop-down, select **IP Alpha**.

9. In **Select Aircraft**, create a Target:
   a. Click **Add Target** to add a CAS target, based on the target information received from the JTAC Trainee.
   b. Click anywhere close to the OPFOR vehicle symbols on the map.

      The New Point Target dialog opens.
   c. Set **Name** to **OPFOR_Convoy** and click **Create**.

      The CAS target is created under **Target List**.




You can edit existing CAS targets under **Target List**:

- Change the target properties in the relevant entries.
- Drag the target marker on the map to relocate the target.
- Click the **Trash** icon to delete the target.

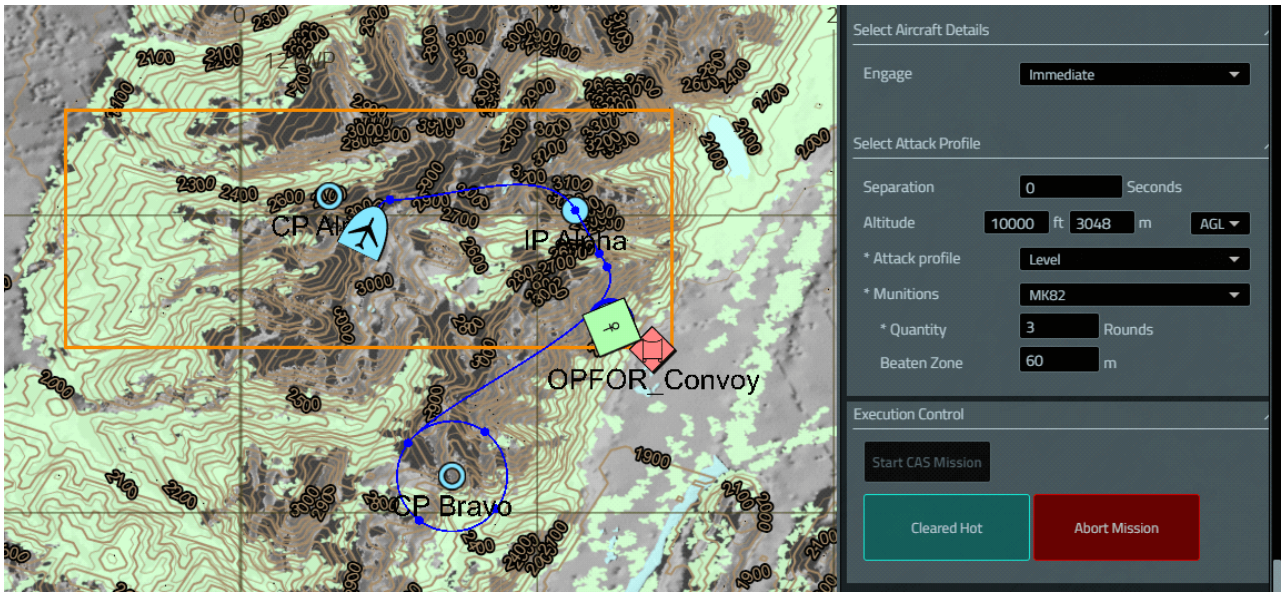
10. In **Select Aircraft**, specify the mission detail:
    a. In the **Engage** drop-down, select one of the following settings:
        - **Immediate**
        - **Time On Target**
        - **Time To Target**

        For more information, see Select Aircraft Details Properties in the VBS Close Air Support Manual.
    b. Fill in the other properties based on the JTAC communication:

| Property | Value |
|---|---|
| **Mark Type** | None |
| **Friendly Location** | NW |
| **Egress Location** | CP Bravo |
| **Altitude** | 10000 ft AGL |
| **Attack Profile** | Level |
| **Munitions** | MK82 |
| **Quantity** | Any value between 1 - 4 |
| **Beaten Zone** | 60 m |

c. Click **Start CAS Mission**.

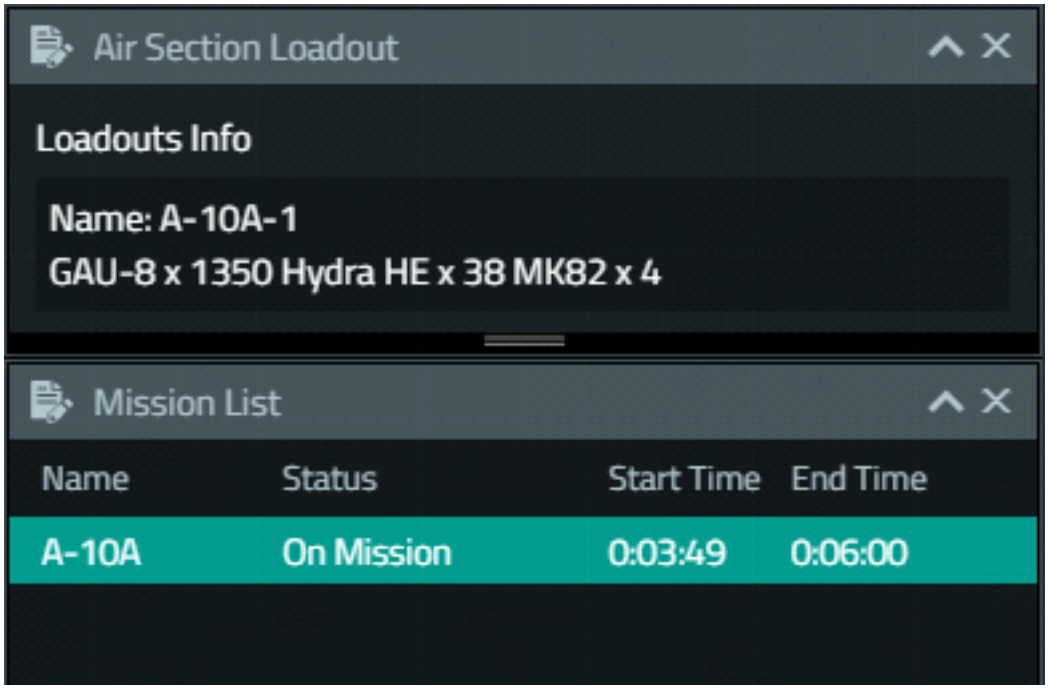
The CAS Mission Order is created and started, with the **Cleared Hot** and **Abort Mission** buttons becoming enabled.



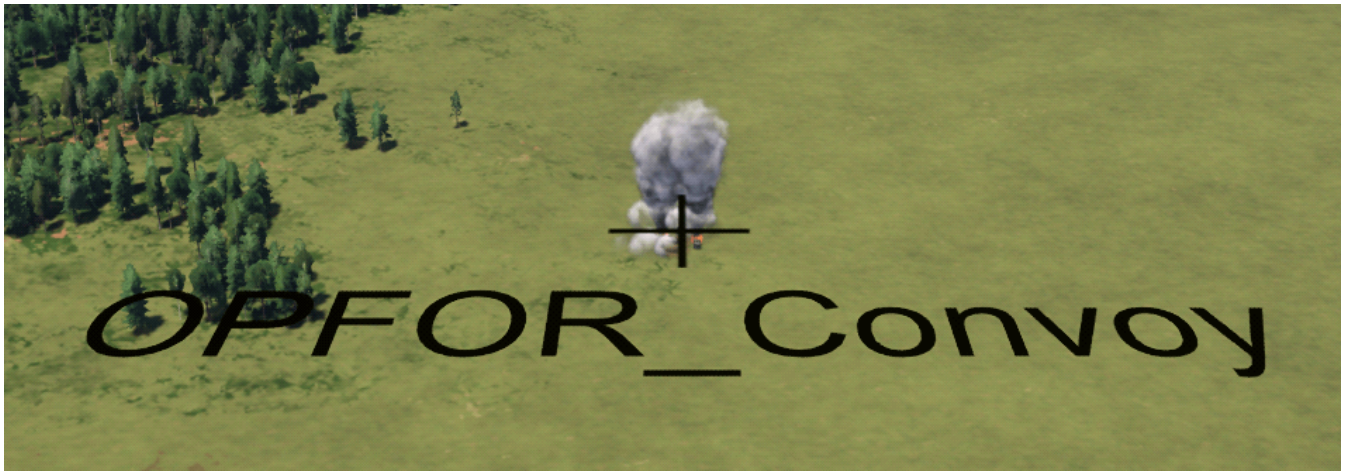

11. As the JTAC Trainee, when ready, communicate the Cleared Hot to the Instructor over VBS Radio.

12. As the Instructor, click **Cleared Hot**.

    The Mission List shows the **On Mission** status.




    The Instructor and JTAC Trainee can observe the result of the munitions hitting the target.




The CAS scenario is executed.

# 10.5 VBS Control AI Overview

VBS Control AI provides a set of AI behaviors with Computer Generated Forces (CGF)-like capabilities. It supplements the regular VBS4 AI and offers a familiar VBS Editor based user interface.

In VBS4 both Game AI and Control AI are available by default, while Control AI is the AI type used by VBS Plan.

Control AI uses Control AI Waypoints (see the VBS4 Editor Manual), and has advantages over Game AI in the following capabilities:

| Capabilities | AI Sub-Type | Additional Aspects |
|---|---|---|
| Convoy Training, Driver Training, Enemy Ambush, OPFOR Tactics, or any vehicle focused capabilities.<br>For more information on convoy capabilities, see Convoys (on page 161). | Convoy AI (see the VBS4 Editor Manual) | The Control AI convoy has the following additional aspects:<br>• The convoy has behavior that can be paused / continued.<br>• The convoy has a leader, which is dynamically selectable and can be replaced.<br>• The convoy dynamically determines the order of convoy succession, based on the convoy vehicle placement.<br>• The convoy can drive both on and off the road.<br>• The convoy reactions to enemy contact or fire can be set. |
| Enemy Ambush, OPFOR Tactics.<br>For more information on these capabilities, see Enemy Ambush (on page 173). | AI on Rails (see the VBS4 Editor Manual) | • Fine-tune enemy placement to prepare an ambush.<br>• Use Triggers to create dynamic situations.<br>• Branch Control AI Waypoints to achieve different outcomes on each Scenario run. |
| Dry Support Bridge (DSB) Training.<br>For more information about DSB laying capabilities, see HX45M Bridge Laying (Land 155) (on page 257). | Bridge Laying Convoy AI (see the VBS4 Editor Manual) | • Place DSBs of varying lengths at the required places on the terrain. |

| Capabilities | AI Sub-Type | Additional Aspects |
|---|---|---|
| Large-scale battles with a primary focus on fighting and maneuvers. | VBS Plan (see VBS Plan Overview in the VBS Plan Manual) | • Place large amounts of military entities easily, using VBS Plan.<br>• Have the entities maneuver and attack the enemy on their way.<br>• Place tanks or mechanized platoons. |
| Military infantry and vehicle fighting and maneuvers. | Military AI (see the VBS4 Editor Manual) | • Have infantry and vehicle AI perform general-purpose military orders. |
| Civilian pattern of life. | Civilian AI(see the VBS4 Editor Manual) | • Create a civilian pattern of life that consists of pedestrians and vehicles.<br>• Create various activities for pedestrians. |
| Animal-herd behaviors. | Animal AI(see the VBS4 Editor Manual) | • Add animal-herd movement. |

For an overview of the Control AI UI and its Editor Objects, see Control AI UI Overview in the VBS Control AI Manual.

**How-tos:**

- Control AI Waypoints - Describes how waypoints can be created by linking Control AI Editor Objects.
- AI on Rails - Describes waypoint-based movement and movement visualization for individual entities.
- Military AI - Describes the general-purpose military infantry and vehicle Control AI and its use cases.
- Convoy AI - Describes the convoy Control AI and its use cases.
- Civilian AI - Describes the civilian Control AI and its use cases.
- Animal AI - Describes the animal-herd Control AI and its use cases.
- Navigation Meshes - Describes how to create and update a map navigation mesh.
- Control AI Visualization - Describes how to use debug visualization for Control AI entities.

For details, see the topics in the VBS Control AI Manual.

**Reference:**

- Example Content - Lists the Control AI example missions, available with VBS Control AI.
- Known Issues - Lists the current VBS Control AI issues / limitations.

For details, see the topics in the VBS Control AI Manual.

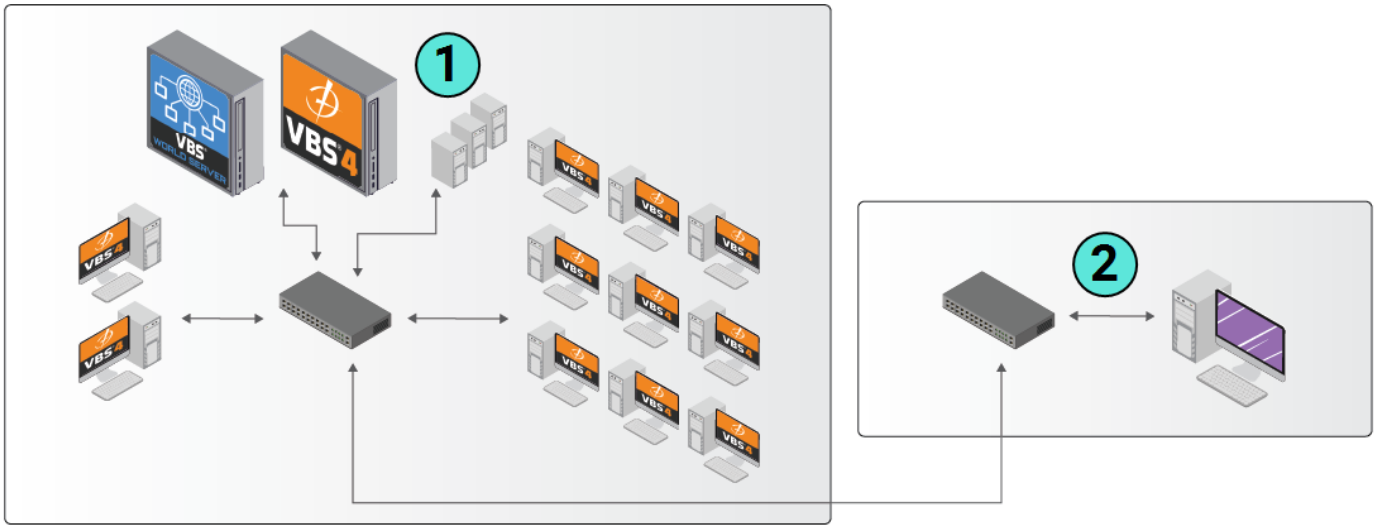
# 10.6 VBS Gateway Overview

VBS Gateway is the premier gateway for VBS4. VBS Gateway provides a DIS / HLA link between VBS4 and other simulations for distributed training exercises. VBS Gateway comes as standard with VBS4 and automatically connects to other VBS Gateway clients out of the box with no configuration changes.

VBS Gateway brings live loading, user-friendly configuration capabilities, a real-time user interface, and significant performance enhancements as the new VBS4 gateway system.

- Live entity editing.
- Higher frame rates for better visualization.
- User-friendly mapping of shared entities.
- Smoother transitions with dead reckoning.
- Filter and search functions with descriptive model names.
- Access to the UI through VBS4 or directly in a web browser.
- Actionable feedback for determining mapping errors.

**Image-9: Simplified Gateway Network Diagrams for DIS and HLA Communications**




| | |
|---|---|
| 1 | Dedicated Server running VBS4 with VBS Gateway. |
| 2 | DIS / HLA-compliant simulation product. |

These topics in the VBS Gateway Manual provide the information required for the following roles:

### Communications Administrator

The Communications Administrator is responsible for the setup, configuration, and monitoring of the communication between the linked simulation products and VBS4:

- Configure VBS Gateway
- Communications Monitoring

### Simulation Administrator

The Simulation Administrator is responsible for the configuration, monitoring, and modification of the simulation object protocol models, ensuring that remote entities are represented appropriately in VBS4, and that VBS4 entities are communicated correctly to the other simulators:

- Configure Simulation Modeling
- Simulation Monitoring

The Simulation Administrator should review the Mapping Tables to understand how VBS Gateway maps local and remote entities.

All roles should refer to Launching VBS Gateway and VBS Gateway UI to perform their functions and may need to refer to VBS Gateway Advanced Configuration to configure advanced settings and to troubleshoot VBS Gateway.

VBS Gateway supports the following protocols:

- DIS v4-v7
- HLA FOMs including RPR1 and RPR2

> **NOTE**
>
> RTIs supports multiple HLA API versions (1.3, 1516, 1516e, and 1516-dlc), Java and C++, and several C++ compiler versions. Simulators can pick any combination while still being able to connect to each other.
>
> VBS Gateway uses 1516e (HLA Evolved API).

VBS Gateway supports the following HLA Run Time Infrastructures (RTIs):

- MÄK RTI version 4.5

  Compatible with MSVC 14.0 or 15.0

  For more information, see https://www.mak.com/mak-one/tools/mak-rti.
- Pitch pRTI Free version 5.3.2.1

  Compatible with MSVC 14.0 or 15.0

  For more information, see http://www.pitchtechnologies.com/products/prti/.

## 10.6.1 Appendix: Supported DIS PDUs

VBS Gateway supports the following DIS PDUs. See the link below each description for detailed information about that packet type.

- **EntityState** - This packet contains entity information, such as spatial / orientation data and any articulated parts:

  http://faculty.nps.edu/brutzman/vrtp/mil/navy/nps/disEnumerations/JdbeHtmlFiles/pdu/29.htm

- **Designator** - This packet contains designator information, such as power and wavelength:

  http://faculty.nps.edu/brutzman/vrtp/mil/navy/nps/disEnumerations/JdbeHtmlFiles/pdu/d3.htm

- **Fire** - This packet contains the details of a weapon fire event:

  http://faculty.nps.edu/brutzman/vrtp/mil/navy/nps/disEnumerations/JdbeHtmlFiles/pdu/7c.htm

- **Detonation** - This packet contains the details of a detonation event:

  http://faculty.nps.edu/brutzman/vrtp/mil/navy/nps/disEnumerations/JdbeHtmlFiles/pdu/84.htm

- **Acknowledge** - This packet is used to acknowledge receipt of certain PDUs:

  http://faculty.nps.edu/brutzman/vrtp/mil/navy/nps/disEnumerations/JdbeHtmlFiles/pdu/a3.htm

- **Data** - This packet contains data used by Gateway to print out information in string format. If logging is turned on, this data appears in the log:

  http://faculty.nps.edu/brutzman/vrtp/mil/navy/nps/disEnumerations/JdbeHtmlFiles/pdu/b2.htm

- **SetData** - This packet contains data, which VBS Gateway reads as a string and runs as a script command if the datum ID is the same as the datum ID set in the Gateway settings. If logging is turned on, this command is recorded in the log:

  http://faculty.nps.edu/brutzman/v
  rtp/mil/navy/nps/disEnumerations/JdbeHtmlFiles/pdu/b0.htm

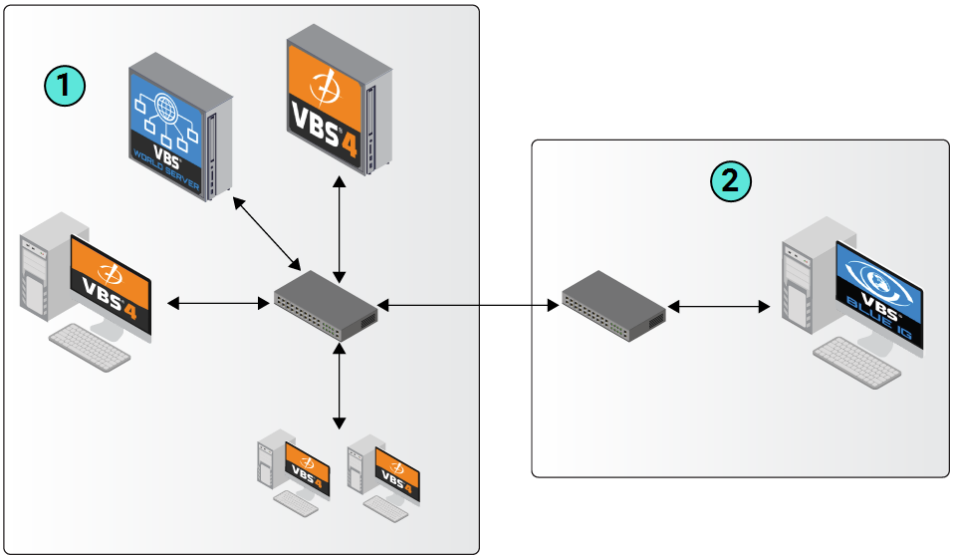
- **IFF** - This packet contains data representing a transponder that produces Identification Friend of Foe (IFF) responses when it receives an appropriate signal.

# 10.7 VBS Host Overview

VBS includes a set of capabilities to broadcast specified viewpoints to VBS Blue IG.

- VBS includes a dedicated host component to broadcast directly to VBS Blue IG.
- VBS uses IG View Objects to place viewpoints into scenarios which can then be linked to a vehicle or unit.
- Each IG View Object specifies a configuration that determines the perspectives for that viewpoint and the IG clients to broadcast them to.

**Image-10: Simplified Network Diagram for Broadcast to VBS Blue IG**




| | |
|---|---|
| 1 | Dedicated Server running VBS |
| 2 | VBS Blue IG |

These topics in the VBS Host Manual explain how to use VBS to broadcast to VBS Blue IG:

1. Create IG View Configuration Files
2. Add IG Viewpoints to Scenarios
3. If VBS is hosting an interoperable simulation with other DIS compliant products, enable VBS to broadcast the external entities to the IG product by Enabling DIS Entities.
4. To run VBS in broadcast mode, start VBS with the appropriate startup parameter, according to the following installed application:
   - **VBS Blue IG** - Use the `-vbsHostNet` parameter.
   - **Other CIGI-compliant IG products** - Use the `-gateway` parameter.

For more information about using VBS as a host for VBS Blue IG, see Quick Start: VBS Blue IG with VBS4 Host in the VBS4 Administrator Manual.

# 10.8 VBS Radio Overview

VBS Radio simulates radio and other communication within VBS4 and as part of larger cross-product integrations.

**FEATURE NOTICE**

VBS Radio supercedes the legacy Radio 18.2 product, resulting in significant changes to the previous radio workflow. For more information, see VBS Radio Workflow Changes.

VBS Radio is enabled by default.

Use the `-disableVBSRadio` option in VBS Launcher to disable VBS Radio.

Before using VBS Radio, review VBS Radio Concepts and to understand the terminology and infrastructure of VBS Radio.

VBS4 includes a free version of VBS Radio, with certain limitations. VBS Radio Pro is available with separate licenses and provides more features and functionality. For more information, see VBS Radio Licensing.

To see how VBS Radio Pro works, watch the video at https://www.youtube.com/watch?v=tPj-oqwo3mY.

**NOTE**

The videos may not be up to date with the features they demonstrate, the latest state of which is described in this manual.

**To setup and use VBS Radio, use the following process:**

1. Start VBS4 as an Administrator with VBS Radio enabled, and use VBS Editor to setup the Communication Channels and Radio Types for your mission.

   See Setting Up VBS Radio in the VBS Radio Manual.

2. If necessary, make adjustments to Direct Talk, volume, and other settings in the configuration `.xml` file.

   See VBSRadioSettings Configuration File in the VBS Radio Manual.

3. Setup any radio jamming required for the scenario.

   See VBS Radio Jamming Device in the VBS Radio Manual.

4. The Administrator and Trainees use VBS4 to start and join a networked mission with VBS Radio enabled by default. Optionally, use the **Advanced > Radio** tab in VBS Launcher to specify standalone Pitch Servers or Multicast.

   See Starting VBS Radio in the VBS Radio Manual.

5. Units in the mission communicate using the assigned Radio Types and Communication Channels.

   See Using VBS Radio in the VBS Radio Manual.

6. Instructors running the mission can monitor and communicate on all channels using the VBS Radio Control panel.

   See Monitoring VBS Radio in the VBS Radio Manual.

7. Non-VBS users can communicate with users in a VBS Radio scenario using a separate client application.

   For more information, see VBS Radio Standalone (on page 147).

8. After a mission ends, radio usage is available for review as part of an After Action Review (AAR) recording.

   See VBS Radio Playback in AAR in the VBS Radio Manual.

Review VBS Radio Troubleshooting in the VBS Radio Manual if you encounter issues while using VBS Radio.

**FEATURE NOTICE**

VBS Radio uses Pitch Talk, created by Pitch Technologies, as its communication and networking layer. Pitch Talk uses Pitch pRTI as its infrastructure for the networking layer which is an implementation of the HLA 1516-2010 communication standard. VBS Radio also includes the Pitch DIS Gateway implementation to enable integrated communication with products that use the DIS communication standard.

For more information about Pitch Talk, see http://pitchtechnologies.com/products/talk/.

## 10.8.1 VBS Radio Concepts

VBS Radio enables communication using the following concepts:

- **Radio Types**

  Radio Types represent the capabilities of physical communication devices, defining the parameters of a radio system, such as the number of channels, range, and bandwidth.

- **Communication Channels**

  VBS Radio uses Communication Channels to provide the following types of communication:

  - **VoIP Networks**

    Voice over IP (VoIP) networks can be used for exercise control communication.

    > **NOTE**
    > Distance degradation and Jammer effects are not available for VoIP Networks.

  - **Radio Channels**

    Radio Channels have frequency assignments and are used to simulate radio communication, including distance-based degradation and Jammer effects.

  - **Vehicle Intercom Mode**

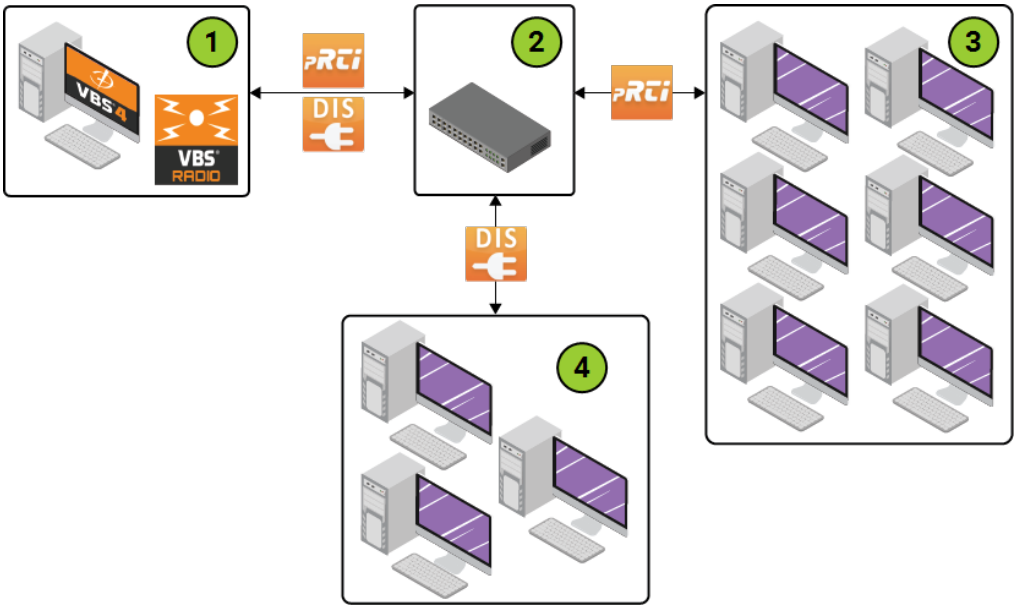
    Vehicles can be assigned a Vehicle Intercom Mode (PTT / VOX) for communication between the crew, see Advanced Settings and Presets in the VBS Radio Manual.

  - **Global Text Network**

    Players can communicate by text using the Radio Messenger dialog, see Communications Panel in the VBS Radio Manual.

## 10.8.2 VBS Radio Architecture

VBS Radio consists of several components across several computers on the network.




| No. | Computers | Description |
|---|---|---|
| 1 | **Admin Client / Dedicated Server** | The computer hosting the VBS4 mission, running VBS Radio in server mode, the Pitch Talk Admin Server, and the optional Pitch DIS Gateway. |
| 2 | **Router / Switch** | Shared network infrastructure. |
| 3 | **User Clients** | The trainee computers connected to the VBS4 mission, running VBS Radio in client mode, communicating with the host using Pitch pRTI. |
| 4 | **DIS Products** | **Optional:** Other simulation products using the DIS protocol, communicating with the host using Pitch DIS Gateway. |

### VBS Radio Component

VBS Radio is a core component of VBS4, which enables mission designers to define Radio Types, and Communication Channels, and save them as part of a VBS4 mission. The component communicates with the Pitch Talk Admin Server about the communication setup.

### Pitch Talk Admin Server

The Pitch Talk Admin Server runs on the computer hosting the VBS4 mission by default, or on a separate dedicated machine, and manages communication between VBS4 clients using Pitch pRTI.

### Pitch DIS Gateway

Pitch DIS Gateway is an optional application that connects to Pitch pRTI and translates the HLA protocol communication to the DIS protocol, to enable integrated communication with DIS-compliant products.

## 10.8.3 VBS Radio Licensing

VBS4 includes a free version of VBS Radio as standard, which provides out-of-the-box communication functionality.

The free version of VBS Radio has the following limitations:

- VBS4 is limited to five Radio Channels which are pre-defined as defaults in VBS4, and cannot be changed.

  **NOTE**
  The preset Radio Channel frequencies are restricted to VHF bandwidths only.

- VoIP networks that are pre-configured as defaults, and cannot be changed.

VBS Radio Pro is available on an additional per-seat license basis and provides the following additional capabilities:

- Creation of Radio Types with custom parameters.
- Unlimited channels. The Administrator can create any amount of channels, and choose any frequency for them.
- Radio Types can be assigned to any group of units. This means that:
  - Trainees can speak on one channel and also monitor audio on other channels.
  - Trainees can switch between radios in 1st / 3rd person view, enabling them to quickly communicate on multiple frequencies.
- HF and UHF frequencies are available in addition to VHF. Radio Types can be configured to support any of these frequency bands.
- Individual Communication Channel monitoring using Left and Right output channels.
- Simulation of weather degradation.

VBS Radio Standalone (on page 147) is a separate product, available on an additional per-seat license basis. It enables non-VBS users to communicate with participants in a VBS Radio scenario.

**FEATURE NOTICE**
For more information about VBS Radio Pro, contact sales@bisimulations.com.

## 10.8.4 VBS Radio Workflow Changes

VBS Radio is significantly updated since VBS3 18.3.0, and completely replaces VBS Radio in VBS3 18.2 and earlier.

In addition, the updated VBS Radio results in the following changes:

- VBS Radio starts by default. Options are available in VBS Launcher to disable VBS Radio or to provide additional debug logging information about VBS Radio.
- Physical radios are simulated. The representation of a physical radio which can be assigned to characters is called a *Radio Type*. For more information, see Configure Radio Types in the VBS Radio Manual.
    - As well as being assigned Communication Channels, a Radio Type must also be assigned to units for them to use that Communication Channel.
    - The frequency of Radio Channels must match the Frequency Range of the Radio Type assigned to units for these channels to be available to them.
    - Distance degradation is now a property of the Radio Type, not the channel.
- The Administrator assigns Radio Types to specific units.

## 10.8.5 VBS Radio Standalone

Bohemia Interactive Simulations provides a separate application, VBS Radio Standalone, to enable non-VBS4 users to communicate with VBS4 users participating in a VBS Radio scenario.

**FEATURE NOTICE**

VBS Radio Standalone is a licensed product. For more information, contact sales@bisimulations.com.

This topic describes the specific process to use VBS Radio Standalone connected to VBS4 running a VBS Radio scenario:

1. Deploy VBS Radio Standalone (below)
2. Configure VBS Radio Standalone (on the next page)
3. Using VBS Radio Standalone (on page 151)

**NOTE**

VBS Radio Standalone also supports use cases that do not require VBS4, and has additional configuration and usage options not described in this topic.

For more information, refer to the Pitch Talk User Guide in the VBS Radio Standalone installation `\docs\` folder.

### 10.8.5.1 Deploy VBS Radio Standalone

Bohemia Interactive Simulations distributes VBS Radio Standalone as a download package available from VBS License Manager or delivered directly by Customer Support.

Use the download package to install VBS Radio Standalone.

**Follow these steps:**

1. Navigate to the download folder and extract the download package.
2. Run `VBS_Radio_Standalone.Core.InstallerX64.version.exe`.

   The VBS Radio Standalone Installation Wizard opens.
3. Click **Next** to continue.
4. Review the License Agreement, and click **I Agree** to continue.
5. In the Choose Install Location panel, input or **Browse** for the **Destination Folder**.
6. Click **Next** to continue.

7. In the Choose Components panel, select the options to install:
   - Create Start Menu Shortcut
   - VBS Radio Standalone (mandatory)
   - Install Drivers
   - Firewall Exceptions

   **WARNING**

   Select **Install Drivers** and **Firewall Exceptions** if you are installing on a computer that does not already have VBS4 installed.
8. Click **Next** to continue.
9. Specify the **Start Menu Folder**, and click **Install**.
10. **Optional:** Select **Do not create shortcuts** to skip this step.

    The installer deploys VBS Radio Standalone to the selected folder and creates the selected shortcuts.
11. Click **Finish** to close the Installation Wizard.

### 10.8.5.2 Configure VBS Radio Standalone

To use VBS Radio Standalone to communicate with VBS Radio users in VBS4, configure its settings to connect to the same Pitch Talk Servers as specified by VBS4.

**WARNING**

If VBS Radio Standalone users are to be represented as entities in the VBS mission, apply URNs to those entities in VBS Editor Prepare mode. This can be done for any human entity, including invisible spectators.

On each VBS Radio Standalone client, configure the connection settings.

**Follow these steps:**

1. Start `VBSRadioStandalone.exe`.
2. Click the **Settings Button** to open the Settings dialog.

3. Select the **HLA Settings** tab, and specify the following settings:

| HLA Settings | Description |
|---|---|
| **Federation Name** | Specify **VBS Radio**. |
| **Pitch pRTI specific** | Select this option and specify the CRC Host and CRC Port. |
| **CRC Host and Port** | Specify the same IP Address and Port used as the **Federation Address** (`-pitchprtiserver`) specified when starting VBS4.<br><br>**NOTE**<br>If the VBS4 Host does not specify separate Pitch Servers, use the VBS4 Host IP Address and Port 8992.<br><br>For more information, see Starting VBS Radio in the VBS Radio Manual. |

4. Select the **User Identification** tab.

   Set the **Client Id:**

   **NOTE**

   This must be the same as the URN of the user / AI you want to connect to.

   **TIP**

   Multiple VBS Radio Standalone clients can use the same Client Id. Use this method for clients that use the same group of units.

   For example, if two separate clients are intended to communicate with members of the BLUFOR and Platoon A, they can use the same Client Id.

5. Click **OK**.

If you have not set URNs, enable the clients to connect on the VBS4 Host computer.

**Follow these steps:**

1. Start VBS4 as the administrator with VBS Radio enabled.
2. In the Battlespace Functions panel, go to **Execute**, and click **Host** to open the Networking Lobby.
3. Open a web browser at `localhost:9600` to open Pitch Talk.

4. Log in with **Name: admin** and **Password: admin**.

   Pitch Talk displays a Project with the name of your mission (only running MP missions are shown).

5. Click the mission name and select the **Users** tab.
6. For each Client Id configured in VBS Radio Standalone, click **New** to create a new user and use the following settings:

| Setting | Description |
|---|---|
| **Name** | Input the name used as the Client ID |
| **Identification Method** | Select **Client Id** and input the name used as the Client Id as the fingerprint.<br><br>**TIP**<br>Multiple VBS Radio Standalone clients can use the same Client Id. Use this method for clients that use the same group of units.<br>For example, if two separate clients are intended to communicate with members of the BLUFOR and Platoon A, they can use the same Client Id. |

7. Click **OK**.

   Pitch Talk adds the new user to the Users list.

8. Click the **redeploy project** icon.

VBS Radio Standalone is configured and connects to a VBS Radio scenario when the mission is started from a VBS4 Host using the same Federation Address and VBS Radio Standalone is turned on. Each user can communicate using the Networks and Channels assigned to the units assigned to them in Pitch Talk.

### 10.8.5.3 Using VBS Radio Standalone

When VBS4 hosts a VBS Radio scenario, VBS Radio Standalone connects to the same Federation Address when VBS Radio Standalone is turned on.

Use VBS Radio Standalone to communicate with users in the VBS Radio scenario.

**Follow these steps:**

1. Start `VBSRadioStandalone.exe` to open the VBS Radio Standalone UI.


2. Turn on the radio using the dial:
   - Select **PTT** to use Push-to-Talk communication with the **PTT** button.
   - Select **VOX** to use Voice Activation.

   VBS Radio Standalone connects to the mission and displays the first channel.

3. Select the channel to use by using the **PRE + / -** buttons to cycle through the channels set up for the VBS Radio scenario.
4. To use any available Chat channels, follow these steps:
   a. Expand **Chat**, and select the tab name for the Chat channel to use.
   b. Type your message, and click **Send**.

   For information about VBS Radio Chat, see Communications Panel in the VBS Radio Manual.

**TIP**

Hotkeys are available as keyboard shortcuts. Do the following:

1. Click the **Settings Button** to open the Settings dialog.

2. Select the **Hotkeys** tab.
3. Click **Set** for the applicable option and press the key to use as the keyboard shortcut.
4. Click **OK**.

# 10.9 VBS Blue IG

VBS4 can now act as a host and broadcast viewpoints to VBS Blue IG.

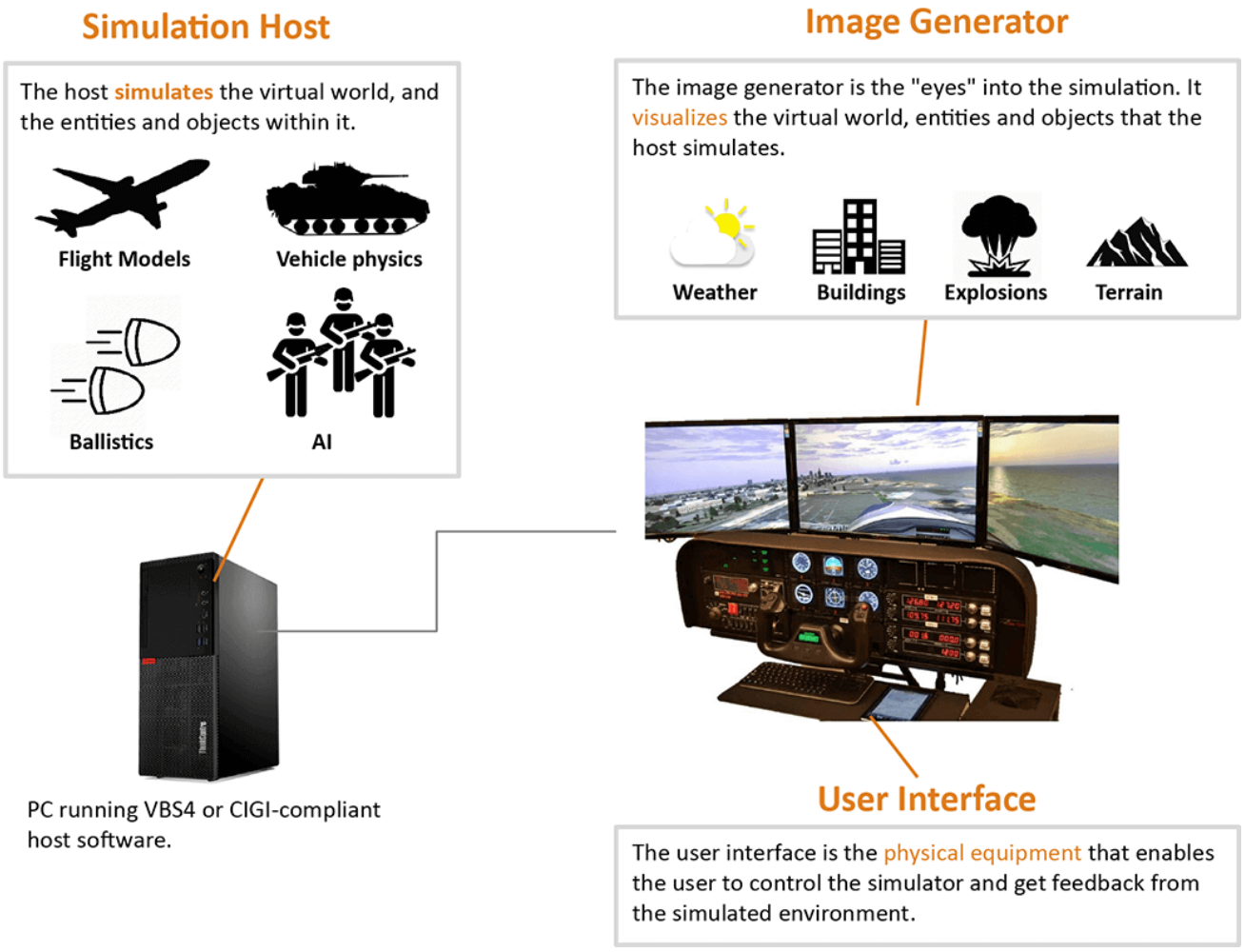
The VBS Blue Image Generator (VBS Blue IG) provides high-fidelity visualizations of data from VBS3, VBS4, and Common Image Generator Interface (CIGI) simulations. VBS Blue IG is a whole-earth rendering solution, eliminating the need to limit simulations to the confines of terrain databases. With this software, highly detailed insets can be combined with procedurally generated terrain and vegetation to simulate scenarios anywhere on earth.

Using the CIGI protocol, a simulation host such as VBS3, VBS4, or any compliant host connects to and controls the IG.

Designed to support high-performance computer image generation for the full range of military training and special operations applications, VBS Blue IG runs on standard, unmodified COTS hardware or scalable graphics systems.

The figure below illustrates how the simulator and image generator work together.

**Image-11: A basic overview of Simulators and Image Generators**



VBS Blue IG delivers highly realistic visual and sensor scenes, with long-view distances and large numbers of moving entities on a whole-world terrain, while enabling a single IG to be utilized in Air, Sea and Land domains.

**Image-12: Several IG outputs blended to project a seamless image on to a dome**

For more information, see the VBS Blue IG Manuals and Quick Start: VBS Blue IG with VBS4 Host in the VBS4 Administrator Manual.

# 10.10 VBS Simulation SDK

Bohemia Interactive Simulations provides a software development kit to enable VBS customization. VBS Simulation SDK enables developers to customize and extend VBS by providing an API and suite of tools. VBS Simulation SDK includes core and simulation-specific APIs, and a copy of the VBS Control Editor, Bohemia Interactive Simulations advanced artificial intelligence behavior editing toolkit.

VBS Simulation SDK provides low-level and direct access to the VBS engine without any intermediate layers. The APIs included with VBS Simulation SDK cover everything from basic application control to mission management to environment settings. VBS Simulation SDK is ready to meet many use cases: take control of and define the path of any projectile or just create the projectile path as you see fit; disable the simulation for a vehicle and control its behavior by integrating your own solution; enhance your VBS experience with easy-to-use 3D world and screen drawing APIs.

**WARNING**

VBS Simulation SDK supersedes the Application Scripting Interface (ASI) as the primary method to customize and extend the functionality of VBS. We no longer recommend creating plugins using the ASI.

As VBS Simulation SDK capabilities grow, other new APIs covering different aspects of the VBS functionality will be added such as custom sensor optics, terrain mesh queries, and multiplayer control management. The VBS Simulation SDK also provides support for direct access to the VBS Control actors and behaviors through VBS Control-specific APIs, support for HTML-based user interfaces, and updated VR / XR interface listeners.

To learn more about the most recent additions and updates to the latest VBS Simulation SDK release, please refer to the Changelog section in the VBS Simulation SDK Manual.

**FEATURE NOTICE**

VBS Simulation SDK is a separately licensed product. For more information, contact sales@bisimulations.com.

For a detailed introduction to VBS Simulation SDK, visit: https://bisimulations.com/products/vbs-simulation-sdk.

# 10.11 VBS Developer Suite

Bohemia Interactive Simulations provides the VBS Developer Suite as a separate product, which enables you to create custom models and configure their simulation behavior using proprietary and industry-standard tools.

The VBS Developer Suite provides the following primary tools and utilities:

- For model development, Model Exchanger (MEx) provides a set of utilities to convert models created in industry standard formats, such as FBX, GLTF, or GLB, to the proprietary P3D format used in VBS4.
- Addon Packer provides a one-click method to pack and binarize content into the proprietary PBO format required by VBS, and also provides encryption to CBO format to protect content.
- A set of Miscellaneous Tools enables you to create specific model types and convert various model files and textures for use in VBS.

Included in your VBS Developer Suite installation is the VBS Developer Suite Reference. This documentation contains a set of complimentary manuals which discuss the various aspects of model creation and configuration that are necessary for the successful import of custom content into VBS. The included manuals are listed in the following table.

| Manual | Description |
|---|---|
| **VBS Developer Suite Overview** | This manual introduces you to the various tools, files, processes, inheritance theory, and packing procedures employed by those wishing to add their own content to VBS. |
| **Model Exchanger** | This manual introduces the Model Exchanger (MEx) application, which is required for to import and maintain model content for Bohemia Interactive Simulations products. It is the primary application in the VBS Developer Suite. It serves as a platform for various plugins that are dedicated to specific tasks.<br>In addition, the MEx UI, its capabilities, and the various LOD types available for successful model creation are discussed in detail. |
| **Importing Assets** | This manual contains full tutorials and single topics, which provide step-by-step instructions about how to import models from commercial modeling tools and properly configure them for VBS4.<br>In addition, how to apply detail and effects is discussed, together with the Universal Component System (UCS), adding vehicle systems, and creating UI elements. |
| **Configuration Manual** | This manual contains all of the classes and parameters used by VBS to enable you to successfully create `Model.cfg` and `Config.cpp` files, which are essential for defining the characteristics, capabilities, and animation functionality of your models for use in VBS. |
| **Miscellaneous Tools** | This manual contains a sub-set of smaller manuals which cover various exclusive tools that are used for specific tasks, including: Face Editor, Model Converter, and more. |

# 10.12 WIBU Licensing

Bohemia Interactive Simulations use a proprietary licensing management system, VBS License Manager using WIBU CodeMeter licensing, to provide customers with greater flexibility, and to help reduce license administration overhead.

WIBU CodeMeter is a license management and code protection system. WIBU enables the secure and simple distribution and update of software licenses. The new license management system significantly reduces the management and administrative overhead that military and simulation industry customers have traditionally carried for license management.

- WIBU enables Bohemia Interactive Simulations to rapidly deliver licensing with the purchase of software products, so that your personnel can start training faster. You no longer have to wait for a physical dongle to arrive in the mail.
- The new system also provides the capability to update licensing in classified networks.
- You can download products directly from the user-friendly VBS License Manager.
- You can receive and update dongles and servers in both online and offline environments.
- WIBU eliminates the need to work with a physical dongle and can be attached to specific PCs, avoiding the possibility of lost or missing dongles.
- More information on licenses such as support dates is available in the new web interface.

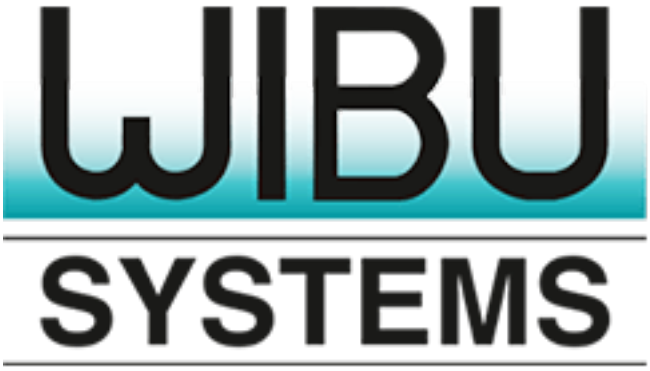
Using VBS License Manager and WIBU for license management does not affect how Bohemia Interactive Simulations products run.

WIBU licensing and VBS License Manager simplifies license management in the following ways:

- Significantly fewer physical dongles are needed under WIBU Codemeter. Customers may only need new dongles when they are updating licenses in an offline environment. Licenses can be associated with specific machines or floating licenses may be managed by a License Server. Licenses can be updated or added without dongles in an online environment.
- An internet connection is typically only necessary for the initial setup of a License Server, although offline License Server use cases are also supported. Individual computers can remain offline so long as the license is not a timed license. Offline LANs can receive Bohemia Interactive Simulations software products through manual license transfer to servers installed on their LANs. BISim Customer Support is available to assist with this delivery type.
- When a component needs to be replaced on a computer, Bohemia Interactive Simulations can re-register the license, provided the customer purchased the license as perpetual or the timed license is still valid under terms of the agreement.

For any queries about WIBU licensing, contact wibu.support@bisimulations.com.

For more information managing WIBU licenses for Bohemia Interactive Simulations products, see the VBS License Manager documentation.



# 11. VBS Use Cases Documentation

VBS4 supports a wide range of specific training needs, including all VBS3 training use cases.

To better support these capabilities, this documentation includes a set of topics describing in more detail how to prepare and execute scenarios that use specific functionality of VBS4:

**General Use Cases:**

- Convoys (on page 161)
- Enemy Ambush (on page 173)
- Improvised Explosive Device Ambush (on page 189)
- Route Clearance (on page 199)

Each of these uses cases includes a step-by-step procedure to create a basic example scenario demonstrating the use case. Follow the instructions to create these scenarios.

> **NOTE**
>
> These use cases are also available as PDFs in your installation in the following folder:
>
> `\docs\PDF\UseCases\`

The Scenarios used in these use cases are also available as sample Battlespaces, predeployed on VBS World Server or in the installation folder of your VBS4 Client:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

Compare your version of the scenario to the sample by deploying the sample Battlespace to VBS4.

**Follow these steps:**

- For Online use cases, do the steps in Copy Battlespace (below) on the VBS World Server computer, and then synchronize the Battlespace on the VBS4 Client connected to VBS World Server.
- For Offline use cases, copy the Battlespace from the `\optional\` folder.

  **Copy Battlespace**

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`
  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (on page 83) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (on page 80) using **UseCase** as the filter.

Select the sample Battlespace and select **Prepare > Editor > Open** to review the Scenario using VBS Editor.

This set of documented use cases will expand over time to cover topics within the wide range of training needs that our customers have developed for VBS3 and VBS4. A small sample of the over 200 use cases that have been developed include the following:

| | | | |
|---|---|---|---|
| **IED Training** | **Driver Training** | **Radio Procedures** | **Aircraft Part-Task Trainer** |
| **Parachuting** | **Vehicle Checkpoint** | **Crew Served Weapons** | **Ship Familiarization** |
| **Navigation** | **First Response** | **Surveillance Systems** | **Vehicle and Object Search** |
| **Vehicle ID** | **Crew Training** | **Medical - First Aid** | **Rules of Engagement** |
| **UAV Training** | **UGV Training** | **Cultural Awareness** | **Enemy Mindset Training** |
| **Sensor Training** | **Lessons Learned** | **Intelligence Training** | **Aircraft-Ground Simulation** |
| **CBRN** | **Vehicle Recovery** | **Engineer Training** | **Medical - CASEVAC** |
| **Sniper Training** | **Convoy Training** | **Route Clearance** | **Ops Room / Staff Training** |
| **Vehicle Systems** | **Mission Rehearsal** | **FO/JTAC Training** | |

VBS4 extends and improves many of these use cases through its Whole-Earth Terrain representation, including use cases related to fast air (for example, part-task training, close air support, and mission rehearsal). And with the new interfaces, VBS Geo and VBS Plan, scenarios can be built more quickly allowing for more varied training and agile adaptation to reflect new training objectives (more *Bloodless Battles*).

The powerful VBS simulation engine has been further extended in VBS4, including an updated physics simulation to increase realism across its massive number of support training use cases. All VBS3 features, such as soldier fatigue simulation, unmanned vehicles, and accurate and weapon-specific ballistics, have been ported to VBS4.

In addition, these manuals contain more specific capabilities developed for customer projects that are available as functionality in VBS4.

**Customer Specific Capabilities:**



# 11.1 Convoys

The purpose of this guide is to simulate a convoy, which is defined as a group of vehicles traveling together, for mutual support and protection. Often, a convoy has an armed defensive support.

There are four types of convoy simulation:

| Convoy Simulation | Description |
|---|---|
| Full AI Convoy | All the convoy crew members are AI-controlled. |
| AI and Player Convoy | Part of the convoy crew members are AI-controlled, while another part is player-controlled. |
| Full Player Convoy | All the convoy crew members are player-controlled. |
| Scripted Convoy | The convoy crew is controlled using SQF scripts. |

AI convoys may be controlled by the VBS AI or the Control AI.

For a walkthrough example of a simple convoy scenario, see the following:

- Control AI Convoy Example (below)

The general workflow of a convoy scenario in VBS4 contains two parts:

- Convoy Preparation (on page 169)
- Convoy Execution (on page 171)

## 11.1.1 Control AI Convoy Example

You can create a full Control AI convoy, and give it a Convoy Order.

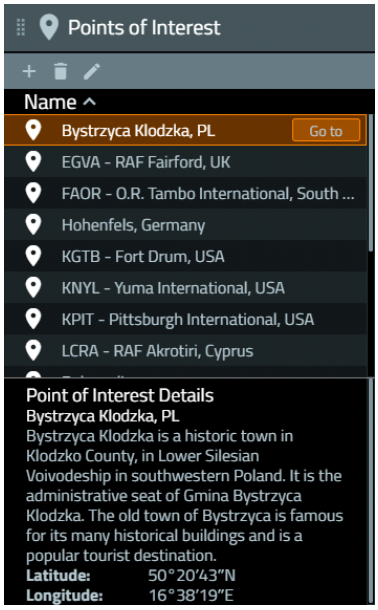
**Follow these steps:**

1. In the VBS4 Toolbar of the Battlespaces Mode, select the **Battlespaces** tab.

   **NOTE**
   When starting the VBS4 Admin Client, the Battlespaces tab is selected by default.

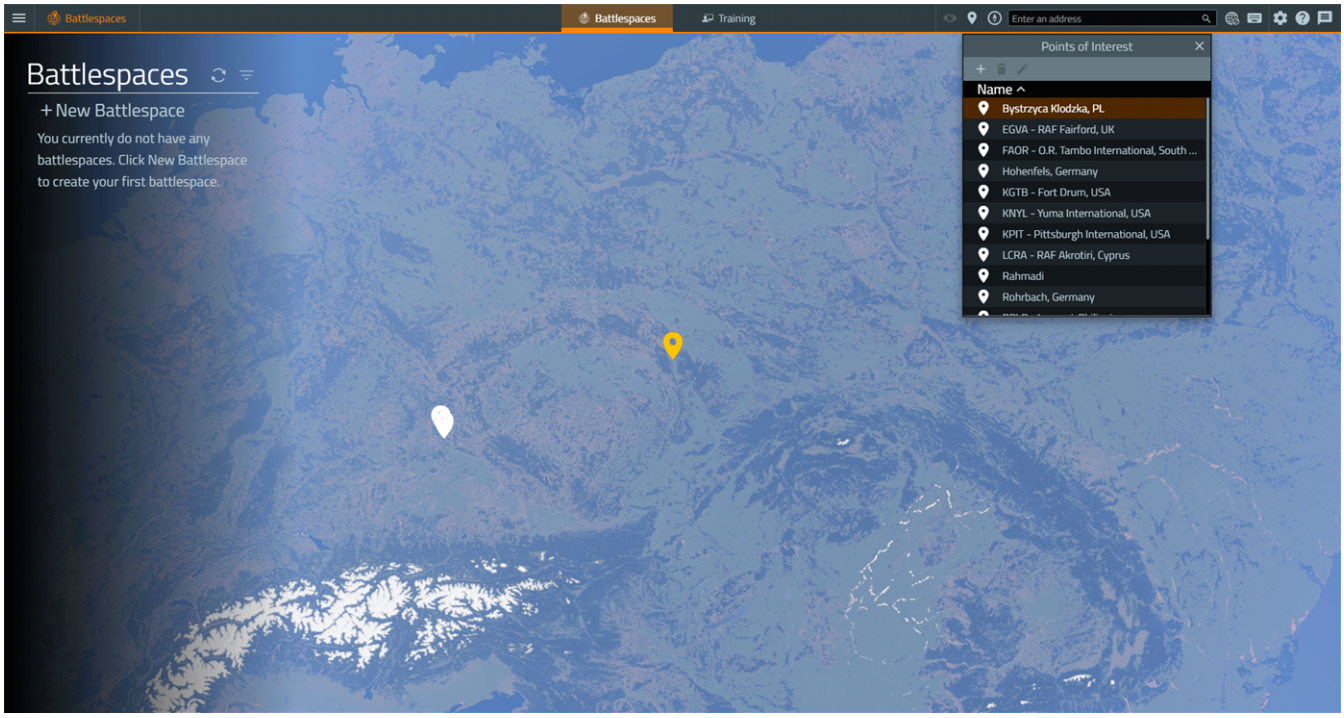
2. Click the **POI Icon**.

The Points of Interest Panel opens.




3. In the Points of Interest Panel, select **Bystrzyca Klodzka, PL**, and click **Go to**.

The Whole-Earth Terrain rotates directly above the Bystrzyca Klodzka terrain in Poland.



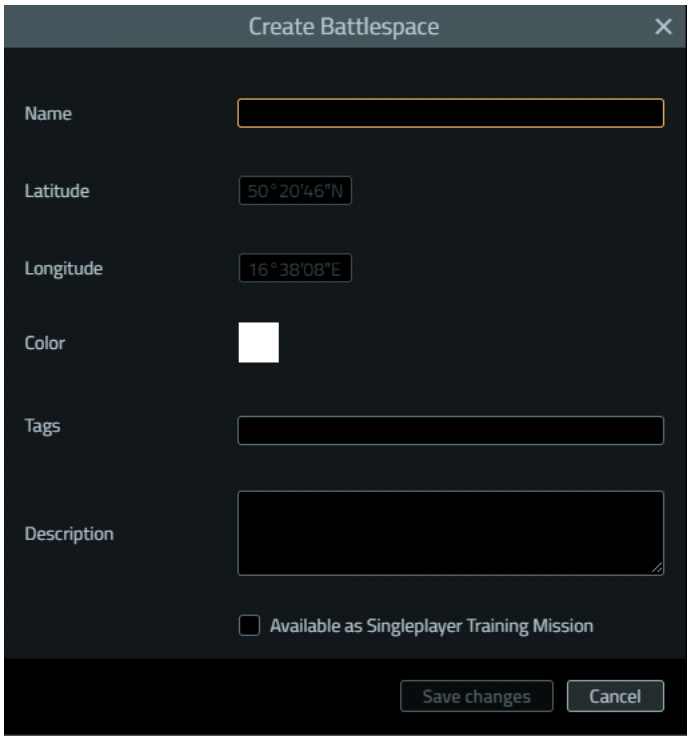

 

4. In the Search Bar of the VBS4 Toolbar, input the coordinates **50°20'46"N, 16°38'08"E**, and then press **Enter**.

   Use the **Mouse Scroll Wheel** to zoom in to view the area displayed in the following image:

5. Click **+ New Battlespace** and click the location of the **yellow** circle.

   The Create Battlespace dialog opens, displaying the selected coordinates.



6. Input the following details in the Create Battlespace dialog:

| Parameter | Value |
|---|---|
| **Name** | My_Convoys |
| **Color** | **Green** #36b82c |
| **Tags** | MyUseCase |
| **Description** | Convoys Use Case |

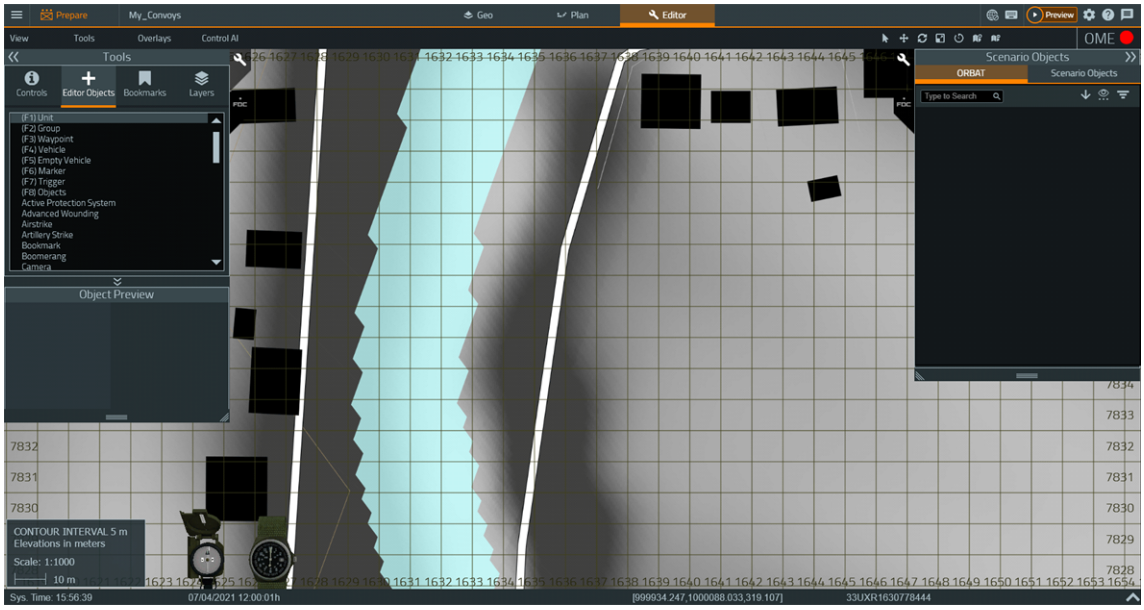
7. Click **Save Changes**.

   VBS4 adds the Battlespace to the Battlespaces List.


8. Select the newly created **My_Convoys** Battlespace to show a **green** icon added to the Whole-Earth Terrain in the designated location.

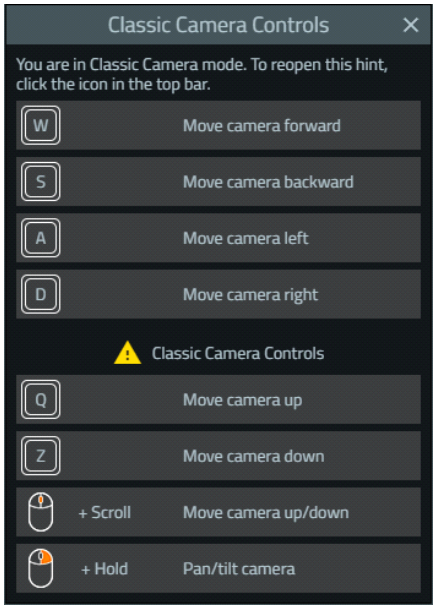
9. Under **Prepare > Editor**, click **Create**.

   The Battlespace opens in VBS Editor (Prepare Mode) in the 2D View.




> **TIP**
>
> If required, toggle terrain textures in the 2D View, select **View > Hide / Show Texture**.

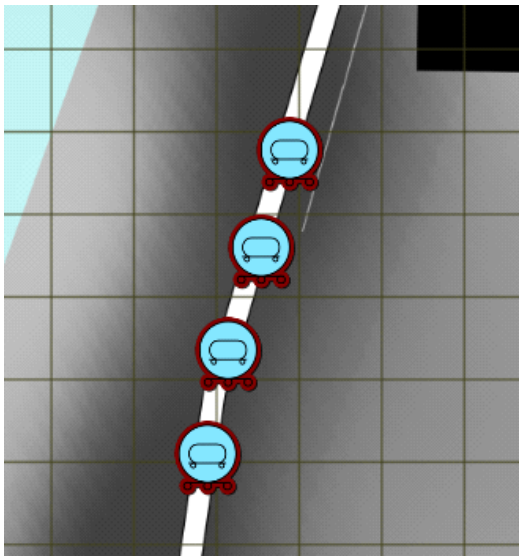
   Use the Classic Camera Controls to move the camera:




10. In the Tools Panel, select **(F4) Vehicle**, and click a location on the white road, where you want the lead convoy vehicle to be.
11. In the Object Properties dialog, select the **US Army Wheeled - Woodland > M1114 HMMWV** vehicle.

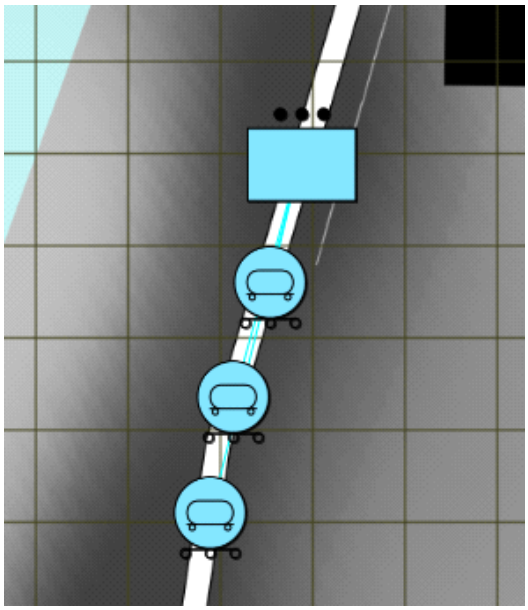
12. Select **Control AI** as the AI type, and click **OK**.
13. Place three more convoy vehicles south of the lead vehicle, along the road.

    The convoy vehicles should look like this:



14. Link each of the three bottom vehicles with the lead vehicle:
    a. Hold **LShift** and click any of the three bottom vehicles.
    b. Click the lead vehicle.

    The convoy vehicles now form a group.

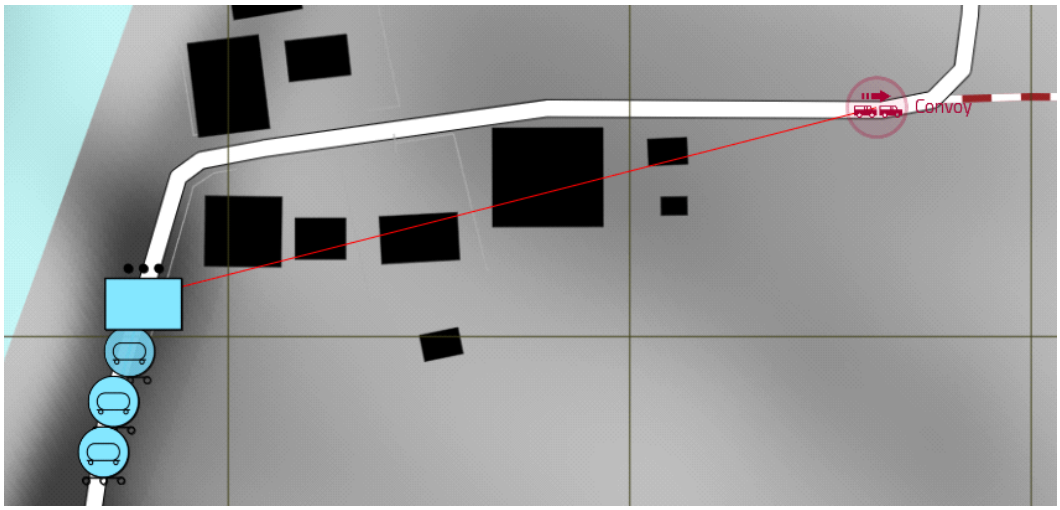


15. Hold **LShift**, click the lead vehicle, and click a location on the map, northeast up the road, where you want your convoy to drive.

    The Control AI - Waypoints Object Properties dialog opens.

16. In the Object Properties dialog, in the **Behavior** list, select **Convoy** (leave the other settings as they are) and click **OK**.

    The Convoy Order appears on the map.

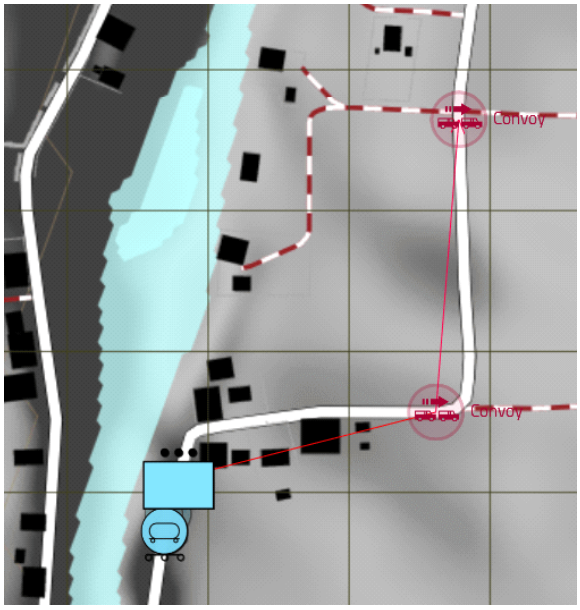



17. Hold **LShift**, click the Convoy Order, and click a location on the map, north up the road, where you want the second Convoy Order to be.

    The Control AI - Waypoints Object Properties dialog opens.

18. In the Object Properties dialog, in the **Behavior** list, select **Convoy** (leave the other settings as they are) and click **OK**.

    The second Convoy Order appears on the map.




19. In the Tools Panel, select **(F1) Unit** and place a **VBS Objects > Invisible spectator (walking)** Player unit, anywhere on the map, where the Scenario takes place.

20. Expand the **Main Menu**, and under **Battlespaces**, select **Save**.

    The Scenario is saved.

21. Click **Preview** to preview the Scenario.
22. Press **Pause** (**Esc**) and in the VBS4 Toolbar, select **Editor** and press **Map** (**M**), to switch to the 3D View.

Observe the vehicle convoy driving to its first and second Convoy Order destination.

**NOTE**

The Convoys Scenario is also available as a sample Battlespace on VBS World Server or in:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

Compare your version of the scenario to the sample by deploying the sample Battlespace to VBS4.

**Follow these steps:**

- For Online use cases, do the steps in Copy Battlespace (below) on the VBS World Server computer, and then synchronize the Battlespace on the VBS4 Client connected to VBS World Server.
- For Offline use cases, copy the Battlespace from the `\optional\` folder.

  **Copy Battlespace**

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (on page 83) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (on page 80) using **UseCase** as the filter.

Select the sample Battlespace and select **Prepare > Editor > Open** to review the Scenario using VBS Editor.

## 11.1.2 Convoy Preparation

As an administrator, use VBS Editor in Prepare mode to create a Convoy Scenario.

**Follow these steps:**

1. Use VBS Editor to create a new Scenario, or edit an existing one.
2. VBS4 has vehicles with specific convoy functionality, including the following:

| Vehicle | Description |
|---|---|
| VBS Vehicle | Any vehicle that has a VBS AI or player-controlled driver (set to **Player** or **Playable**). |
| Control AI Vehicle | Any vehicle that has a Control AI driver.<br>For Control AI convoys, see Convoy AI in the VBS4 Editor Manual.<br>**WARNING**<br>Players cannot take control of Control AI vehicles. |

   Add vehicles to the scenario.

   For more information on placing vehicles, see Adding Vehicles in the VBS4 Editor Manual.

3. Add additional objects and equipment.

   VBS4 includes a specific set of Editor Objects and equipment for Convoy scenarios:

| Additional Object / Equipment | Description |
|---|---|
| Road Signs | Road signs can be used to regulate convoy movement. For more information, see Military Road Signs - Scenario Design in the VBS4 Editor Manual.<br>**NOTE**<br>Road signs are only used for guidance by players in the simulation, and affect neither VBS AI nor Control AI convoys. |

4. **Full AI Convoy** - In the case of a fully AI-controlled convoy, do the following:
    a. Make sure that all crew members are in the convoy vehicles (see step 2 of the procedure, and the difference between **(F4) Vehicle** and **(F5) Empty Vehicle** in the Editor Objects List).
    b. Make sure that all the vehicle crew members are AI-controlled. For more information, see the AI options in Edit Vehicle Options in the VBS4 Editor Manual.
    c. Link the convoy vehicles into a group. For more information, see Creating and Adding to Groups with Links in the VBS4 Editor Manual.
    d. Add convoy Waypoints:
        - In the case of Control AI, add Control AI Waypoints. For more information, see Control AI Waypoints in the VBS4 Editor Manual.
        - In the case of VBS AI, add VBS Waypoints. For more information, see Assigning Behavior Using Waypoints in the VBS4 Editor Manual.
5. **AI and Player Convoy** - In the case of a convoy with a mix of AI and player-controlled units, do the following:
    a. Make sure that all crew members are in the convoy vehicles (see the previous procedure step, and the difference between **(F4) Vehicle** and **(F5) Empty Vehicle** in the Editor Objects List).
    b. Set the vehicle crews to either **Game AI / Control AI** or **Player** / **Playable** (see Adding Units in the VBS4 Editor Manual).
    c. Link the convoy vehicles into a group.

    > **WARNING**
    > It is not possible to mix Control AI and Player units in a group.

    d. Add a convoy Waypoint to Game AI / Control AI crew vehicles:
        - In the case of Control AI, add Control AI Waypoints. For more information, see Control AI Waypoints in the VBS4 Editor Manual.
        - In the case of VBS AI, add VBS Waypoints. For more information, see Assigning Behavior Using Waypoints in the VBS4 Editor Manual.

6. **Full Player Convoy** - In the case of a convoy that consists only of player-controlled units, do the following:
   a. Place vehicles and crews.

   > **NOTE**
   > Vehicles and crews do not need to be linked to form groups, and crews can start the scenario outside the vehicles.

7. **Scripted Convoy** - You can use any SQF scripts to control the convoy.

   For example, you can use the **Initialization Statements** of a unit to instantaneously place the unit in a vehicle as:

   - Driver - moveInDriver (https://sqf.bisimulations.com/display/SQF/moveInDriver)
   - Gunner - moveInGunner (https://sqf.bisimulations.com/display/SQF/moveInGunner)
   - Commander - moveInCommander (https://sqf.bisimulations.com/display/SQF/moveInCommander)
   - Cargo - moveInCargo (https://sqf.bisimulations.com/display/SQF/moveInCargo)

   For more information, see Using Basic Scripts in the VBS4 Scripting Manual.

8. Preview and save the mission.

   For more information, see Scenario Preparation (on page 85).

### 11.1.3 Convoy Execution

Once the Convoy Scenario is prepared by the administrator, it can be executed.

Start the Scenario and open VBS Editor.

For more information, see Scenario Execution (on page 89).

Use the Editor UI to modify the scenario as it runs.

A typical convoy scenario has the following phases:

1. If the crew members are not in the vehicles, they enter them, occupying the required positions (driver / commander / gunner / cargo).
   - For AI units, Waypoints can be used to get to and enter vehicles.

     For more information, see Assigning Behavior Using Waypoints (for VBS AI) and Control AI Waypoints (for Control AI) in the VBS4 Editor Manual.
   - For role-playing, players use movement controls and 3D World Actions (see Interact with Vehicles Interface (IWV) in the VBS4 Trainee Manual) to enter vehicles.

2. The vehicles in the convoy drive.
    - Players can do the following:
        - As drivers, drive the vehicles. For more information, see Land Vehicle Controls in the VBS4 Trainee Manual.
        - As group leaders / vehicle commanders, order AI drivers where to go:

          As a group leader, click the map to order a vehicle to move to a position.

          As a subordinate vehicle commander, use the Command Menu to order the vehicle driver to return to formation.

          For more information, see Commanding Subordinates in the VBS4 Trainee Manual.
        - Switch vehicle positions and assume different roles to control the vehicle. For more information, see Interact with Vehicles Interface (IWV) in the VBS4 Trainee Manual.
        - Use radio communication. For more information, see VBS Radio Overview (on page 141).
        - Use road signs to regulate convoy movement. For more information, see Military Road Signs in the VBS4 Trainee Manual.
    - The AI can:
        - Follow Waypoints. See Assigning Behavior Using Waypoints (for VBS AI) and Control AI Waypoints (for Control AI) in the VBS4 Editor Manual.
        - Use traffic lights and take civilian traffic and pedestrians into account.

          For more information, see Civilian AI in the VBS4 Editor Manual.

# 11.2 Enemy Ambush

This use case simulates a general enemy ambush, using role play (player control) and AI.

For IED Ambush, see the Improvised Explosive Device Ambush (on page 189) use case documentation.

For a walkthrough example of a simple Enemy Ambush scenario, see the following:

- AI on Rails Enemy Ambush Example (below)

The general workflow of an Enemy Ambush simulation in VBS4 contains two parts:

- Enemy Ambush Preparation (on page 184)
- Enemy Ambush Execution (on page 185)

For Enemy Ambush examples that have Preparation and Execution phases, see the following:

- Enemy Ambush with Triggers and Waypoints (on page 186)
- UPR Enemy Ambush (on page 187)

## 11.2.1 AI on Rails Enemy Ambush Example

You can create an Enemy Ambush scenario with AI on Rails, which is similar to Unit Path Recording (UPR), but works with Control AI entities and is easier to use.

> **NOTE**
>
> To use AI on Rails, make sure that the Enemy Ambush group is set to **Control AI**. For more information, see Control AI Waypoints in the VBS4 Editor Manual.

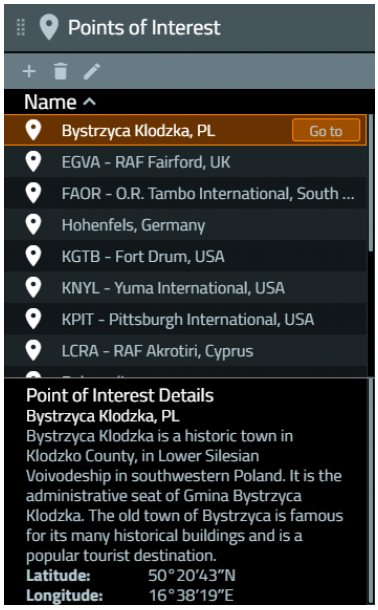
**Follow these steps:**

1. In the VBS4 Toolbar of the Battlespaces mode, select the **Battlespaces** tab.

   > **NOTE**
   >
   > When starting the VBS4 Admin Client, the Battlespaces tab is selected by default.

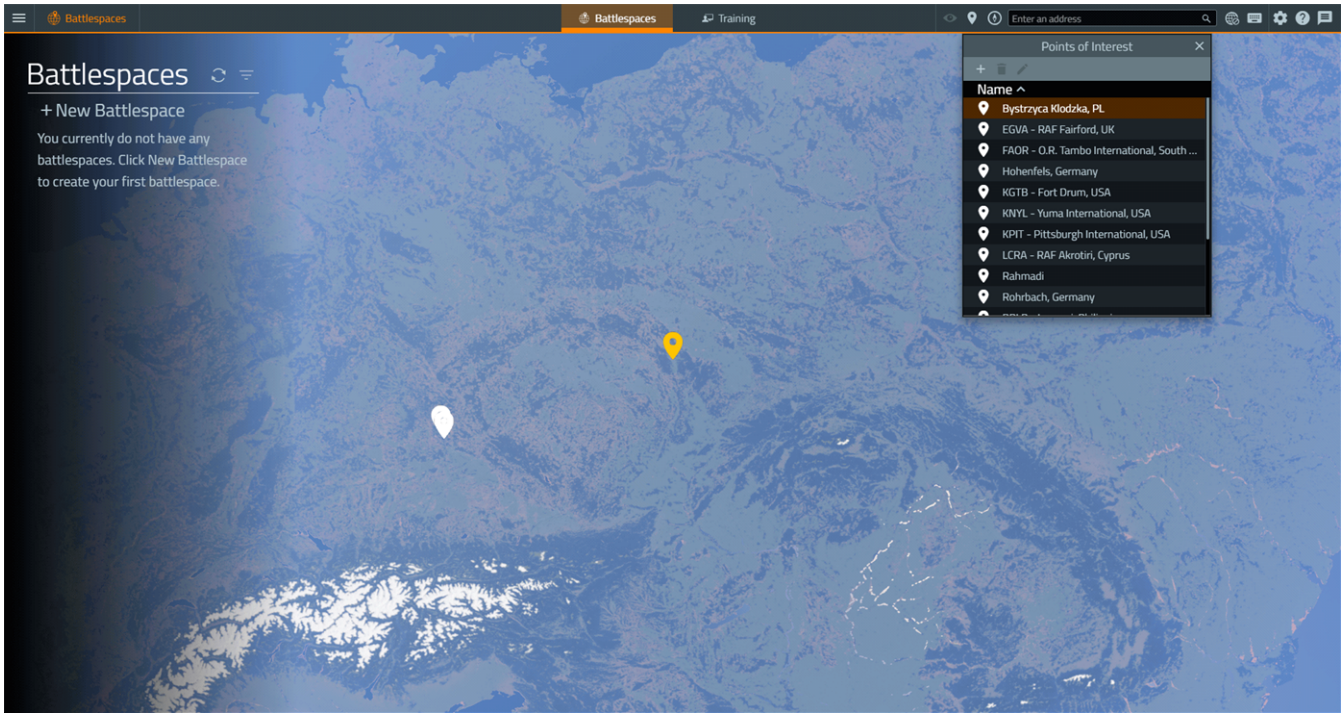
2. Click the **POI Icon**.

The Points of Interest Panel opens.




3. In the Points of Interest Panel, select **Bystrzyca Klodzka, PL**, and click **Go to**.

The Whole-Earth Terrain rotates directly above the Bystrzyca Klodzka terrain in Poland.



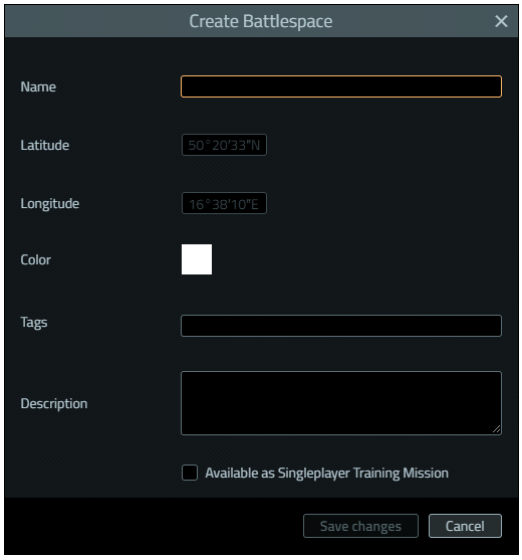

 

4. In the Search Bar of the VBS4 Toolbar, input the coordinates **50°20'34"N, 16°38'10"E**, and then press **Enter**.

   Use the **Mouse Scroll Wheel** to zoom in to view the area displayed in the following image:

5. Click **+ New Battlespace** and click the location of the **yellow** circle.

   The Create Battlespace Dialog opens, displaying the selected coordinates.




6. Input the following details in the Create Battlespace dialog:

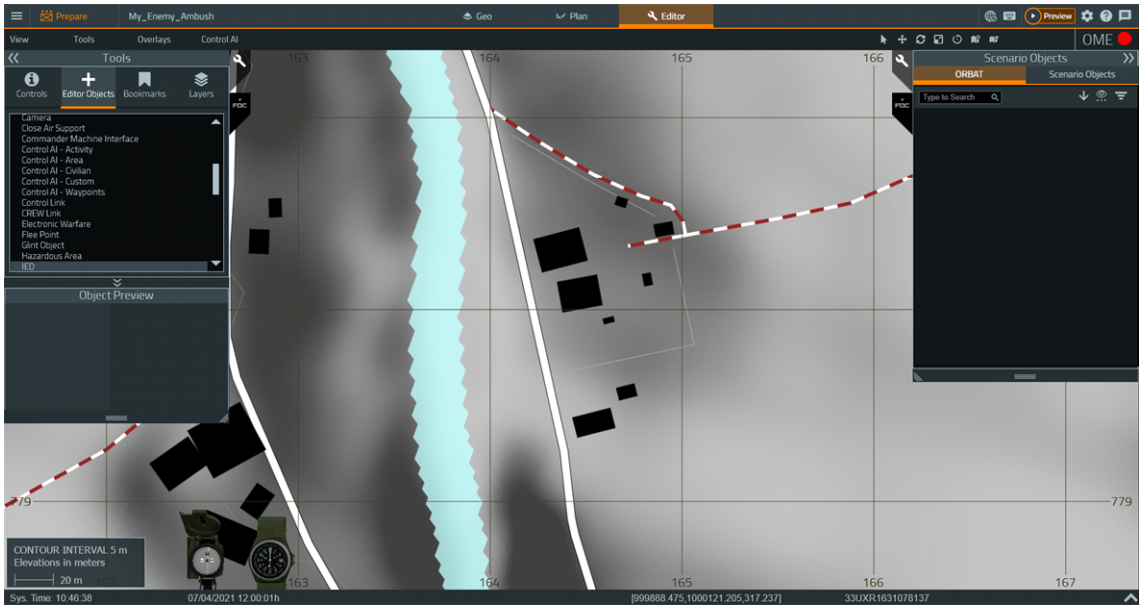
| Parameter | Value |
|---|---|
| **Name** | My_Enemy_Ambush |
| **Color** | **Green** #36b82c |
| **Tags** | MyUseCase |
| **Description** | Enemy Ambush Use Case |

7. Click **Save Changes**.

   VBS4 adds the Battlespace to the Battlespaces List.


8. Select the newly created **My_Enemy_Ambush** Battlespace to show a **green** icon added to the Whole-Earth Terrain in the designated location.
9. Under **Prepare > Editor**, click **Create**.

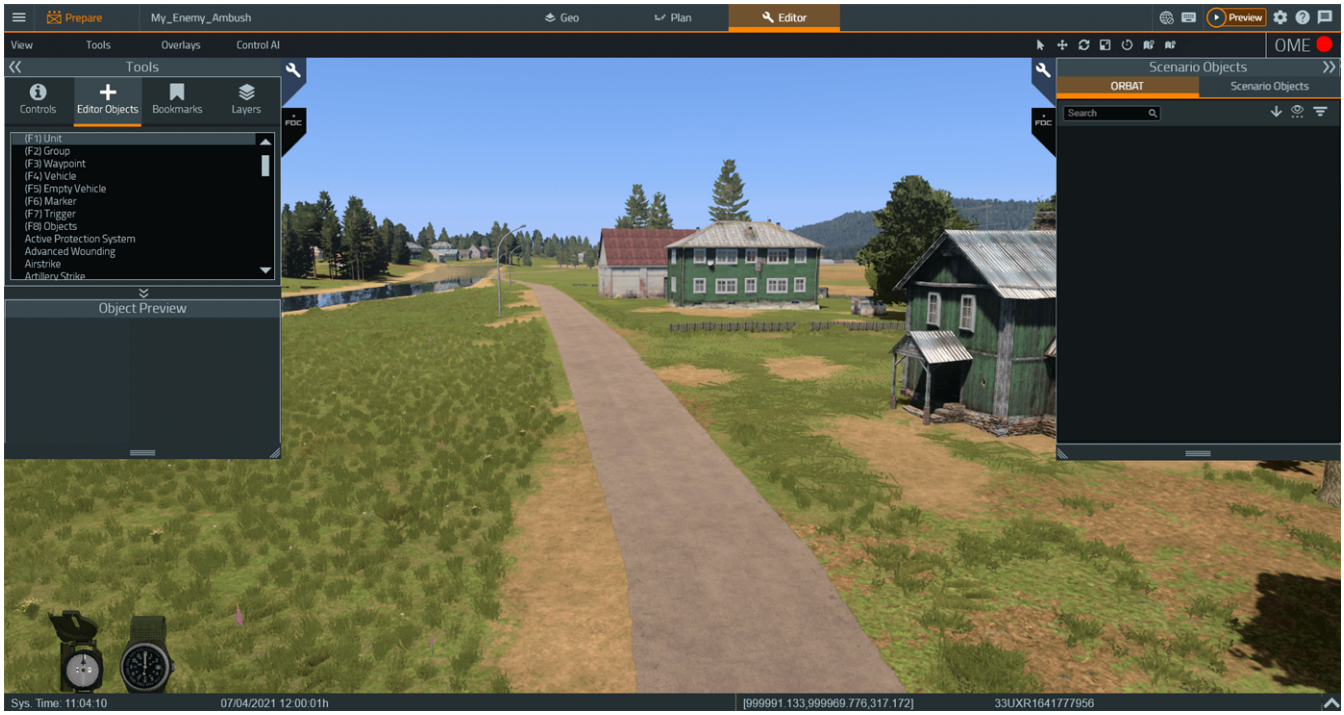
   The Battlespace opens in VBS Editor (Prepare mode) in the 2D View.



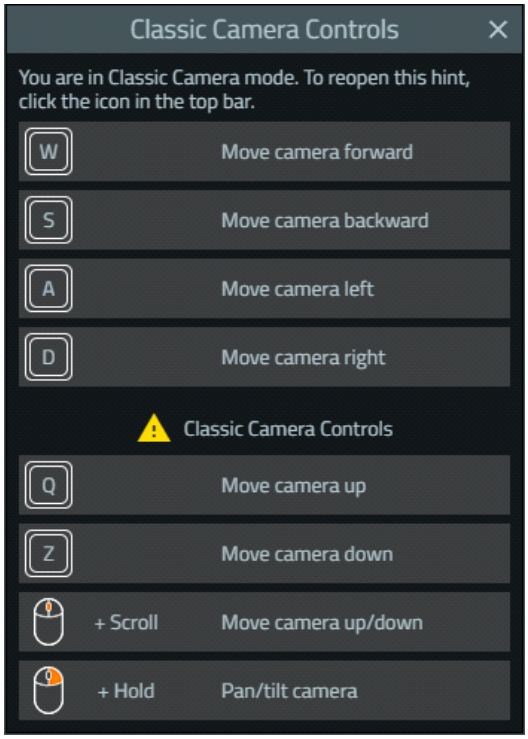

**TIP**

If required, toggle terrain textures in the 2D View, select **View > Hide / Show Texture**.

10. Press **Map** (**M**) to switch to the 3D View of VBS Editor, and move the camera to the south, so that three houses are in view to the right of the road, as indicated in the following image:




Use the Classic Camera Controls to move the camera:

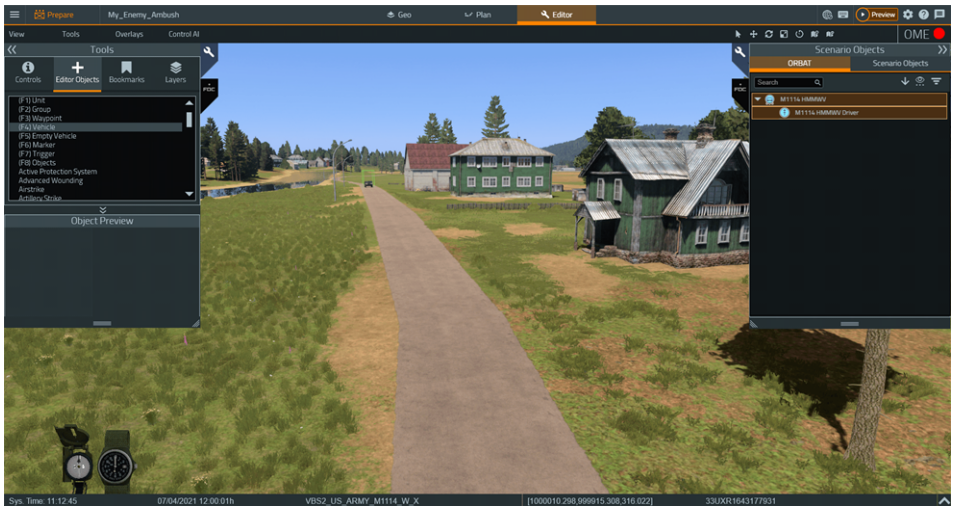



11. In the Tools Panel, select **(F4) Vehicle**, and click a location on the road, north of the farthest house, to place a BLUFOR vehicle.

12. In the Object Properties dialog, select the **US Army Wheeled - Woodland > M1114 HMMWV** vehicle.
13. Select **Control AI** as the AI type, and click **OK**.

    The BLUFOR vehicle is placed.
14. Hold **LShift + RMB** and move the mouse left / right to rotate the vehicle, so that it aligns with the road, facing south. Press **Map** (**M**) to switch between 2D / 3D View.

    The vehicle is positioned as indicated in the following image:



15. Hold **LShift**, click the vehicle, and click a location on the map, after the southernmost house in view, where you want the vehicle to drive.

    The Control AI - Military Object Properties dialog opens.
16. In the Object Properties dialog **Behavior** drop-down, select **Convoy** (leave the other settings as they are) and click **OK**.

    A Convoy Order appears on the map.

17. Press **Map** (**M**) to switch to the 2D View.

18. In the Tools Panel, select **(F7) Trigger**, and double-click using **LMB** on a location to the south of the vehicle opposite the second house down the road.

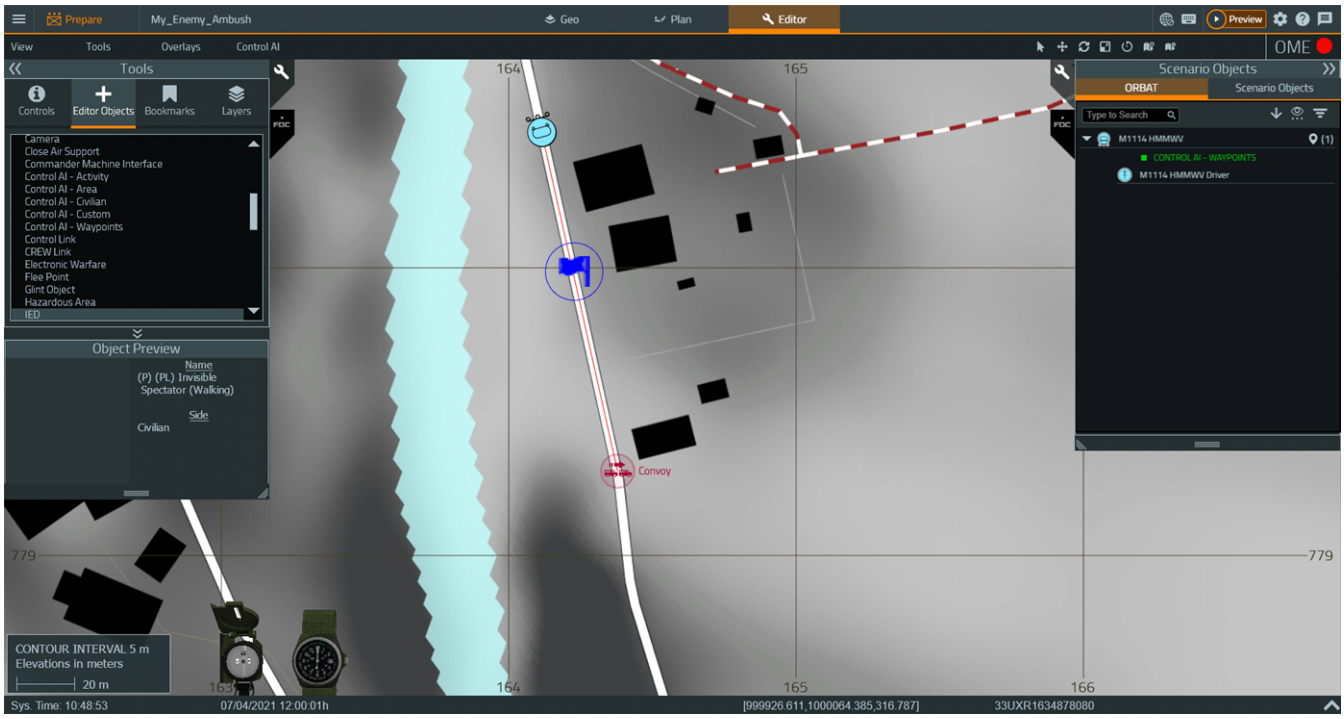
    The Trigger Object Properties dialog opens.

19. In the Object Properties dialog, set the following properties:

    - **Size (Left-Right):** 10
    - **Size (Up-Down):** 10
    - **Activation:** BLUFOR
    - **Activation Type:** Present

20. Click **OK**.

    A Trigger appears on the map.




21. Press **Map** (**M**) to switch to the 3D View.

22. In the Tools Panel, select **(F1) Unit**, and click a location behind the southernmost house, so that the location is obscured from view to the vehicle.

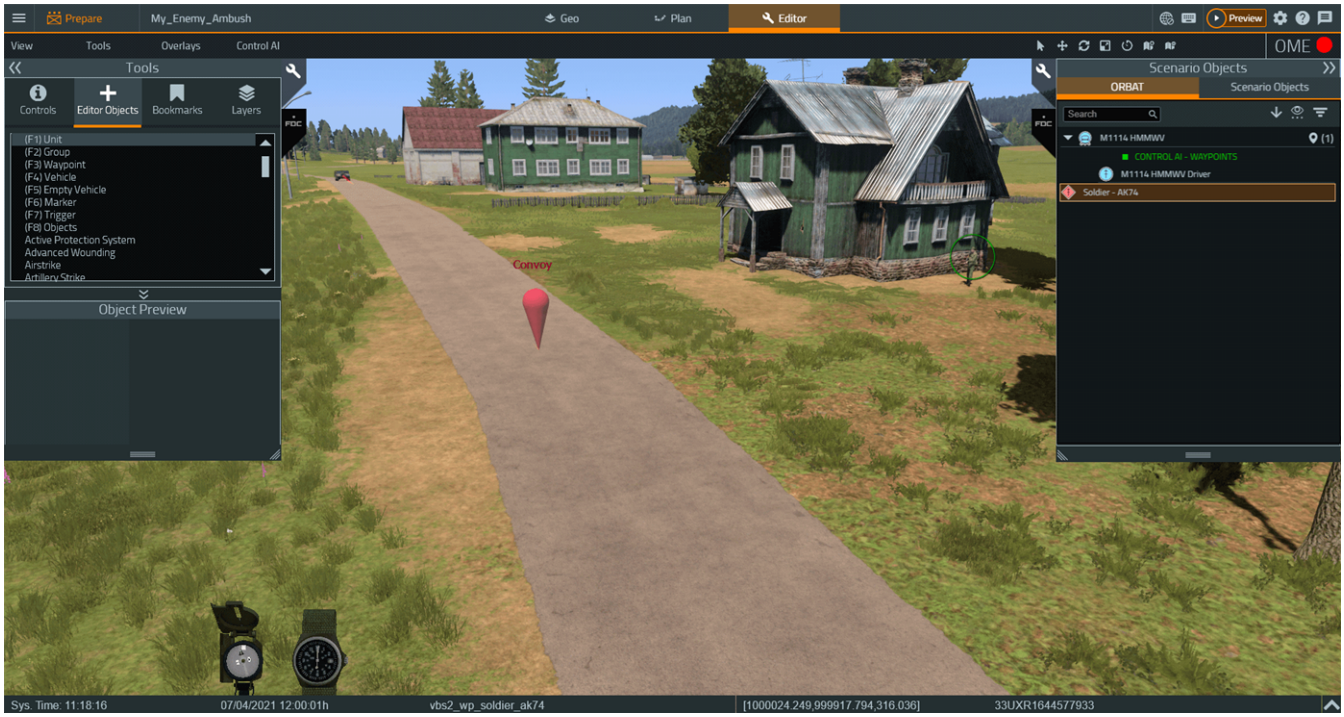
23. In the Object Properties dialog, select the **Generic OPFOR Woodland > Soldier - AK74** unit.

24. Select **Control AI** as the AI type, and click **OK**.

    The OPFOR unit is placed.

25. Hold **LShift + RMB** and move the mouse left / right to rotate the unit, so that it faces the road.

    The unit is positioned as indicated in the following image:

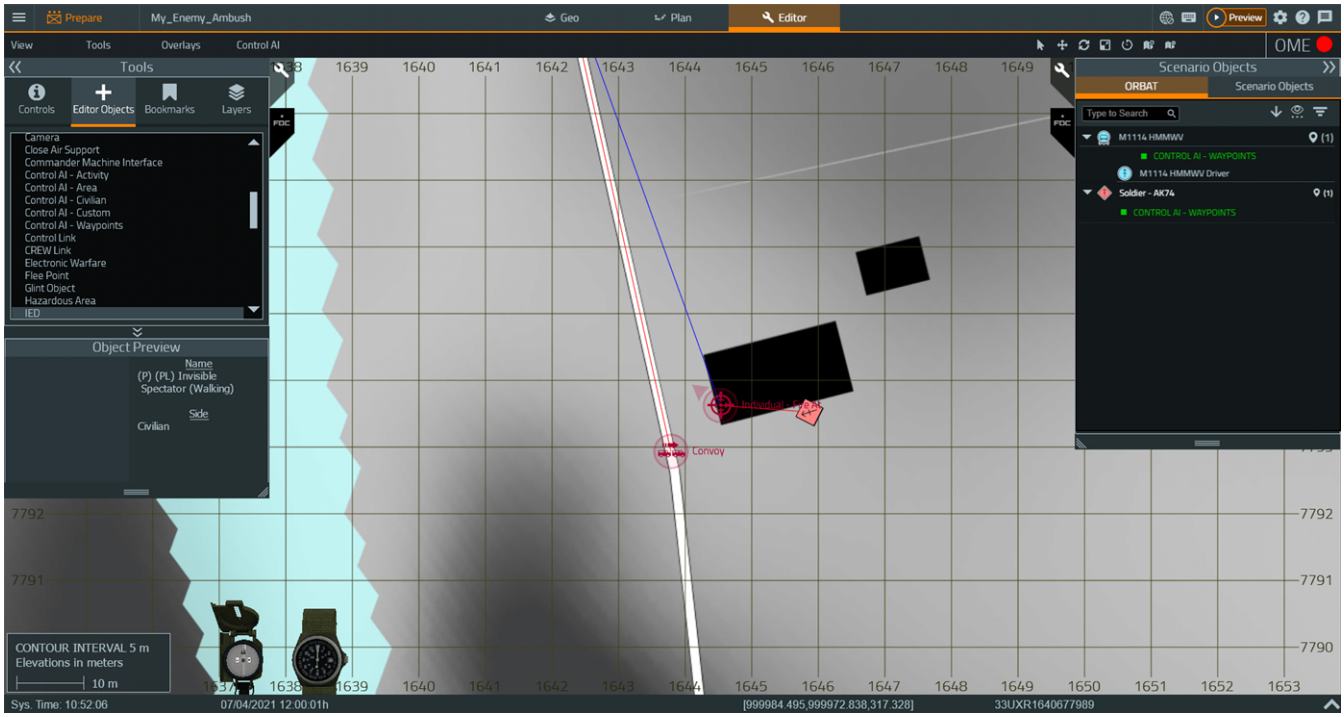



26. Press **Map** (**M**) to switch to the 2D View.
27. Hold **LShift**, click the unit, and click a location next to the road and opposite the southernmost house.

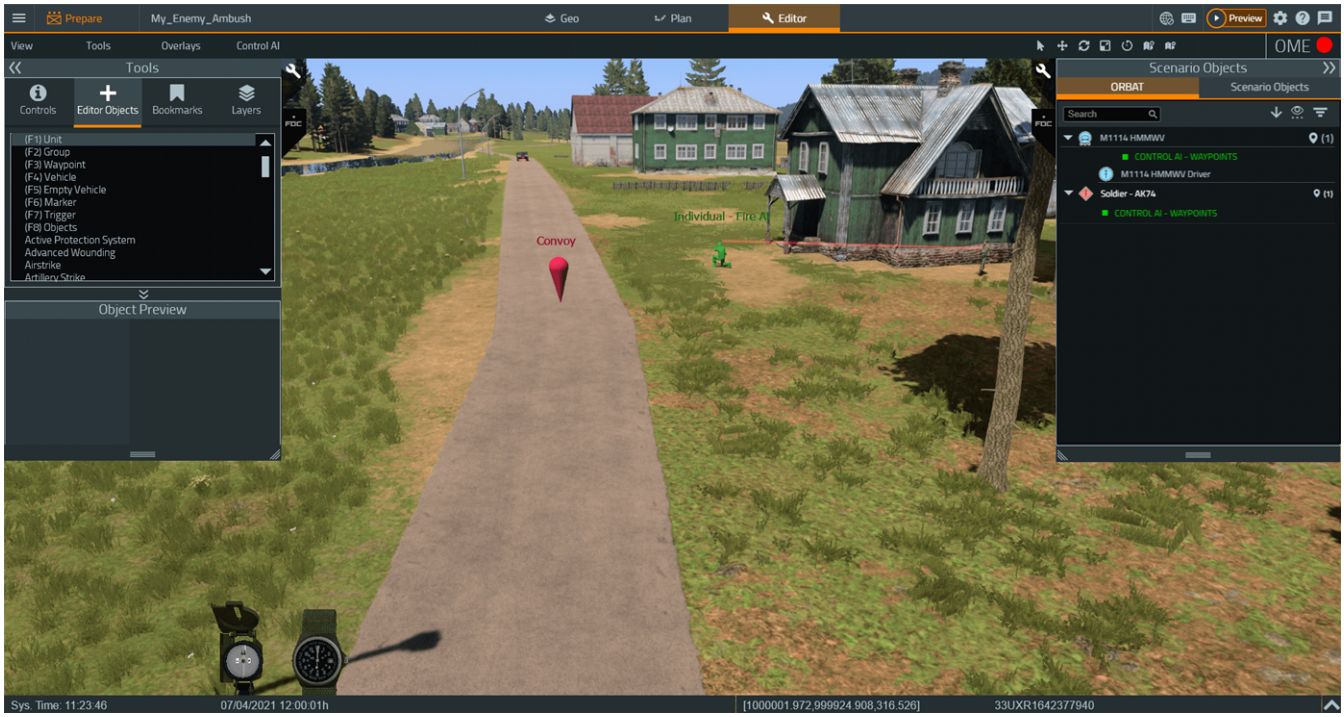
    The Control AI - Waypoints Object Properties dialog opens.
28. In the Object Properties dialog, in the **Behavior** list, select **Individual - Fire At**.
29. Set the following properties:
    - **Speed:** Run
    - **Stance:** Crouched
    - **Weapon stance:** Raised
    - **Weapon:** Primary
    - **Firing mode:** Burst
    - **On enemy spotted:** Open Fire
    - **On direct fire:** Open Fire
    - **Target (SQF code):** `blufor_target`

30. Click **OK**.

    The AI on Rails Individual - Fire At Order is placed.



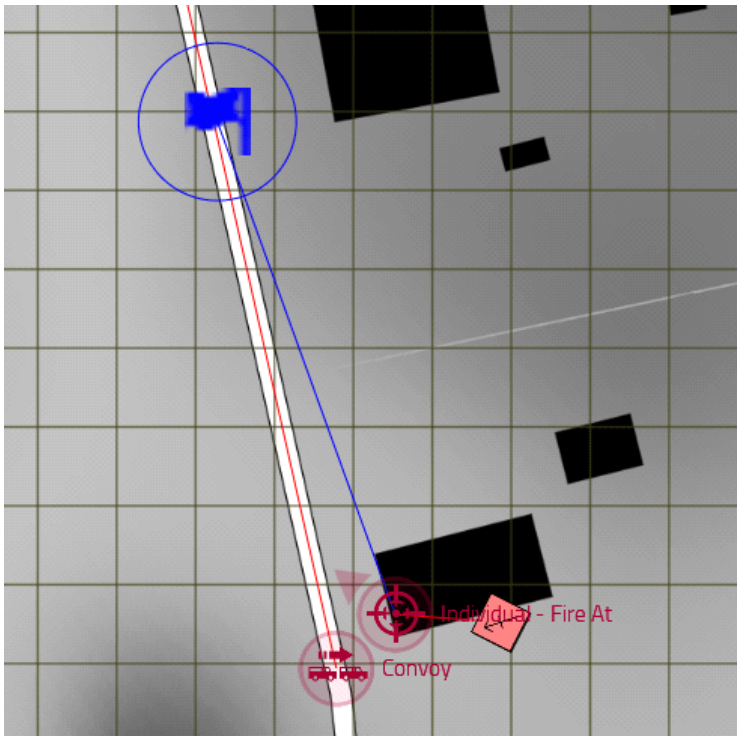

    In the 3D View, the Individual - Fire At Order visual proxy is displayed in green.



31. Hold **LShift + RMB** and move the mouse left / right to rotate the Individual - Fire At Order, so that it faces the road in the following way:


32. Double-click the BLUFOR vehicle, set **Name** to `blufor_target`, and click **OK**.
33. In 2D View, Hold **LShift**, click the Individual - Fire At Order, and click the Trigger.

    The Trigger is linked to the Individual - Fire At Order.



34. In the Tools Panel, select **(F1) Unit** and place a **VBS Objects > Invisible spectator (walking)** Player unit, anywhere on the map, where the Scenario takes place.
35. Expand the **Main Menu**, and under **Battlespaces**, select **Save**.

    The Scenario is saved.
36. Click **Preview** to preview the Scenario.
37. Press **Pause** (**Esc**) and in the VBS4 Toolbar, select **Editor** and press **Map** (**M**), to switch to the 3D View.

Observe how, once the BLUFOR vehicle enters the Trigger area, the OPFOR unit runs crouched and / or crouches to attack the BLUFOR vehicle.

This example Scenario is expanded in Command-Detonated IED Ambush Example (on page 189), where an IED detonates first, followed by an OPFOR unit ambush.

**NOTE**

The Enemy Ambush Scenario is also available as a sample Battlespace on VBS World Server or in:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

Compare your version of the scenario to the sample by deploying the sample Battlespace to VBS4.

**Follow these steps:**

- For Online use cases, do the steps in Copy Battlespace (below) on the VBS World Server computer, and then synchronize the Battlespace on the VBS4 Client connected to VBS World Server.
- For Offline use cases, copy the Battlespace from the `\optional\` folder.

  **Copy Battlespace**

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`
  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (on page 83) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (on page 80) using **UseCase** as the filter.

Select the sample Battlespace and select **Prepare > Editor > Open** to review the Scenario using VBS Editor.

## 11.2.2 Enemy Ambush Preparation

As an administrator, use VBS Editor in Prepare mode to create an Enemy Ambush Scenario.

**Follow these steps:**

1. Use VBS Editor to create a new Scenario, or edit an existing one.
2. VBS4 has units with specific functionality for Enemy Ambush, including the following:

| Unit | Description |
|---|---|
| OPFOR Unit | Any OPFOR unit that can be used to simulate Enemy Ambush.<br>**NOTE**<br>If you want to control the ambush units at the start of the scenario, they have to be set to **Player** or **Playable**. If you want to use AI on Rails (see the VBS Control AI Behavior Pack Manual), set the unit to **Control AI**. |

   Add personnel to the scenario.

   For more information on placing units, see Adding Units in the VBS4 Editor Manual.
3. VBS4 has vehicles with specific functionality for Enemy Ambush, including the following:

| Vehicle | Description |
|---|---|
| OPFOR Vehicle | Any OPFOR vehicle that can be used to simulate Enemy Ambush.<br>**NOTE**<br>If you want to control the ambush vehicles at the start of the scenario, they have to be set to **Player** or **Playable**. |

   Add vehicles to the scenario.

   For more information on placing vehicles, see Adding Vehicles in the VBS4 Editor Manual.
4. You can set the accuracy of your Enemy Ambush units, and control additional enemy engagement rules by using the AI Rules of Engagement in the VBS4 Editor Manual.
5. Add Waypoints and Triggers to Enemy Ambush personnel and vehicles.

   You can add Waypoints for the enemy forces to attack. The Waypoint execution uses Triggers.

   For more information, see Assigning Behavior Using Waypoints (if using VBS AI), Control AI Waypoints (if using Control AI), and Triggers in the VBS4 Editor Manual.

6. You can use Unit Path Recording (UPR) to make ambushes from buildings or from a certain position, and to make ambush units perform particular actions, to initiate an ambush. For more information, see UPR Enemy Ambush (on page 187).
7. If your OPFOR units are set to Control AI, you can use AI on Rails to perform the Enemy Ambush. For more information, see AI on Rails Enemy Ambush Example (on page 173).
8. Besides direct fire, you can also use indirect fire functionality in an Enemy Ambush.

   VBS4 has specific functionality for indirect fire, including the following:

| Indirect Fire Functionality | Description |
|---|---|
| VBS Call For Fire | VBS Call For Fire provides a simulated Fire Direction Center (FDC) to setup and enable rapid fire support.<br>For more information, see VBS Call for Fire Overview (on page 107). |
| Artillery Strike | The Artillery Strike Editor Object allows real-time artillery support.<br>For more information, see Artillery Strike in the VBS4 Editor Manual. |
| Fire Support | Some AI-controlled vehicles can provide fire support.<br>For more information, see Fire Support in the VBS4 Instructor Manual. |

9. Add additional BLUFOR units and / or vehicles.
10. Preview and save the mission.

    For more information, see Scenario Preparation (on page 85).

### 11.2.3 Enemy Ambush Execution

As an administrator, use VBS Editor in Execute mode to run an Enemy Ambush Scenario.

Start the Scenario and open VBS Editor.

For more information, see Scenario Execution (on page 89).

Use the Editor UI to modify the scenario as it runs.

A typical Enemy Ambush scenario has the following phases:

1. BLUFOR units and / or vehicles pass through Trigger area (see Triggers in the VBS4 Editor Manual) area.
2. The Trigger activates on BLUFOR presence, and OPFOR ambush units attack.
3. Wounded units can request medical assistance from medics.

## 11.2.4 Enemy Ambush with Triggers and Waypoints

A basic Enemy Ambush involves a Trigger and Waypoints (see Assigning Behavior Using Waypoints in the VBS4 Editor Manual).

**Follow these steps:**

1. Create a Trigger with the following properties:
   - **Activation:** BLUFOR
   - **Activation Type:** Present

   The Trigger is activated, when a BLUFOR unit or vehicle enters the Trigger area.
2. Create a Move Waypoint (see Appendix 1 - Waypoint Types in the VBS4 Editor Manual), where the ambush group waits before the ambush begins. Set the following Waypoint properties:
   - **Combat:** Never Fire / Hold Fire
   - **Behavior:** Stealth / Careless
   - **Formation:** Column (Compact) / Any
3. Create a Move Waypoint, where the ambush group moves to start the ambush. Set the following Waypoint properties:
   - **Combat:** Open Fire / Open Fire, Engage at Will
   - **Behavior:** Aware / Combat
4. Right-click the Waypoint, where the ambush group waits before the ambush, select **Sync to Trigger** and click the Trigger.

   In the scenario Execution phase, the ambush group waits at the first Waypoint, until the Trigger is activated. The Trigger causes the group to move to the next Waypoint and start the ambush.
5. Start the scenario.
6. You can add waypoints during the Execution phase in VBS Editor.
7. In VBS Editor, right-click the unit and select **Switch to Unit** (see Interacting with Editor Objects in the VBS4 Editor Manual), to take control of the AI unit.

## 11.2.5 UPR Enemy Ambush

You can use Unit Path Recording (UPR) to make ambushes from buildings or from a certain position, and to make ambush units perform particular actions, to initiate an ambush.

**Follow these steps:**

1. Create a Trigger with the following properties:
   - **Activation:** BLUFOR
   - **Activation Type:** Present
   - **On Activation:** `ambush_start = true;`

   The Trigger is activated, when a BLUFOR unit or vehicle enters the Trigger area.
2. Set an OPFOR ambush unit to be the player.
3. Preview the scenario.
4. Open the VBS Editor, select **Tools > Enable Record Path Hot Key**, and close the VBS Editor.
5. Press **Player Path Recording** (**P**) to enable path recording.
6. As a player, perform the OPFOR unit ambush actions, such as moving to a position and firing different weapons.
7. Press **Player Path Recording** (**P**) again, enter a name for the recording, and save it.
8. Press **Esc**, open the VBS4 Main Menu (on page 36), then select **Exit Battlespace** to exit the Battlespace and return to Prepare mode.
9. Create a UPR Editor Object (EO).
10. Select the recording that you saved.

    **WARNING**

    To enable the recording in multiplayer, make sure to check **Mission Folder**, to save the recording in the Battlespace folder.

11. Set **Replay Condition** to: `!isNil {ambush_start}`

    **WARNING**

    The recommended condition pattern is `!isNil {global_variable}`. The condition must always return a true or false result (not an undefined result) throughout the scenario. Otherwise, the UPR fails to activate.

12. Link the UPR EO to the OPFOR unit.
13. Set the player as another unit.
14. Save the scenario.

15. Preview the scenario.
16. Activate the BLUFOR Trigger you created in the Preparation phase, and observe the results of the ambush.

# 11.3 Improvised Explosive Device Ambush

This use case simulates an IED Ambush, when IEDs / mines explode and enemy forces ambush the detonation location.

The IED Ambush use case is related to the Route Clearance (on page 199) use case.

For a walkthrough example of a simple IED Ambush scenario, see:

- Command-Detonated IED Ambush Example (below)

The general workflow of an IED Ambush simulation in VBS4 contains two parts:

- IED Ambush Preparation (on page 194)
- IED Ambush Execution (on page 196)

For IED Ambush examples that have Preparation and Execution phases, see the following:

- Victim-Initiated IED Ambush (on page 197)
- Suicide Bomber IED Ambush (on page 198)

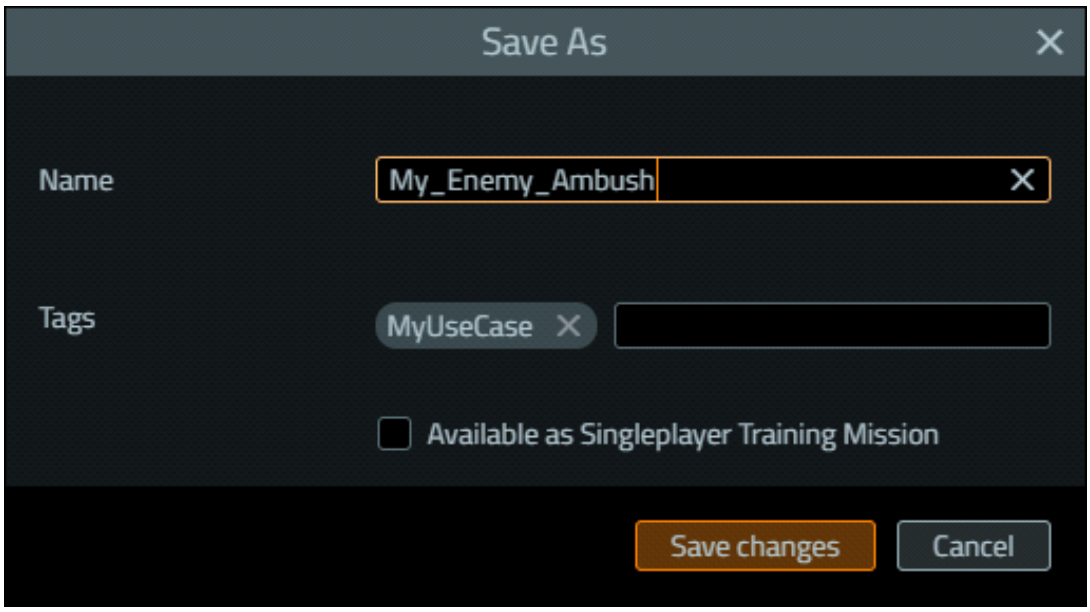
## 11.3.1 Command-Detonated IED Ambush Example

A command-detonated IED Ambush expands the AI on Rails Enemy Ambush Example (on page 173) Scenario, by adding an IED, which is detonated prior to an enemy ambush.

**Follow these steps:**

1. Follow the steps 1 - 35 in the AI on Rails Enemy Ambush Example (on page 173) Scenario.
2. Expand the **Main Menu**, and under **Battlespaces**, select **Save As**.

   The Save As dialog opens.

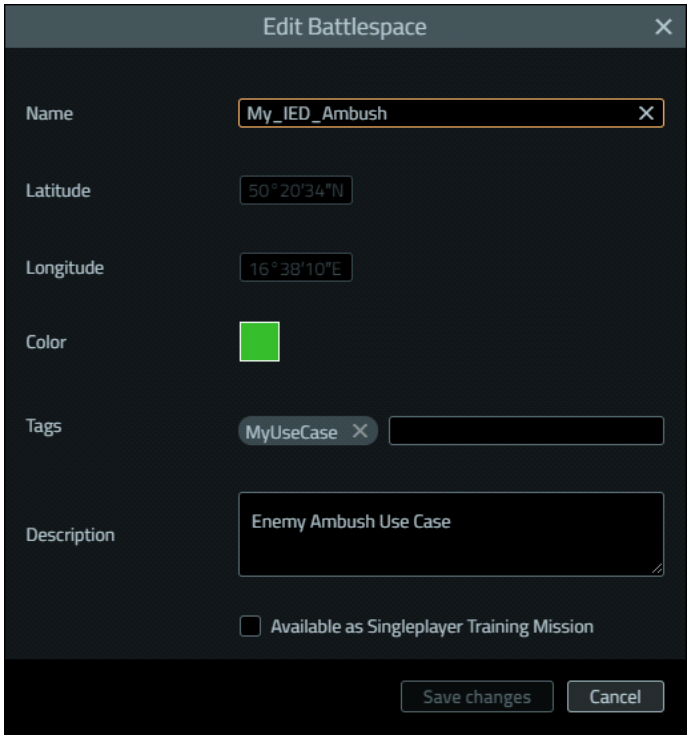


3. In **Name**, type **My_IED_Ambush**
4. Click **Save Changes**.
5. Expand the **Main Menu**, and select **Close Prepare** and click **Save and Close**.

   VBS4 returns to Battlespaces Mode.
6. In the **Battlespaces** tab, Select the **My_IED_Ambush** Battlespace, and click the **Edit** icon.

   The Edit Battlespace dialog opens.

   
   
7. Input the following details in the Edit Battlespace dialog:

| Parameter | Value |
|---|---|
| **Description** | IED Ambush Use Case |

8. Click **Save Changes**.

9. Select the **My_IED_Ambush** Battlespace, and under **Prepare > Editor**, click **Open**.

   The Battlespace opens in the VBS Editor (Prepare Mode) in the 2D View.


> **TIP**
>
> If required, toggle terrain textures in the 2D View, select **View > Hide / Show Texture**.

Use the Classic Camera Controls to move the camera:

10. Drag the BLUFOR vehicle, and place it north up the road.

    This gives the vehicle more time to reach the Trigger.

11. In the Tools Panel, select **IED**, and click a location, left of the road, next to the Trigger.

    The IED Object Properties dialog opens.

12. In the Object Properties dialog, set the following properties:

    - **Type:** Soda Can 2
    - **Explosion Size:** Small
    - **Explosion Type:** Wound Only
    - **Trigger Type:** Admin and Bomb Carrier

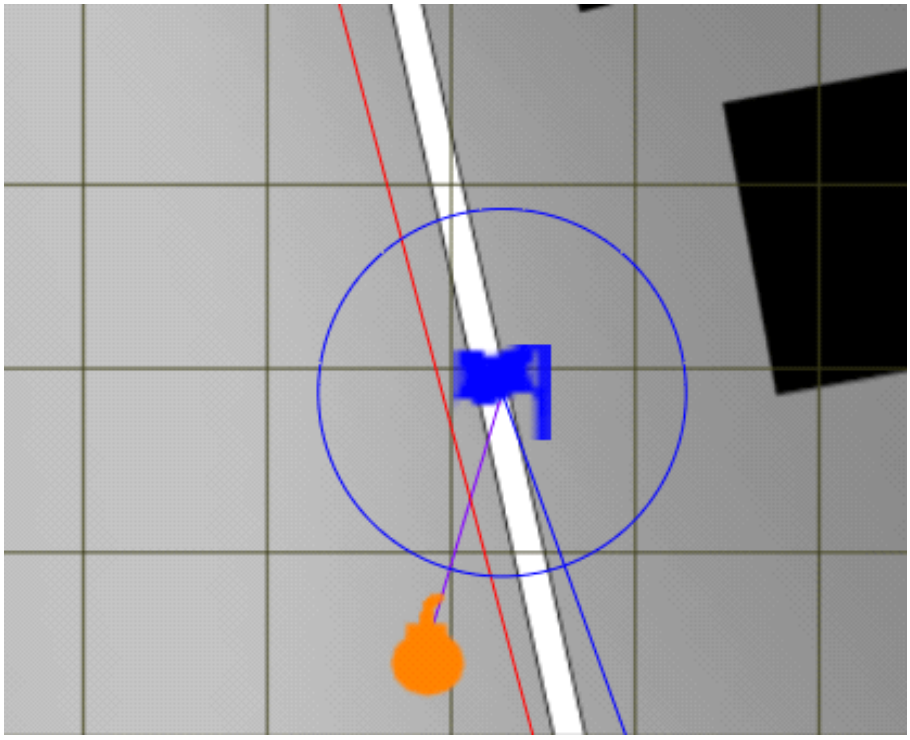
13. Click **OK**.

    The IED is placed.

14. Hold **LShift**, click the IED, and click the Trigger.

    The Trigger is linked to the IED, which makes the IED detonate when the BLUFOR vehicle enters the Trigger area. Since the IED **Trigger Type** setting is set to **Admin and Bomb Carrier**, you can also detonate the IED as the Scenario Administrator before the vehicle enters the Trigger area (see step 17).



15. Click **Preview** to preview the Scenario.
16. Press **Pause** (**Esc**) and in the VBS4 Toolbar, select **Editor** and press **Map** (**M**), to switch to the 3D View.
17. As an Administrator, you can detonate the IED before the BLUFOR vehicle enters the Trigger area, by right-clicking **Soda Can 2** in the Scenario Objects Panel and selecting **Explode IEDs**.

Observe how the IED detonates either by the Administrator or by the BLUFOR vehicle entering the Trigger area, after which, the OPFOR unit crouches to attack the BLUFOR vehicle.

**NOTE**

The IED Ambush Scenario is available as a sample Battlespace on VBS World Server or in:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

Compare your version of the scenario to the sample by deploying the sample Battlespace to VBS4.

**Follow these steps:**

- For Online use cases, do the steps in Copy Battlespace (below) on the VBS World Server computer, and then synchronize the Battlespace on the VBS4 Client connected to VBS World Server.
- For Offline use cases, copy the Battlespace from the `\optional\` folder.

  **Copy Battlespace**

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (on page 83) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (on page 80) using **UseCase** as the filter.

Select the sample Battlespace and select **Prepare > Editor > Open** to review the Scenario using VBS Editor.

## 11.3.2 IED Ambush Preparation

As an administrator, use VBS Editor in Prepare mode to prepare an IED Ambush mission.

**Follow these steps:**

1. Use VBS Editor to create a new Scenario, or edit an existing one.
2. Add any of the following standalone hazards to the IED Ambush scenario:

| Hazard | Description |
|---|---|
| Mines | Place mines in your scenario. For more information, see Placing Mines in the VBS4 Editor Manual. |
| IEDs | Place IEDs in the scenario. For more information, see Placing IEDs in the VBS4 Editor Manual. |

3. VBS4 has units with specific functionality for IED Ambush, including the following:

| Unit | Description |
|---|---|
| Suicide Bomber | Any OPFOR unit with "Suicide Bomber" in its name. For example:<br>• **AF Civilians > Female Suicide Bomber - Light Blue**<br>• **IQ Civilians > Suicide Bomber 1 - Suicide Bomber 6**<br>OPFOR units, such as the Taliban, have explosive belts. For example:<br>• Any unit in the **AF Taliban** category. |
| Triggerman | Any unit that activates the IED. |
| Observer | Any unit that watches for targets, and signals the triggerman and / or the ambush unit.<br>You can equip the observer with binoculars. For more information, see Edit Equipment Loadout in the VBS4 Editor Manual. |
| Ambush Unit | Any OPFOR unit. |

For more information on how suicide bombers and / or triggermen can be attached to activate an IED, see Attaching IEDs to Units and Vehicles in the VBS4 Editor Manual.

Add personnel to the scenario.

For more information on placing units, see Adding Units in the VBS4 Editor Manual.

4. VBS4 includes specific functionality for vehicles for IED Ambush, including the following:

| Vehicle | Description |
|---|---|
| Any Vehicle | Attach an IED to any vehicle to create a VBIED.<br>For more information, see Attaching IEDs to Units and Vehicles in the VBS4 Editor Manual. |

Add vehicles to the scenario.

For more information on placing vehicles, see Adding Vehicles in the VBS4 Editor Manual.

5. Add additional objects and equipment.

   VBS4 includes a specific set of Editor Objects and equipment for IED Ambush scenarios:

| Additional Object / Equipment | Description |
|---|---|
| IED Indicators | You can use visual indicators, to designate IEDs:<br>• **Objects > Objects - IED**<br>You can also use decoys and clutter objects, to hide IEDs:<br>• **Objects > Objects - Outdoor**<br>• **Objects > Scenery - Misc** |

   For more information, see the respective topics in the VBS4 Editor Manual.

6. Add Waypoints and Triggers to IED Ambush personnel and vehicles.

   You can add Waypoints for the enemy forces to attack (both for personnel, such as the ambush units, and vehicles, such as the VBIED vehicles). The Waypoint execution uses Triggers.

   For more information, see Assigning Behavior Using Waypoints (if using VBS AI), Control AI Waypoints (if using Control AI), and Triggers in the VBS4 Editor Manual.

7. Add additional BLUFOR units and / or vehicles.

8. Preview and save the mission.

   For more information, see Scenario Preparation (on page 85).

### 11.3.3 IED Ambush Execution

Once the IED Ambush scenario is prepared by the administrator, it can be executed.

Start the Scenario and open VBS Editor.

For more information, see Scenario Execution (on page 89).

Use the Editor UI to modify the scenario as it runs.

A typical IED Ambush scenario has the following phases:

1. BLUFOR units and / or vehicles pass through an area.
2. An enemy observer spots the BLUFOR units / vehicles, signals to the triggerman, and the latter detonates the IED.

   The spotting is usually done with binoculars. For more information, see the use of binoculars in Standard Equipment (infantry units) and Personal Equipment Controls (vehicle crew) in the VBS4 Trainee Manual.

   The following detonation types are available:

| IED Detonation Type | Description |
|---|---|
| Administrator Triggered | As an administrator, you can detonate IEDs manually. For more information, see Detonating an IED in the VBS4 Editor Manual. |
| Role-Play Detonation | The player, in the role of a triggerman, detonates the IED. For more information, see Trigger Type in the VBS4 Editor Manual. |
| Automatic Trigger | Automatic triggering (for example, by proximity, using a timer, or driving over a mine). For more information, see Trigger Type and Attaching IEDs to Triggers in the VBS4 Editor Manual. |

3. OPFOR units ambush the BLUFOR units / vehicles at the detonation site.

   An IED Ambush uses either an enemy group on foot or in vehicle (VBIED).

   For more information on how to simulate enemy ambush, see the Enemy Ambush (on page 173) use case.
4. Wounded units can request medical assistance from medics.

### 11.3.4 Victim-Initiated IED Ambush

A victim-initiated IED Ambush occurs when BLUFOR units and / or vehicles step on / drive over, or come within a detonation-proximity range of the mine / IED.

**For AI and player-controlled units / vehicles, follow these steps:**

1. Place an IED.
2. Set **Trigger Type** (see Trigger Type in the VBS4 Editor Manual) to one of the following:
   - **Proximity** - Set **Prox. Side** to BLUFOR or Any.
   - **Pressure Plate**

## 11.3.5 Suicide Bomber IED Ambush

A suicide bomber IED Ambush involves a suicide bomber on foot or a VBIED vehicle:

> **NOTE**
> This example only has a player-controlled part.

**For a player-controlled suicide bomber and VBIED vehicle, follow these steps:**

1. Place an IED.
2. Set **Trigger Type** to one of the following:
   - **Admin and Bomb Carrier** for role-play **Detonate IED** User Action.
   - **Proximity** with **Prox. Side** set to BLUFOR.

     > **NOTE**
     > The **Detonate IED** User Action is also available.

   - **Admin Only**, which can be detonated from VBS Editor by right-clicking the IED in the Scenario Objects Panel, and selecting **Detonate IED**.
3. Select one of the following suicide bomber unit types:
   - Suicide bomber on foot:
     a. Right-click the IED, select **Attach to Unit**, and click the suicide bomber unit.
   - VBIED:
     a. Right-click the IED, select **Attach to Vehicle**, and click the VBIED vehicle.
     b. Position the IED object within the vehicle, or right-click the IED and select **Hide IED**, to make it invisible.
4. In the OME, set the unit as **Player** or **Playable**. In VBS Editor, right-click the unit and select **Switch to Unit** to take control of the AI unit.
5. To detonate the IED, select one of the following.
   - A role-play unit on foot selects the **Detonate IED** User Action.
   - A role-play VBIED vehicle driver selects the **Detonate VBIEDs** User Action.

# 11.4 Route Clearance

The purpose of Route Clearance is to secure an important route and render it safe for transport. VBS4 supports Route Clearance for land mines and IEDs.

For a walkthrough example of a simple Route Clearance scenario, see:

- Husky T-MDV Route Clearance Example (below)

A typical Route Clearance group consists of the following:

- A sapper platoon.
- An EOD (Explosive Ordnance Disposal) team.
- At least one medic.
- A wrecker vehicle team.

The general workflow of a Route Clearance simulation in VBS4 contains two parts:

- Route Clearance Preparation (on page 211)
- Route Clearance Execution (on page 214)

## 11.4.1 Husky T-MDV Route Clearance Example

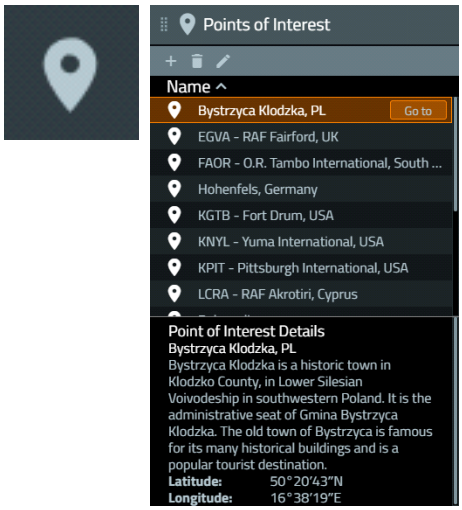
You can create a Route Clearance Scenario, using a Husky T-MDV vehicle. The Route Clearance Scenario clears hazards along the same route used in the Control AI Convoy Example (on page 161) Scenario.

**Follow these steps:**

1. In the VBS4 Toolbar of the Battlespaces Mode, select the **Battlespaces** tab.

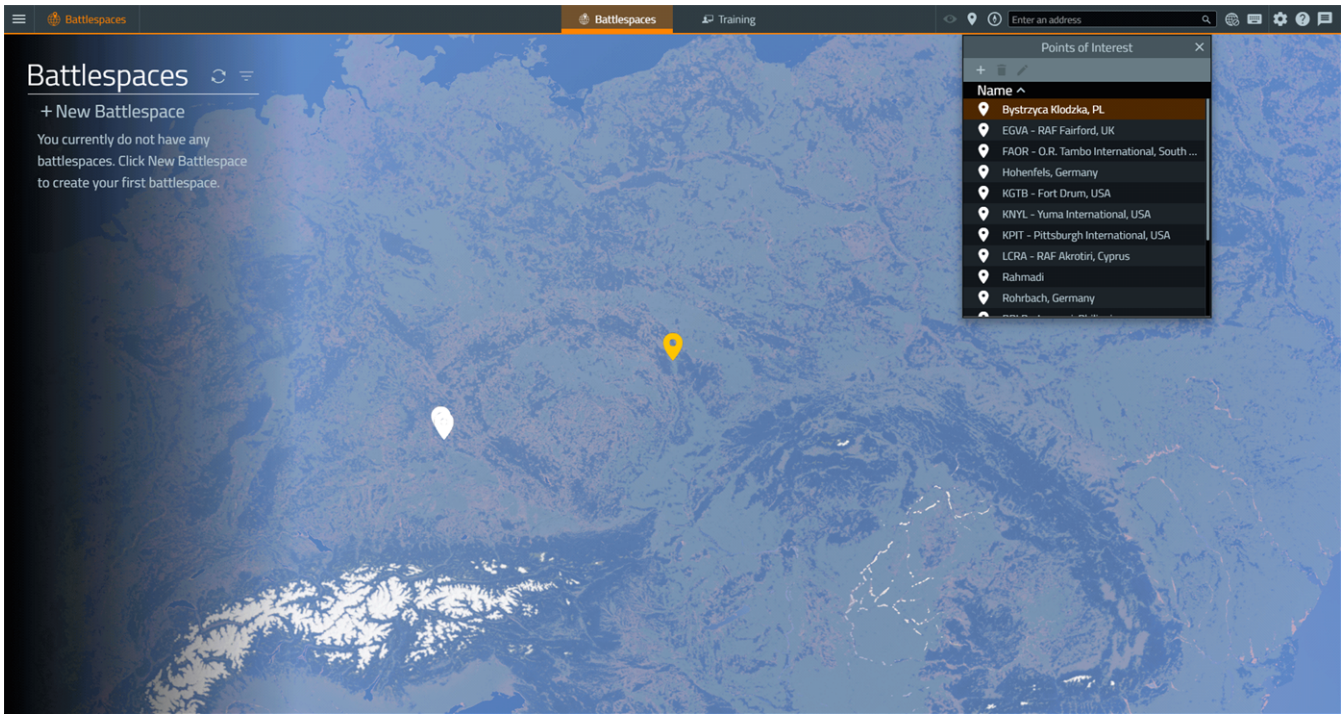
   **NOTE**
   When starting the VBS4 Admin Client, the Battlespaces tab is selected by default.

2. Click the **POI Icon** to open the POI Panel.




3. In the Points of Interest Panel, select **Bystrzyca Klodzka, PL**, and click **Go to**.

   The Whole-Earth Terrain rotates directly above the Bystrzyca Klodzka terrain, in Poland.



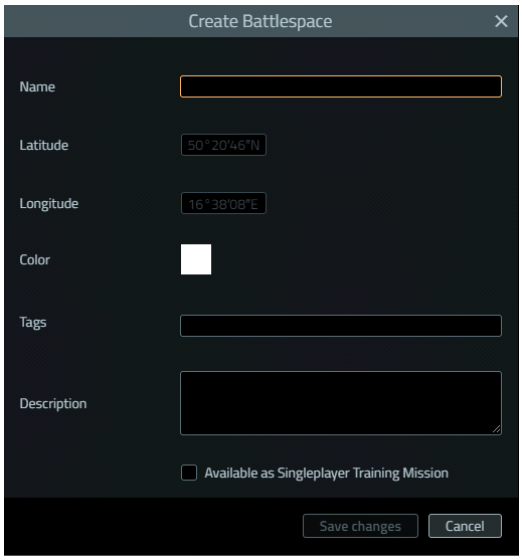

 

4. In the Search Bar of the VBS4 Toolbar, input the coordinates **50°20'46"N, 16°38'08"E**, and then press **Enter**.

   Use the **Mouse Scroll Wheel** to zoom in to view the area displayed in the following image:

5. Click **+ New Battlespace** and click the location of the **yellow** circle.

   The Create Battlespace Dialog opens, displaying the selected coordinates.



6. Input the following details in the Create Battlespace dialog:

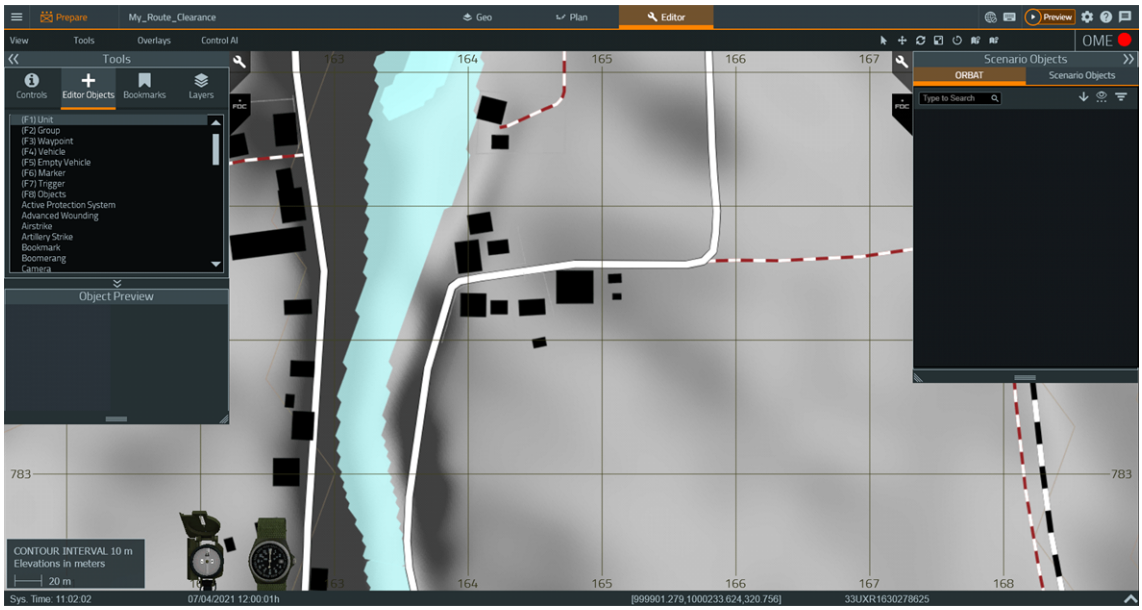
| Parameter | Value |
|---|---|
| **Name** | My_Route_Clearance |
| **Color** | **Green** #36b82c |
| **Tags** | MyUseCase |
| **Description** | Route Clearance Use Case |

7. Click **Save Changes**.

   VBS4 adds the Battlespace to the Battlespaces List, and a **green** icon to the Whole-Earth Terrain.

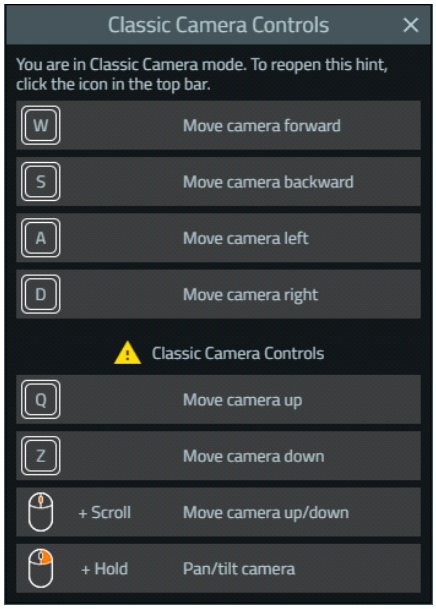
8. Select the newly created **My_Route_Clearance** Battlespace, and under **Prepare > Editor**, click **Create**.

   The Battlespace opens in the VBS Editor (Prepare Mode) in the 2D View.




> **TIP**
>
> If required, toggle terrain textures in the 2D View, select **View > Hide / Show Texture**.

Use the Classic Camera Controls to move the camera:




9. In the Tools Panel, select **(F4) Vehicle**, and click a location on the white road where you want the Husky T-MDV vehicle placed.

10. In the Object Properties dialog, select the **US Army Wheeled - Woodland > Husky - T-MDV, IA** vehicle, and click **OK**.

    **WARNING**

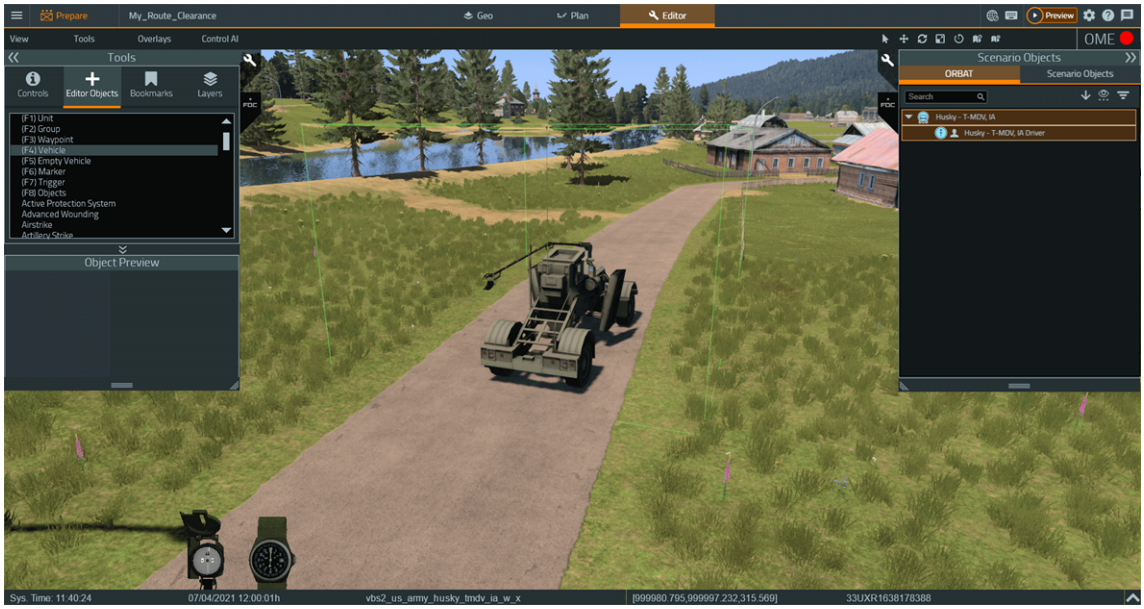
    Make sure the **Player** is selected in **Has Crew? / Special**, so that the vehicle is playable:

    The Husky T-MDV vehicle is placed.

11. Hold **LShift + RMB** and move the mouse left / right to rotate the vehicle, so that it aligns with the road, facing north. Press **Map** (**M**) to switch between 2D / 3D View.

    The vehicle is positioned as indicated in the following image:

12. In the Tools Panel, select **IED**, and click a location on the map next to the road where it turns right.

    The IED Object Properties dialog opens.

13. In the Object Properties dialog, set the following properties:

    - **Type:** Bag 01
    - **Explosion Size:** Small
    - **Explosion Type:** Deadly
    - **Trigger Type:** Admin and Bomb Carrier

14. Click **OK** to place the IED.

15. Place another IED, east of the first IED, next to the road, and set the following properties:
    - **Type:** Bag 02
    - **Explosion Size:** Small
    - **Explosion Type:** Fake (No Damage)
    - **Trigger Type:** Admin and Bomb Carrier
16. Click **OK** to place the IED.
17. In the Tools Panel, select **Mine**, and click a location on the road, where it turns north.

    The Mine Object Properties dialog opens.
18. In the Object Properties dialog, set the following properties:
    - **Type:** AT2 Anti-Tank Mine (Hidden)
19. Click **OK** to place the mine.

20. Click **Preview** to preview the Scenario.

    The Scenario starts with you in position of the Husky T-MDV driver and operator.

21. Press **Quick Menu** (**Left Windows**) (see Quick Menu Actions in the VBS4 Trainee Manual), and select **VEHICLE > ACTIVATE MINE DETECTOR**.

    The Husky T-MDV mine detector is activated, and the detector flaps are lowered on each side of the vehicle.

22. Press **Quick Menu** (**Left Windows**), and select **OPERATE IA**.

    The Interrogator Arm (IA) operation menu opens at the bottom of the screen.

23. Drive to the first IED, using the following vehicle controls:

    The following table lists the Land Vehicle Controls, defaults, and option names from the **Vehicle controls** and **Infantry controls** category filters in the Controls Settings in the VBS4 Administrator Manual:

    > **NOTE**
    > For Microsoft Xbox land vehicle controls, see Microsoft Xbox Controls.

| Default Control | Description | Control Option Name |
|---|---|---|
| **W** | Forward | Car Forward |
| | **NOTE** **W** does not reach the maximum speed. Use **Car Fast Forward**. | |
| **S** | Brake / Reverse | Car Back |
| **A / Mouse Left** | Turn Left | Car Left / Car More Left |
| **D / Mouse Right** | Turn Right | Car Right / Car More Right |
| **Q** | Slow Forward | Car Slow Forward |
| **E / LShift + W** | Fast Forward | Car Fast Forward / Vehicle Turbo + Car Forward |
| **LMB** | Horn | Fire |

24. Operate the IA to pick up the first IED, using the following IA controls:

| IA Action | Control | IA Action | Control |
|---|---|---|---|
| Rotate arm left | User Defined 1 | Secondary boom up | User Defined 7 |
| Rotate arm right | User Defined 2 | Secondary boom down | User Defined 8 |
| Main boom up | User Defined 3 | Claw open | User Defined 9 |
| Main boom down | User Defined 4 | Claw close | User Defined 10 |
| Extend boom | User Defined 5 | Stow IA | User Defined 11 |
| Retract boom | User Defined 6 | Drop objects | User Defined 12 |
| | | Disarm IEDs | User Defined 13 |

25. Use the IA camera to assist you in operating the IA.

    The IA variant of the Husky T-MDV has three ways of viewing the IA camera:

    - On-screen in the upper-right corner.
    - On the screen in the Husky cabin.
    - Full-screen.

**Image-13: IED on screen, ready to be picked up**


**Image-14: Picked-up IED, ready to disarm**


The IA picks up the IED automatically, once IA claw is adjusted and is close enough to the IED.

26. Press **Quick Menu** (**Left Windows**), and select **VEHICLE > DISARM IEDS**.

    The message **Bomb disarmed** appears on screen.

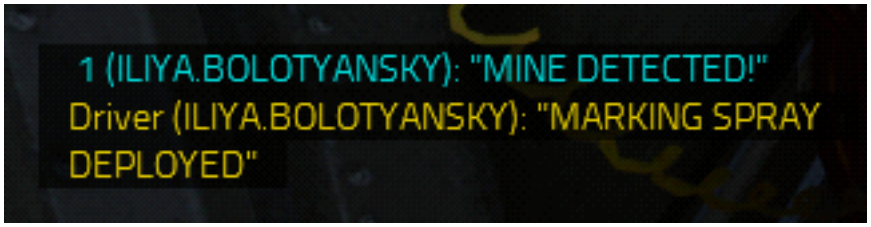

27. Press **Quick Menu** (**Left Windows**), and select **VEHICLE > DROP OBJECTS**.

    The IA releases the disarmed IED.

28. Repeat steps 21 - 24 for the second IED.

> **TIP**
>
> When you finished, stow the IA by selecting **VEHICLE > STOW IA** in the Quick Menu.

29. Drive up the road over the hidden mine, until you see the following messages: **MINE DETECTED** and **MARKING SPRAY DEPLOYED** at the bottom of the screen.




    The Husky T-MDV automatically marks the detected mine location with spray.

**NOTE**

The Route Clearance Scenario is also available as a sample Battlespace on VBS World Server or in:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

Compare your version of the scenario to the sample by deploying the sample Battlespace to VBS4.

**Follow these steps:**

- For Online use cases, do the steps in Copy Battlespace (below) on the VBS World Server computer, and then synchronize the Battlespace on the VBS4 Client connected to VBS World Server.
- For Offline use cases, copy the Battlespace from the `\optional\` folder.

  **Copy Battlespace**

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (on page 83) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (on page 80) using **UseCase** as the filter.

Select the sample Battlespace and select **Prepare > Editor > Open** to review the Scenario using VBS Editor.

## 11.4.2 Route Clearance Preparation

As an administrator, use VBS Editor in Prepare mode to prepare Route Clearance mission.

**Follow these steps:**

1. Use VBS Editor to create a new Scenario, or edit an existing one.
2. Add any of the following hazards to the Route Clearance scenario:

| Hazard | Description |
|---|---|
| Mines | Place mines in your scenario. For more information, see Placing Mines in the VBS4 Editor Manual. |
| IEDs | Place IEDs in the scenario. For more information, see Placing IEDs in the VBS4 Editor Manual.<br>In addition, you can use other visual indicators, to designate IEDs, such as the following:<br>• **Objects > Objects - IED**<br>• **Objects > Objects - Outdoor**<br>• **Objects > Scenery - Misc**<br>For information on using IEDs in an ambush, see the Improvised Explosive Device Ambush (on page 189) use case. |

3. VBS4 has units with specific functionality for Route Clearance, including the following:

| Unit | Description |
|---|---|
| EOD Bombsuit Technician | An EOD technician wears a special bombsuit and can disarm IEDs:<br>• **US USMC Desert / Woodland > EOD - Bombsuit Technician**<br><br>**NOTE**<br>Cannot disarm mines, but can be equipped with a Mine Marker Kit to detect and mark mines. For more information, see Mine Marker Kit in the VBS4 Trainee Manual. |
| Bomb Detection Dog | A specially trained bomb detection dog can be used to locate IEDs:<br>• **Animals > German Shepherd - Bomb Detection Dog (MWD)** (see Using Bomb Detection Dog in the VBS4 Trainee Manual)<br><br>**NOTE**<br>Cannot detect mines. |
| Medics | A set of medical personnel available to treat injuries incurred as a result of trying to defeat the hazards. Each medic model name is prefixed with **Medic**. |

Add personnel to the scenario.

For more information on placing units, see Adding Units in the VBS4 Editor Manual.

4. VBS4 has vehicles with specific functionality for Route Clearance, including the following:

| Vehicle | Description |
|---|---|
| IED and Mine Clearance | Engineering vehicles can be used for defeating hazards:<br>• **Buffalo** (only defeats IEDs)<br>• **Husky - T-MDV, IA** (only defeats IEDs)<br>• **Vehicles with mine rollers** (defeat both mines and IEDs):<br>◦ **AU Army Wheeled - Desert / Woodland > Bushmaster - Troop Carrier, Mag 58, SMR2**<br>◦ **US Army Wheeled - Woodland > M1132 Stryker ESV - M2 - Rollers**<br>◦ **US Army Wheeled - Woodland > M1132 Stryker ESV - Mk19 - Rollers**<br>• **MICLIC Vehicles** (defeat both mines and IEDs):<br>◦ **M1150 Assault Breacher Vehicle**<br>◦ **M60 - AVLM** |
| Unmanned Vehicles | UGVs, such as the Talon EOD, can be used to defeat hazards:<br>• **Unmanned Vehicles > Talon EOD** (defeats both mines and IEDs) |
| Towing Vehicles | Towing vehicles team.<br>For example, a wrecker-vehicle team tows damaged equipment and other vehicles:<br>• **MC3 - Wrecker** and **M1089 Wrecker**<br>Another example is towing with a winch, for which the following vehicle model is available:<br>• **M88A2 - ARV**<br>Other vehicles can tow by Enabling Automatic Towing in the mission. |

Add vehicles to the scenario.

For more information on placing vehicles, see Adding Vehicles in the VBS4 Editor Manual.

5. Add additional objects and equipment.

   VBS4 includes a specific set of Editor Objects and equipment for Route Clearance scenarios:

| Additional Object / Equipment | Description |
|---|---|
| CREW Link | Counter RCIED (Radio-Controlled Improvised Explosive Device) Electronic Warfare (CREW) can be used to jam IED signals, to disable detonation. For more information, see Enabling CREW in the VBS4 Editor Manual. |
| Mine Marker Kits | Place Mine Marker Kits (**Objects > Mine Marker Kit**) in your scenario to mark mines.<br>**NOTE**<br>Mine Marker Kits are usually used by specialized personnel, such as EOD bombsuit technicians, but any other type of unit can use them too.<br>For information on how to use the Mine Marker Kit, see Mine Marker Kit in the VBS4 Trainee Manual. |

6. Add additional BLUFOR units and vehicles that are protected by the Route Clearance group.

   For example, a Route Clearance group often accompanies a convoy. For more information on convoys, see the Convoys (on page 161) use case.

7. Preview and save the mission.

   For more information, see Scenario Preparation (on page 85).

## 11.4.3 Route Clearance Execution

Once the Route Clearance scenario is prepared by the administrator, it can be executed.

Start the Scenario and open VBS Editor.

For more information, see Scenario Execution (on page 89).

Use the Editor UI to modify the scenario as it runs.

A typical Route Clearance scenario has the following phases:

**Hazard Detection**

Players perform hazard detection along the route.

VBS4 supports the following hazard detection functionality:

| Detection Simulation | Description |
|---|---|
| Husky T-MDV | The Husky T-MDV vehicle has the following detection mechanisms:<br>• Metal Detector (MD)<br>• Ground Penetrating Radar (GPR) |
| Buffalo | The Buffalo vehicle has an arm camera to detect hazards.<br>For more information, see Using the Buffalo in the VBS4 Trainee Manual. |
| UGV | A UGV, such as the Talon EOD, can be deployed to investigate the scene.<br>For more information, see Using UGVs and Static Sensors in the VBS4 Trainee Manual. |
| Bomb Detection Dog | A Bomb Detection Dog (see Using Bomb Detection Dog in the VBS4 Trainee Manual) can be sent to spot hazards. |
| Binoculars | Infantry units and vehicle crew can use binoculars.<br>For more information, see the use of binoculars in Standard Equipment (infantry units) and Personal Equipment Controls (vehicle crew) in the VBS4 Trainee Manual. |

**Defeat Hazards**

If hazards are detected, an EOD team moves in to defeat the hazards.

> **NOTE**
>
> As an administrator, you can detonate IEDs manually. For more information, see Detonating an IED in the VBS4 Editor Manual.

VBS4 supports the following hazard-defeat functionality:

| Defeat Simulation | Description |
|---|---|
| Husky T-MDV | The Husky T-MDV vehicle has the following hazard-defeat mechanisms:<br>• Interrogator Arm (IA).<br>• Mine Detonation Trailer (MDT). For more information, see Trailer in the VBS4 Trainee Manual.<br>• Force Protection Electronic Counter-Measures (FPECM). |
| Buffalo | The Buffalo vehicle (see Using the Buffalo in the VBS4 Trainee Manual) can use its arm to pick an IED and move it to a safe location, where it can be destroyed. |
| Mine Clearing Roller Vehicle | Any of the supported Mine Clearing Roller vehicles (see Using Mine Clearing Rollers in the VBS4 Trainee Manual) can roll over mines and detonate them. |

| Defeat Simulation | Description |
|---|---|
| MICLIC Vehicle | Any of the supported MICLIC vehicles (see Using MICLIC in the VBS4 Trainee Manual) can use the MICLIC launcher to detonate hazards. |
| CREW Device | A CREW device can be used to disable certain IEDs from being triggered.<br>For more information, see Using CREW in the VBS4 Trainee Manual. |
| UGV | A UGV, such as the Talon EOD can be used to remove and destroy IEDs.<br>For more information, see in the VBS4 Trainee Manual. |
| EOD Bombsuit Technician | The **US USMC Desert / Woodland > EOD - Bombsuit Technician** unit can use 3D World Actions (see the VBS4 Trainee Manual) to disarm IEDs and mark mines.<br>For more information, see Using Improvised Explosive Devices (IEDs) and Mine Marker Kit in the VBS4 Trainee Manual. |

If damage is sustained in the process of defeating the hazards, any of the following functionality is available:

- Damaged equipment and / or vehicles can be towed away.

  For more information, see Towing Vehicles in the VBS4 Trainee Manual.

- Wounded units can request medical assistance from medics.

# 11.5 Artillery Support in VBS Plan

VBS Plan works together with VBS Call for Fire, and supports the execution of fire missions by all artillery tactical units in all the available ORBATs. These fire missions can be built in VBS Plan and are converted to VBS Call for Fire fire missions and gunlines that can be accessed and modified through the Fire Direction Center (FDC) UI (see VBS Call for Fire - FDC UI in the VBS Call for Fire Manual).

Add fire missions in VBS Plan using the Fire Mission Order (see Fire Mission Order Tool in the VBS Plan Manual).

In addition, VBS Plan supports tactical defense behaviors for all tactical units, besides artillery.

Add defense behaviors in VBS Plan using the Defend Order (see Defend Order Tool in the VBS Plan Manual).

For a walkthrough example of an artillery and defense scenario, see:

- Artillery Support in VBS Plan Example (below)

The general workflow of an artillery and defense simulation in VBS4 contains two parts:

- Artillery Support Preparation (on page 233)
- Artillery Support Execution (on page 233)

## 11.5.1 Artillery Support in VBS Plan Example

The purpose of this example is to create an AU Army scenario with artillery and defense behaviors using VBS Plan.

The scenario takes place in Australia and consists of the following Tactical Units (see Units Tool in the VBS Plan Manual) and ambient wildlife:

- BLUFOR AU Army units:
  - 1 Artillery Battery (M777)
  - 1 Troop (M1A1)
  - 2 Platoon (M113A4)
- OPFOR units:
  - 1 Platoon (BMP-2)
  - 1 Platoon (T-80)
- Ambient wildlife:
  - Kangaroos

**Scenario Execution Workflow**

> **NOTE**
>
> Times are set in relation to the Elapsed / Mission Time, whichever is used. For more information, see Synchronize Time in the VBS4 Editor Manual.

1. **2 Platoon (M113A4)** execute an Advance Order (see Advance Order Tool in the VBS Plan Manual) and Assault Order (see Assault Order Tool in the VBS Plan Manual) on **1 Platoon (BMP-2)**, while the latter execute a Defend Order (see Defend Order Tool in the VBS Plan Manual).
2. **1 Troop (M1A1)** execute Suppress Orders (see Suppress Order Tool in the VBS Plan Manual) using an Objective Control Measure (see Objective Tool in the VBS Plan Manual) on **1 Platoon (BMP-2)**, while the latter continue executing the Defend Order.
3. **1 Artillery Battery (M777)** fire at **1 Platoon (BMP-2)** using the Fire Mission Order (see Fire Mission Order Tool in the VBS Plan Manual) and Target Control Measure (see Target Tool in the VBS Plan Manual).
4. **1 Platoon (T-80)** counterattacks **2 Platoon (M113A4)** and **1 Troop (M1A1)** using an Assault Order, while **1 Artillery Battery (M777)** executes a fire mission using VBS Call for Fire (see VBS Call for Fire - FDC UI and VBS Call for Fire Mission Management in the VBS Call for Fire Manual) on **1 Platoon (T-80)**.

The scenario is divided into Preparation and Execution phases:

- Artillery Support Example Preparation (below)
- Artillery Support Example Execution (on page 232)

### 11.5.1.1 Artillery Support Example Preparation

The Preparation phase consists of creating the Battlespace located in Australia, setting up the Tactical Units, Orders, Control Measures, and ambient wildlife.

**Follow these steps:**

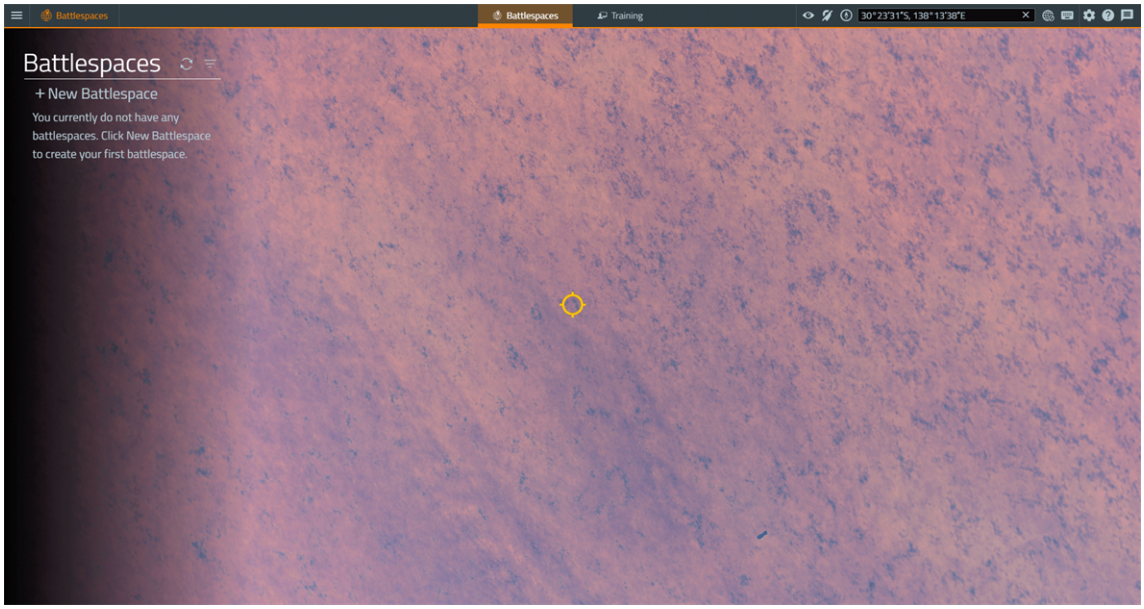
1. In the VBS4 Toolbar of the Battlespaces Mode, select the **Battlespaces** tab.

   > **NOTE**
   >
   > When starting the VBS4 Admin Client, the Battlespaces tab is selected by default.

2. In the Search Bar of the VBS4 Toolbar, input the coordinates **30°23'31"S, 138°13'38"E**, and then press **Enter**.

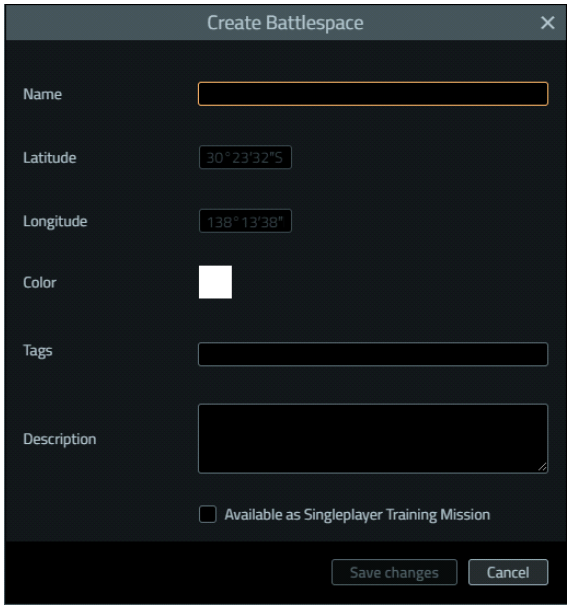
   The Whole-Earth Terrain rotates directly above the specified location in Australia.

   Use the **Mouse Scroll Wheel** to zoom in to view the area displayed.




3. Click **+ New Battlespace** and click the location of the **yellow** circle.

   The Create Battlespace dialog opens, displaying the selected coordinates.

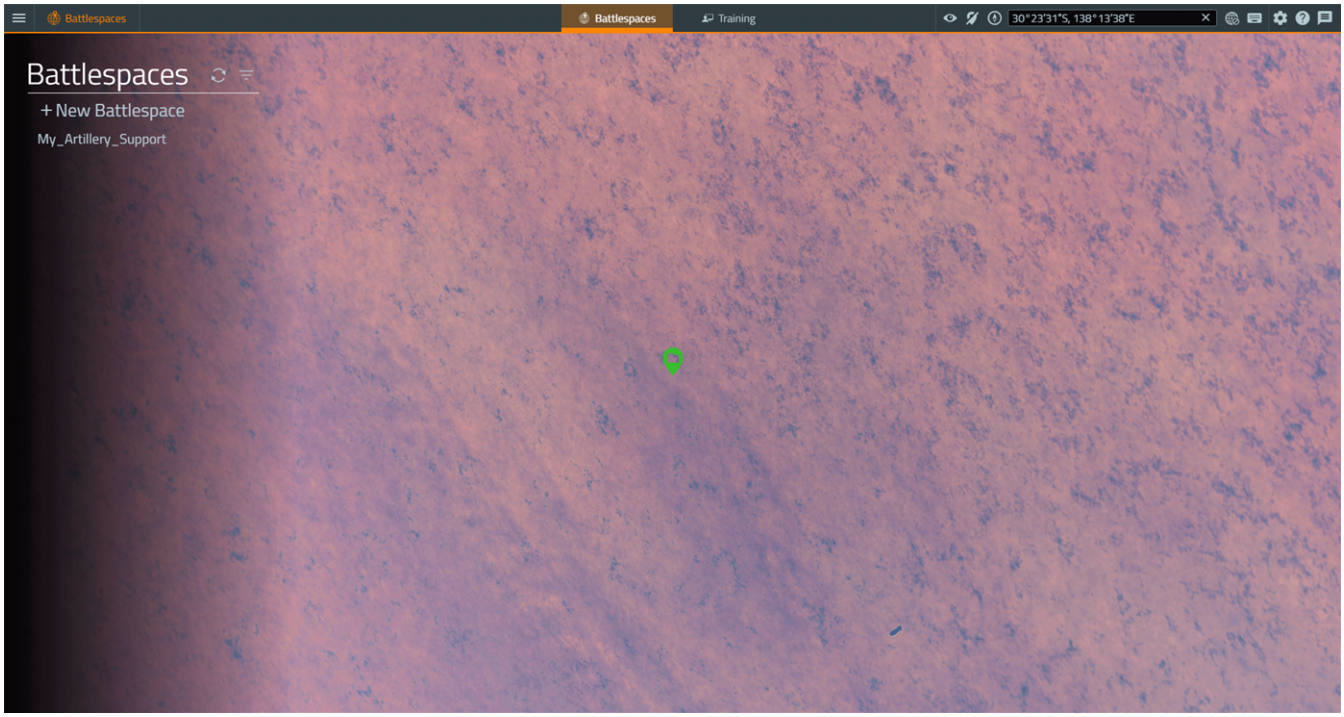


4. Input the following details in the Create Battlespace dialog:

| Parameter | Value |
|---|---|
| **Name** | My_Artillery_Support |
| **Color** | **Green** #36b82c |
| **Tags** | MyUseCase |
| **Description** | Artillery Support Use Case |

5. Click **Save Changes**.

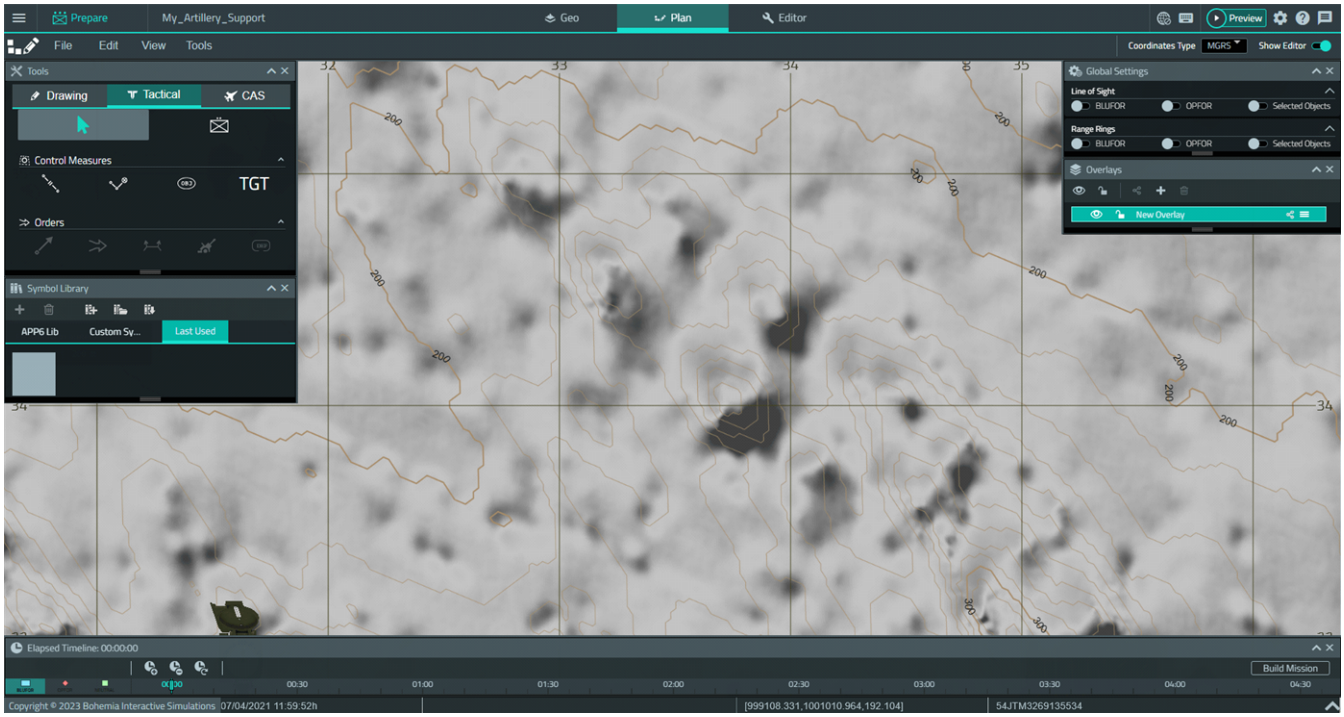
   VBS4 adds the Battlespace to the Battlespaces List.



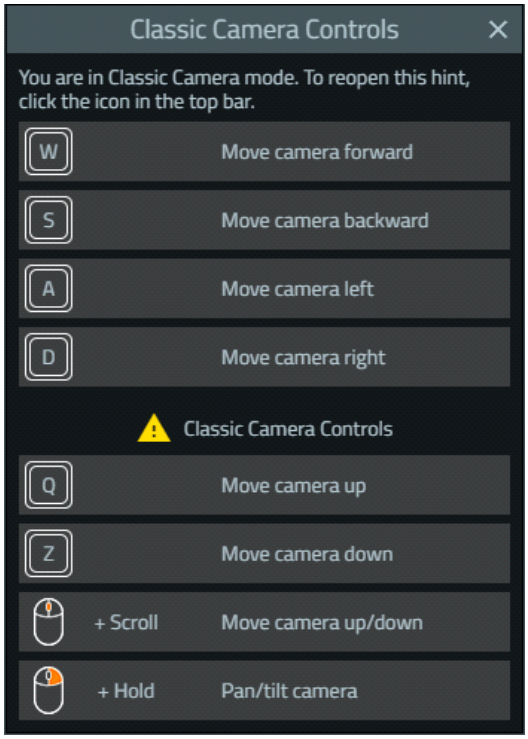

6. Select the newly created **My_Artillery_Support** Battlespace to show a **green** icon added to the Whole-Earth Terrain in the designated location.

7. Under **Prepare > Plan**, click **Create**.

   The Battlespace opens in VBS Plan (Prepare mode) in the 2D View.

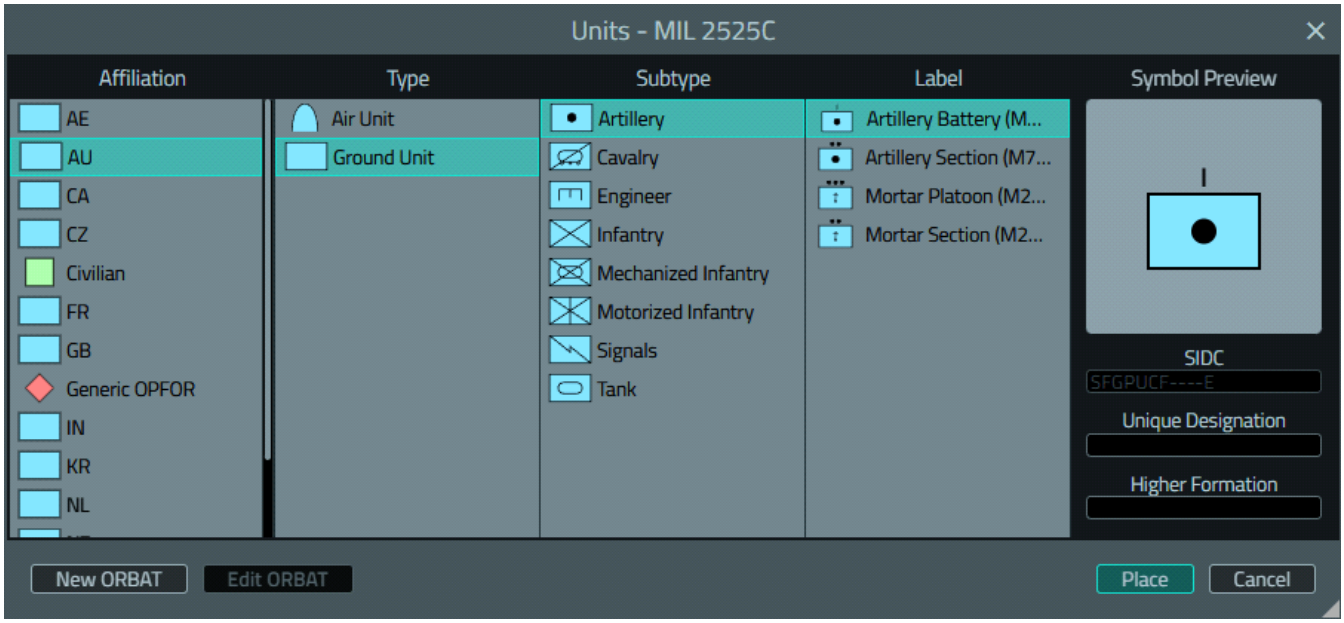



   Use the Classic Camera Controls to move the camera:



8. In the Tools Panel, select the **Tactical** tab and click the **Units Tool**.

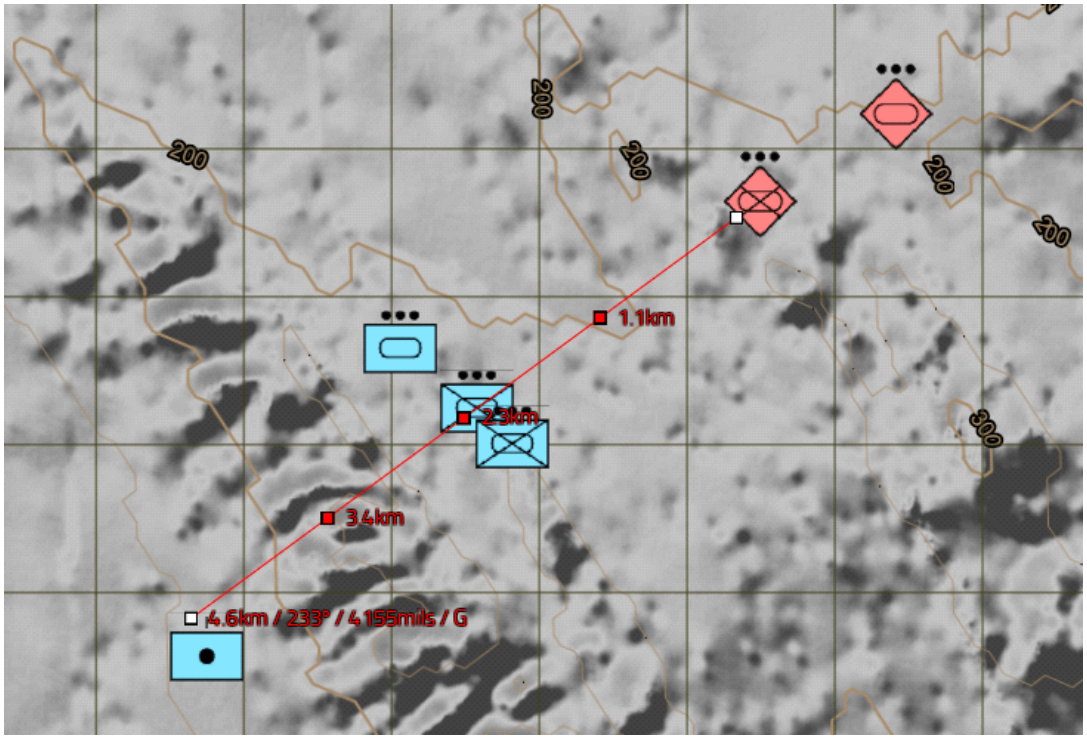
The Tactical Units table appears (you can drag the bottom-right corner to resize the table).




9. Place the following Tactical Units next to one another:
   - One **AU > Ground Unit > Artillery > Artillery Battery (M777)**
   - One **AU > Ground Unit > Tank > Troop (M1A1)**
   - Two **AU > Ground Unit > Mechanised Inf. > Platoon (M113A4)**
   - One **Generic Opfor > Ground Unit > Mechanized Infantry > Platoon (BMP-2)**
   - One **Generic Opfor > Ground Unit > Armor > Platoon (T-80)**

   Select a unit in the Tactical Units table, click **Place** (the Tactical Units table disappears - repeat the previous step to open the table again to select the other units), then click a position on the map to place the unit.

10. Drag the Tactical Units so that the positioning is as follows:




**NOTE**

Position **Artillery Battery (M777)** about 4.6 km from **Platoon (BMP-2)**.

**TIP**

To measure the distance from the target, in the VBS4 Toolbar, select **Editor** and use the Measure Distance Tool in the VBS4 Editor Manual. After measuring the distance, you can delete the distance line, to avoid object cluttering.

The distance is measured between the VBS Plan unit symbols, rather than the built units (see step 18), and serves as an approximation of how the units should be positioned in relation to one another.

To go back to VBS Plan, select **Plan** in the VBS4 Toolbar.

11. Add a BLUFOR artillery Target:
    a. In the Tools Panel, select the **Tactical** tab.
    b. Expand **Control Measures** (expanded by default).

    c. Click the **Target Tool**.

    d. Click near **Platoon (BMP-2)**.
    e. Set the following Specific Properties for the Target:

| Specific Property | Value |
|---|---|
| **Target Type** | Rectangular |
| **Azimuth** | 802 |
| **Width** | 400 |
| **Length** | 300 |
| **Name** | Artillery Target |

    f. Click **Create New Target**.

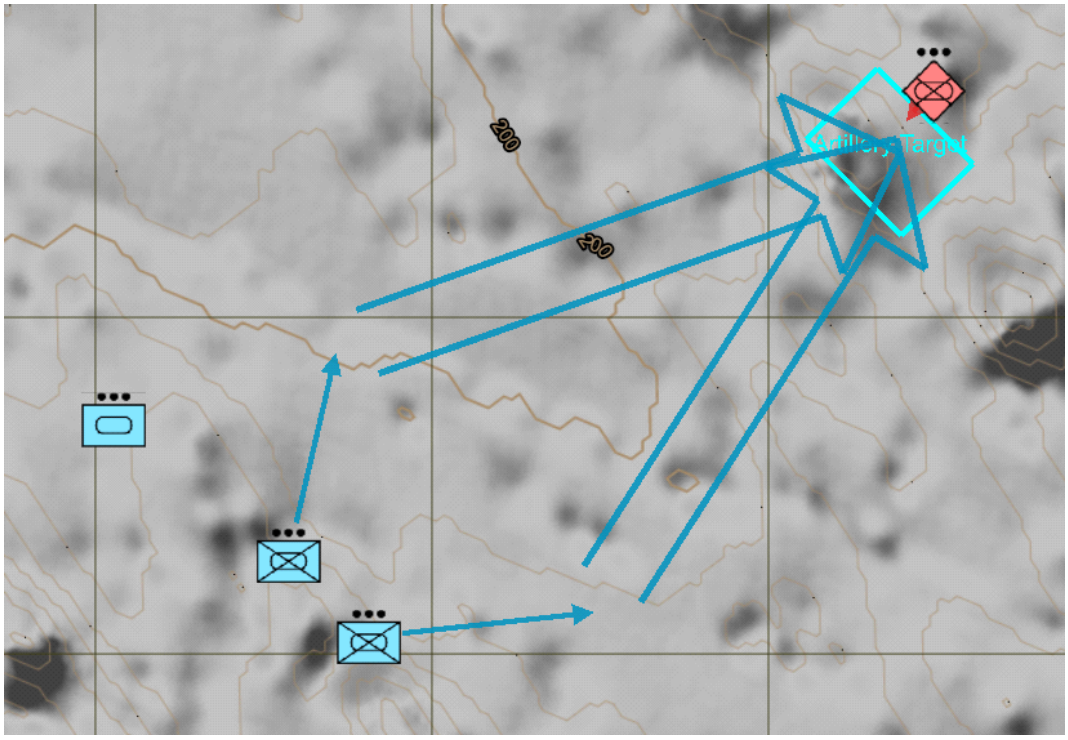
    The artillery Target is created.

12. Add a BLUFOR **Artillery Battery (M777)** Fire Mission Order:
    a. Right-click **Artillery Battery (M777)** and select **Add Fire Mission Order**.
    b. Set the following Specific Properties for the Fire Mission Order:

| Specific Property | Value |
|---|---|
| **Available Targets** | **Artillery Target** (should already be set if no other Targets are created) |
| **Rounds per Minute** | 3 |
| **Ammo Type** | HE |
| **Time on Target** | 00:04 |
| **End Time** | 00:09 |

13. Add BLUFOR **Platoon (M113A4)** Move and Assault Orders:
    a. Right-click a **Platoon (M113A4)** and select **Add Advance Order**.
    b. Move the mouse to a position between **Platoon (M113A4)** and **Platoon (BMP-2)**, and double-click it.

       A Advance Order is created.
    c. Right-click the Advance Order and select **Add Assault Order**.
    d. Move the mouse to a position next to **Platoon (BMP-2)** and double-click it.
    e. Repeat for the other **Platoon (M113A4)**.
    f. Drag the Advance Orders so that the positioning is as follows:



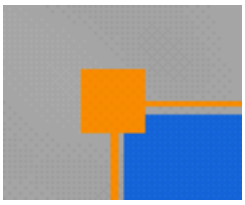
14. Add a BLUFOR Objective:
    a. In the Tools Panel, select the **Tactical** tab.
    b. Expand **Control Measures** (expanded by default).


    c. Click the **Objective Tool**.


    d. Set the following Specific Properties:

| Specific Property | Value |
|---|---|
| **Name** | OPFOR BMP |
| **Font** | Arial |
| **Font Size** | 50m |
| **Render Text on Surface** | Selected |

    e. Place the Objective:
        i. Click near the position of **Platoon (BMP-2)** and hold the **LMB**.
        ii. Drag the mouse and release the **LMB** to set the initial size.
        iii. Drag any of the bounding-box points to change the Objective size, so that the Objective name fits in the Objective shape.



15. Add BLUFOR **Troop (M1A1)** Suppress Orders:
    a. Right-click **Troop (M1A1)** and select **Add Suppress Order**.
    b. Move the mouse to a position east of **Troop (M1A1)** and click it.
    c. Move the mouse to rotate the Suppress Order, so that it faces in the direction of **Platoon (BMP-2)**. Click to confirm.
    d. Click the Suppress Order and in **Orders > Selected Order Properties** set the following Specific Properties:

| Specific Property | Value |
|---|---|
| **Objective** | OPFOR BMP (should already be set, if no other Objectives are created) |
| **Start Time** | 00:09 |
| **End Time** | 00:11 |

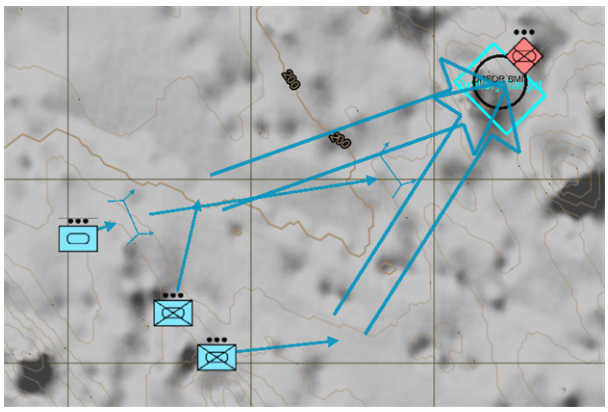
    e. Right-click the Suppress Order and select **Add Suppress Order**.
    f. Move the mouse to a position east of the Suppress Order and click it.

    Another Support by Order is created.

    g. Rotate the Support by Order to face **Platoon (BMP-2)**, click to confirm, and in **Orders > Selected Order Properties** set the following Specific Properties:

| Specific Property | Value |
|---|---|
| **Objective** | OPFOR BMP (should already be set, if no other Objectives are created) |
| **Start Time** | 00:16 |
| **End Time** | 00:17 |

    The Suppress Orders should look like this:



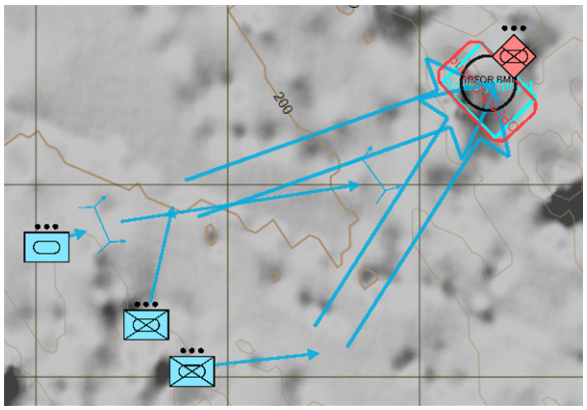
16. Add an OPFOR **Platoon (BMP-2)** Defend Order:
    a. Right-click **Platoon (BMP-2)** and select **Add Defend Order**.

       The Defend Order symbol is attached to the cursor.

    b. Move the mouse to a position near and southwest of **Platoon (BMP-2)**, and click it.

    c. Move the mouse to rotate the Defend Order, so that it faces in the direction of the non-artillery BLUFOR Tactical Units. Double-click to confirm.

       The Defend Order is created and should look like this:



    d. In **Orders > Selected Order Properties**, set the following Specific Properties for the Defend Order:

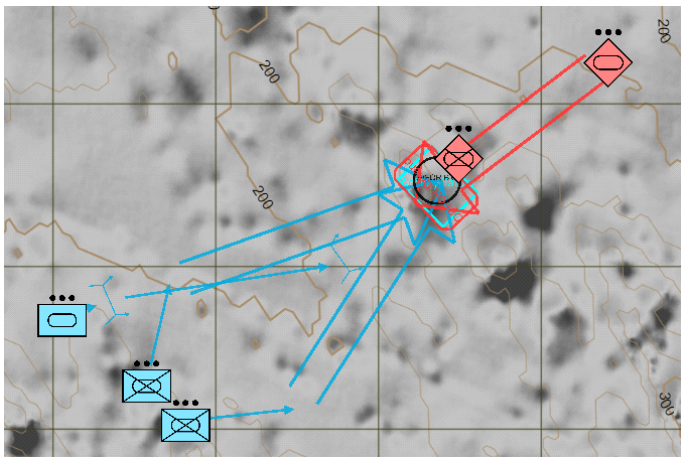
| Specific Property | Value |
|---|---|
| **Text** | OPFOR Defend |
| **Start Time** | 00:01 |
| **End Time** | 00:06 |

17. Add an OPFOR **Platoon (T-80)** Assault Order for a counterattack:
    a. Right-click a **Platoon (T-80)** and select **Add Assault Order**.
    b. Set the following Specific Properties for the Assault Order:

| Specific Property | Value |
|---|---|
| **Start Time** | 00:20 |
| **Lane Width** | 200 |

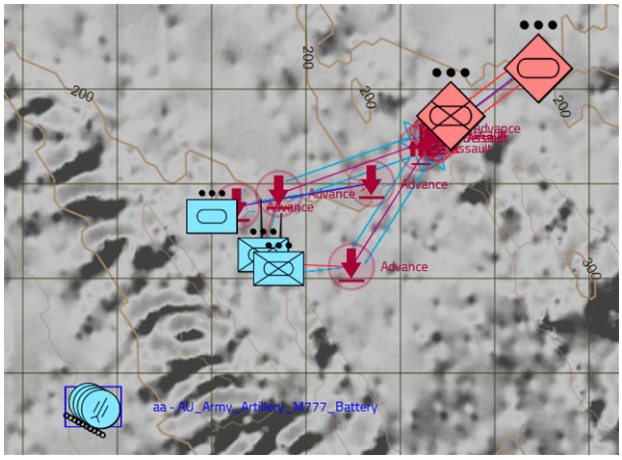
    c. Double-click a position in the Defend Order rectangle.

    The Assault Order should look like this:




18. Click **Build Mission**.

    The Plan symbols are converted into mission entities and VBS Call for Fire fire missions and gunlines:



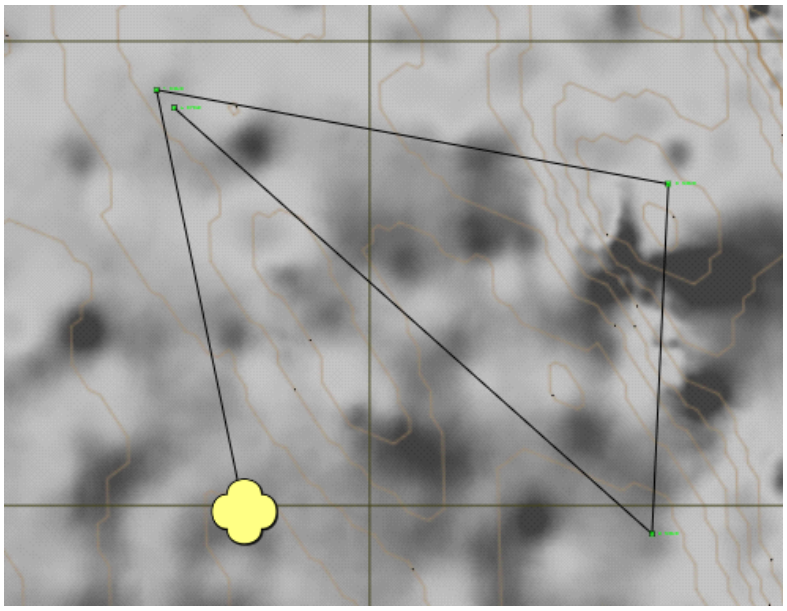

    For more information, see Build Missions in the VBS Plan Manual.

19. Add Australian ambient wildlife (kangaroos):
    a. In the VBS4 Toolbar, select **Editor**.
    b. In the Editor Objects List, select **(F1) Unit**.
    c. Click a location where you want to place a kangaroo.
    d. In the Object Properties dialog, type **Kangaroo** in **Filters** or select **Animals > Kangaroo**.
    e. Select **Game AI** as the AI type, and click **OK**.
    f. Right-click the kangaroo and select **Orders > Assign New Waypoint**.
    g. Click a location where you want the kangaroo to move.

       The Waypoint Object Properties dialog opens.
    h. Expand the **Type** drop-down, select **MOVE**, and click **OK**.
    i. Right-click the kangaroo and select **Add New Waypoint**.
    j. Add more waypoints as described in the previous step, and set the final waypoint to be next to the first waypoint.
    k. Right-click the final waypoint, and select **Edit Object**.

       The Waypoint Object Properties dialog opens.
    l. Expand the **Type** drop-down, select **CYCLE**, and click **OK**.

       The kangaroo waypoints should look like this:

    m. Repeat for more kangaroos, as required.

20. Add a player unit for the scenario administrator:
    a. In the Editor Objects List, select **(F1) Unit**.
    b. Click a location in the vicinity of the kangaroos.
    c. In the Object Properties dialog, select **VBS Objects > Invisible spectator (RTE)**.
    d. Click **OK**.

The scenario is prepared for execution.

To run the scenario in Preview mode, press **Scenario Preview** (**H**).

**NOTE**

The Artillery and Defense Scenario is also available as a sample Battlespace in:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

Compare your version of the scenario to the sample by deploying the sample Battlespace to VBS4.

**Follow these steps:**

- For Online use cases, do the steps in Copy Battlespace (below) on the VBS World Server computer, and then synchronize the Battlespace on the VBS4 Client connected to VBS World Server.
- For Offline use cases, copy the Battlespace from the `\optional\` folder.

  **Copy Battlespace**

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (on page 83) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (on page 80) using **UseCase** as the filter.

Select the sample Battlespace and select **Prepare > Editor > Open** to review the Scenario using VBS Editor.

### 11.5.1.2 Artillery Support Example Execution

The Execution phase is related to phase 4 of the Scenario Execution Workflow (on page 218), where the scenario administrator switches to VBS Call for Fire from VBS Plan to assign a fire mission to **1 Artillery Battery (M777)** on **1 Platoon (T-80)** in real-time.

**Follow these steps:**

1. Wait for phases 1 - 3 of the Scenario Execution Workflow (on page 218) to finish, taking 20 minutes from the start of the scenario.
2. Press **Pause** (**Esc**) and in the VBS4 Toolbar, select **Editor**.
3. Click the Fire Direction Center (FDC) tab to open the FDC UI.

   
   
4. In the Main FDC Panel, select the **BLUFOR** tab and click **New Mission**.
5. Set the fire mission settings (leave the other settings with their default values):

| Setting | Value |
|---|---|
| **Mission Type** | Set to **Immediate Suppression**. |
| **Time on Target** | Set to **00:20:00**. |
| **Gunlines** | Check **AU_Army_Artillery M777 Battery**. |
| **Location** | Click the locator icon, and then click anywhere near **1 Platoon (T-80)**.  |
| **Trajectory** | Set to **High**. |
| **Control Type** | Set to **Continuous Fire**. |

6. Click **Process**, and then click **Schedule Mission**.

**1 Artillery Battery (M777)** executes a fire mission on **1 Platoon (T-80)**.

## 11.5.2 Artillery Support Preparation

As an administrator, use VBS Plan in Prepare mode to prepare an artillery and defense scenario.

**Follow these steps:**

1. Use VBS Plan to create a new Scenario, or edit an existing one.
2. Create BLUFOR artillery Units. See Create a Tactical Unit Object in the VBS Plan Manual.

   Examples of available artillery Tactical Units include:

   - **AU Army > Ground Unit > Artillery > Mortar Section (M252)**
   - **AU Army > Ground Unit > Artillery > Mortar Platoon (M252)**
   - **AU Army > Ground Unit > Artillery > Artillery Battery (M777)**
   - **AU Army > Ground Unit > Artillery > Artillery Section (M777)**
   - **US Army > Infantry Brigade > Rifle Company > Mortar Section**
3. Add Fire Mission Orders to the Units. See Create a Fire Mission Order in the VBS Plan Manual.
4. Add additional non-artillery BLUFOR and OPFOR Tactical Units.
5. Set up the non-artillery BLUFOR Tactical Units to attack the non-artillery OPFOR Tactical Units (for example, using the Move, Assault, or Suppress Orders - see Create an Advance Order, Create an Assault Order, or Create a Suppress Order in the VBS Plan Manual). Set up the non-artillery OPFOR Tactical Units to defend themselves from the non-artillery BLUFOR Tactical Units attack, as in Create a Defend Order.
6. Build a mission to convert the Tactical Plan symbols to mission entities and VBS Call for Fire fire missions and gunlines. See Build Missions in the VBS Plan Manual.
7. Preview and save the mission.

   For more information, see Scenario Preparation (on page 85) and Scenario Execution (on page 89).

## 11.5.3 Artillery Support Execution

Once the artillery and defense scenario is prepared by the administrator, it can be executed.

Start the Scenario and open VBS Editor.

For more information, see Scenario Execution (on page 89).

Use the Editor UI to modify the scenario as it runs.

In Preview or Execute mode, switch to VBS Call for Fire and modify the fire missions built in step 7 of Artillery Support Preparation (above) in real-time.

For more information, see Active Fire Missions in the VBS Call for Fire Manual.

# 11.6 Autonomous Vehicle Operations

VBS4 includes the Battlefield Information Systems Application (BISA) UI, as an extension to the VBS4 C2 View to enable command of Autonomous Vehicles (AVs) in integrated operations.

All technology and capabilities of AVs and BISA are loosely based on real-world technologies. VBS4 allows these systems to be quickly implemented and tested in the virtual-world to train doctrine, and Tactics, Techniques, and Procedures (TTP).

The BISA functionality is available for all unmanned vehicles with some limitations, but is specifically designed to work with a set of UK-exclusive AVs.

> **NOTE**
>
> In addition, any Land vehicle can be turned into an AV (use the autopilot mode). For more information, see AV Mission Preparation (on page 243).

For a full list of specific AV models, see Autonomous Vehicles List (on page 237).

Review Roles in BISA (on the next page) to understand how the ORBAT structure and permissions enables BISA functionality.

**Follow this process:**

1. Administrators or Mission Designers create an AV scenario.

   For more information, see AV Mission Preparation (on page 243).

2. Administrators or Instructors start and operate a networked AV scenario.

   For more information, see AV Mission Execution (on page 247).

3. Users join the AV scenario and control AVs using the BISA View (C2).

   For more information, see BISA Interface Overview in the VBS4 Trainee Manual.

4. Users and Administrators interact with AVs using the following functionality described in the VBS4 Trainee Manual:

   - Assigning AV Ownership
   - Commanding AVs
   - Using the Commander Machine Interface (CMI)
   - Using the Autonomous Vehicles (AV) Interface
   - Activating the AV Autopilot
   - Using the Driver Machine Interface (DMI)

5. During the scenario, AVs provide event reports in the Reports Panel (see the VBS4 Trainee Manual).

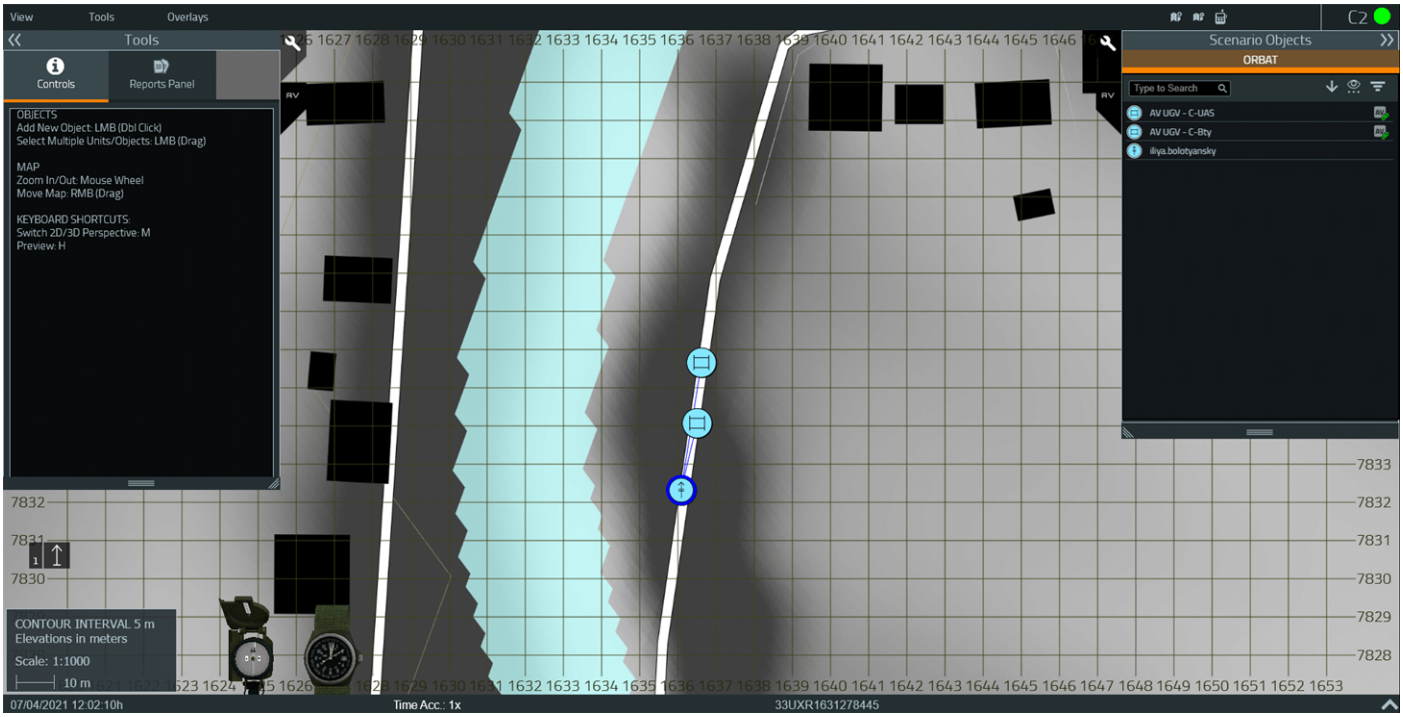
6. After an AV scenario, Instructors or users can review it using After Action Review (AAR).

   For more information, see the VBS4 After Action Review Manual.

## 11.6.1 Roles in BISA

Each participant in a scenario has their own view, and with information specific to them.

**Image-15: Commander view**




BISA displays information and access to functionality based on the following roles:

- **Administrators / Instructors**

  Run the scenario and have full control and visibility of BISA functionality using the Editor in Execute mode.

- **Commander**

  Commanders are defined by the ORBAT structure set up for the mission. A commander is part of a higher echelon with sections under them in the command structure. For more information, see Creating Command Structures in the VBS4 Editor Manual.

  Commanders have access to the following information in the Reports Panel (see the VBS4 Trainee Manual):

  - The locations of AVs in the scenario controlled by users in their command structure.
  - Receive reports from AVs in the scenario controlled by users in their command structure.
  - All waypoints in the scenario for AVs controlled by users in their command structure.

- **Section Leader**

  Section Leaders are defined by the leadership of their group as set up for the mission. For more information, see Adding Groups in the VBS4 Editor Manual.

  Section Leaders can assign AV Ownership to members of their group, as described in Assigning AV Ownership in the VBS4 Trainee Manual.

  Section Leaders have access to the following information in the Reports Panel (see the VBS4 Trainee Manual):

  - Locations of AVs assigned to members of their section.
  - They receive reports from AVs assigned to members of their section.
  - They can see all waypoints for AVs assigned to members of their section.

- **Trainee**

  Trainees are the remaining units and members of VBS4 groups, without leadership roles.

  Trainees can assign AV Ownership of unassigned AVs to themselves, as described in Assigning AV Ownership in the VBS4 Trainee Manual.

  Trainees have access to the following information in the Reports Panel (see the VBS4 Trainee Manual):

  - Locations of their own AVs.
  - They receive reports from their own AVs.
  - They only see waypoints for their own AVs.

## 11.6.2 Autonomous Vehicles List

VBS4 contains the following specific Autonomous Vehicle (AV) and AV-compatible models.

> **NOTE**
>
> Vehicles with **AV** in their model name are driverless, while vehicles without **AV** can be controlled by either a driver or operate as AVs (they are AV-compatible).
>
> In addition, you can make any Land vehicle AV-compatible using the **Autopilot** option in the vehicle Object Properties dialog in the Editor. For more information, see AV Mission Preparation (on page 243).

**GB Army AV - THeMIS UGV Variants**

> **NOTE**
>
> AVs in this category are equipped with the Wide Field of View (WFOV) camera. For more information, see Manual Control in Commanding AVs in the VBS4 Trainee Manual.

- **AV UGV - DFSup** - MILREM THeMIS with .50 cal HMG.
- **AV UGV - ATGW** - MILREM THeMIS with 4 x ATGMs.
- **AV UGV - C-UAS** - MILREM THeMIS with Directed Energy Weapon to counter UAS.
- **AV UGV - Recce** - Ground recce - MILREM THeMIS (TITAN Sentry).
- **AV UGV - IDF** - Artillery - 122mm rockets.
- **AV UGV - C-Bty** - Artillery / rockets locating.
- **AV UGV** - Base.
- **AV UGV - Small Arms** - MILREM THeMIS Resupply variant with small arms ammunition.
- **AV UGV - Heavy Arms** - MILREM THeMIS Resupply variant with heavy arms ammunition.
- **AV UGV - Medevac** - MILREM THeMIS Medevac variant equipped with 2 litters.

**GB Army AV - Support Vehicle Variants**

- **AV Support Vehicle - Supply** - Rations, medical supplies, spares - MAN SV Truck-esque.
- **AV Support Vehicle - Fuel** - Fuel / water - MAN SV Unit Support Tanker-esque.
- **AV Support Vehicle** - Ammo.
- **Support Vehicle 6T - Flat Platform** - 4 x 4 chassis, flat platform truck.
- **Support Vehicle 6T - Cargo** - 4 x 4 chassis, cargo truck.
- **Support Vehicle 6T - Troop Carrier** - 4 x 4 chassis, 14-seat troop carrier truck.

- **Support Vehicle 6T - Flat Platform, Crane** - 4 x 4 chassis, flat platform truck.
- **Support Vehicle 6T - Cargo, Crane** - 4 x 4 chassis, cargo truck with crane.
- **Support Vehicle 6T - Troop Carrier, Crane** - 4 x 4 chassis, 8-seat troop carrier truck with crane.
- **Support Vehicle 6T - Flat Platform, Up Armored** - 4 x 4 chassis, flat platform truck, cab up-armored.
- **Support Vehicle 6T - Cargo, Up Armored** - 4 x 4 chassis, cargo truck, cab up-armored.
- **Support Vehicle 6T - Troop Carrier, Up Armored** - 4 x 4 chassis, 14-seat troop carrier truck, cab up-armored.
- **Support Vehicle 6T - Flat Platform, Crane, Up Armored** - 4 x 4 chassis, flat platform truck, cab up-armored.
- **Support Vehicle 6T - Cargo, Crane, Up Armored** - 4 x 4 chassis, cargo truck with crane, cab up-armored.
- **Support Vehicle 6T - Troop Carrier, Crane, Up Armored** - 4 x 4 chassis, 8-seat troop carrier truck with crane, cab up-armored.
- **Support Vehicle 6T - Flat Platform, Up Armored, L7A2** - 4 x 4 chassis, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 6T - Cargo, Up Armored, L7A2** - 4 x 4 chassis, cargo truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 6T - Troop Carrier, Up Armored, L7A2** - 4 x 4 chassis, 14-seat troop carrier truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 6T - Flat Platform, Crane, Up Armored, L7A2** - 4 x 4 chassis, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 6T - Cargo, Crane, Up Armored, L7A2** - 4 x 4 chassis, cargo truck with crane, cab up-armored, L7A2 MG turret.
- **Support Vehicle 6T - Troop Carrier, Crane, Up Armored, L7A2** - 4 x 4 chassis, 8-seat troop carrier truck with crane, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T - Flat Platform** - 6 x 6 chassis, flat platform truck.
- **Support Vehicle 9T - Cargo** - 6 x 6 chassis, cargo truck.
- **Support Vehicle 9T - Troop Carrier** - 6 x 6 chassis, 14-seat troop carrier truck.
- **Support Vehicle 9T - Flat Platform, Crane** - 6 x 6 chassis, flat platform truck.
- **Support Vehicle 9T - Cargo, Crane** - 6 x 6 chassis, cargo truck with crane.
- **Support Vehicle 9T - Troop Carrier, Crane** - 6 x 6 chassis, 8-seat troop carrier truck with crane.
- **Support Vehicle 9T - Flat Platform, Up Armored** - 6 x 6 chassis, flat platform truck, cab up-armored.

- **Support Vehicle 9T - Cargo, Up Armored** - 6 x 6 chassis, cargo truck, cab up-armored.
- **Support Vehicle 9T - Troop Carrier, Up Armored** - 6 x 6 chassis, 14-seat troop carrier truck, cab up-armored.
- **Support Vehicle 9T - Flat Platform, Crane, Up Armored** - 6 x 6 chassis, flat platform truck, cab up-armored.
- **Support Vehicle 9T - Cargo, Crane, Up Armored** - 6 x 6 chassis, cargo truck with crane, cab up-armored.
- **Support Vehicle 9T - Troop Carrier, Crane, Up Armored** - 6 x 6 chassis, 8-seat troop carrier truck with crane, cab up-armored.
- **Support Vehicle 9T - Flat Platform, Up Armored, L7A2** - 6 x 6 chassis, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T - Cargo, Up Armored, L7A2** - 6 x 6 chassis, cargo truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T - Troop Carrier, Up Armored, L7A2** - 6 x 6 chassis, 14-seat troop carrier truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T - Flat Platform, Crane, Up Armored, L7A2** - 6 x 6 chassis, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T - Cargo, Crane, Up Armored, L7A2** - 6 x 6 chassis, cargo truck with crane, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T - Troop Carrier, Crane, Up Armored, L7A2** - 6 x 6 chassis, 8-seat troop carrier truck with crane, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T IMM - Flat Platform** - 6 x 6 chassis with improved mobility, flat platform truck.
- **Support Vehicle 9T IMM - Cargo** - 6 x 6 chassis with improved mobility, cargo truck.
- **Support Vehicle 9T IMM - Troop Carrier** - 6 x 6 chassis with improved mobility, 14-seat troop carrier truck.
- **Support Vehicle 9T IMM - Flat Platform, Crane** - 6 x 6 chassis with improved mobility, flat platform truck.
- **Support Vehicle 9T IMM - Cargo, Crane** - 6 x 6 chassis with improved mobility, cargo truck with crane.
- **Support Vehicle 9T IMM - Troop Carrier, Crane** - 6 x 6 chassis with improved mobility, 8-seat troop carrier truck with crane.
- **Support Vehicle 9T IMM - Flat Platform, Up Armored** - 6 x 6 chassis with improved mobility, flat platform truck, cab up-armored.

- **Support Vehicle 9T IMM - Cargo, Up Armored** - 6 x 6 chassis with improved mobility, cargo truck, cab up-armored.
- **Support Vehicle 9T IMM - Troop Carrier, Up Armored** - 6 x 6 chassis with improved mobility, 14-seat troop carrier truck, cab up-armored.
- **Support Vehicle 9T IMM - Flat Platform, Crane, Up Armored** - 6 x 6 chassis with improved mobility, flat platform truck, cab up-armored.
- **Support Vehicle 9T IMM - Cargo, Crane, Up Armored** - 6 x 6 chassis with improved mobility, cargo truck with crane, cab up-armored.
- **Support Vehicle 9T IMM - Troop Carrier, Crane, Up Armored** - 6 x 6 chassis with improved mobility, 8-seat troop carrier truck with crane, cab up-armored.
- **Support Vehicle 9T IMM - Flat Platform, Up Armored, L7A2** - 6 x 6 chassis with improved mobility, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T IMM - Cargo, Up Armored, L7A2** - 6 x 6 chassis with improved mobility, cargo truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T IMM - Troop Carrier, Up Armored, L7A2** - 6 x 6 chassis with improved mobility, 14-seat troop carrier truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T IMM - Flat Platform, Crane, Up Armored, L7A2** - 6 x 6 chassis with improved mobility, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T IMM - Cargo, Crane, Up Armored, L7A2** - 6 x 6 chassis with improved mobility, cargo truck with crane, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T IMM - Troop Carrier, Crane, Up Armored, L7A2** - 6 x 6 chassis with improved mobility, 8-seat troop carrier truck with crane, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T, UST** - 6 x 6 chassis, Unit Support Tanker.
- **Support Vehicle 9T, UST - Up Armored** - 6 x 6 chassis, Unit Support Tanker, cab up-armored.
- **Support Vehicle 9T, UST - Up Armored, L7A2** - 6 x 6 chassis, Unit Support Tanker, cab up-armored, L7A2 MG turret.
- **Support Vehicle 9T IMM, UST** - 6 x 6 chassis with improved mobility, Unit Support Tanker.
- **Support Vehicle 9T IMM, UST - Up Armored** - 6 x 6 chassis with improved mobility, Unit Support Tanker, cab up-armored.
- **Support Vehicle 9T IMM, UST - Up Armored, L7A2** - 6 x 6 chassis with improved mobility, Unit Support Tanker, cab up-armored, L7A2 MG turret.
- **Support Vehicle 15T - Flat Platform** - 8 x 8 chassis, flat platform truck.
- **Support Vehicle 15T - Cargo** - 8 x 8 chassis, cargo truck.
- **Support Vehicle 15T - Flat Platform, Crane** - 8 x 8 chassis, flat platform truck.
- **Support Vehicle 15T - Cargo, Crane** - 8 x 8 chassis, cargo truck with crane.

- **Support Vehicle, EPLS** - 8 x 8 chassis, with Enhanced Pallet Load System.
- **Support Vehicle 15T - Flat Platform, Up Armored** - 8 x 8 chassis, flat platform truck, cab up-armored.
- **Support Vehicle 15T - Cargo, Up Armored** - 8 x 8 chassis, cargo truck, cab up-armored.
- **Support Vehicle 15T - Flat Platform, Crane, Up Armored** - 8 x 8 chassis, flat platform truck, cab up-armored.
- **Support Vehicle 15T - Cargo, Crane, Up Armored** - 8 x 8 chassis, cargo truck with crane, cab up-armored.
- **Support Vehicle, EPLS - Up Armored** - 8 x 8 chassis, with Enhanced Pallet Load System, cab up-armored.
- **Support Vehicle 15T - Flat Platform, Up Armored, L7A2** - 8 x 8 chassis, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 15T - Cargo, Up Armored, L7A2** - 8 x 8 chassis, cargo truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 15T - Flat Platform, Crane, Up Armored, L7A2** - 8 x 8 chassis, flat platform truck, cab up-armored, L7A2 MG turret.
- **Support Vehicle 15T - Cargo, Crane, Up Armored, L7A2** - 8 x 8 chassis, cargo truck with crane, cab up-armored, L7A2 MG turret.
- **Support Vehicle, EPLS - Up Armored, L7A2** - 8 x 8 chassis, with Enhanced Pallet Load System, cab up-armored, L7A2 MG turret.
- **Support Vehicle, Recovery** - 8 x 8 chassis with improved mobility, vehicle recovery truck.
- **Support Vehicle, Recovery - Up Armored** - 8 x 8 chassis with improved mobility, vehicle recovery truck, cab up-armored.
- **Support Vehicle, Recovery - Up Armored, L7A2** - 8 x 8 chassis with improved mobility, vehicle recovery truck, cab up-armored, L7A2 MG turret.

**GB Army AV - DF Heavy Variants (Wheeled and Tracked)**

- **AV DF Heavy** - Armed with 120mm cannon, 7.62 x 51 coaxial machine gun, and smoke launcher.

**GB Army AV - ASV Air Variants**

- **ASV Air** - Medium quadcopter UAS. Unarmed.
- **ASV Air ATGW** - Large quadcopter UAS. Armed with 4 x Brimstone or Successor.

> **NOTE**
> These variants are only available under the **GB Army AV - Woodland** tab.

**GB Army AV - Centaur Variants**

> **NOTE**
>
> AVs in this category are equipped with the Wide Field of View (WFOV) camera. For more information, see Manual Control in Commanding AVs in the VBS4 Trainee Manual.

- **AV Centaur** - Base.
- **AV Centaur - Small Arms** - Resupply variant with small arms ammunition.
- **AV Centaur - Heavy Arms** - Resupply variant with heavy arms ammunition.
- **AV Centaur - Medevac** - Medevac variant equipped with 2 litters.

**GB Army AV - Malloy UAV Variants**

- **T150 UAS** - Base.
- **T150 UAS Small Arms** - Resupply variant with small arms ammunition.

## 11.6.3 AV Mission Preparation

One of the primary VBS Editor use cases for AVs is the creation of engaging and realistic training scenarios that demonstrate the capabilities of BISA for integrated AV operations.

Select a terrain and use VBS Editor in Prepare mode to add the personnel, vehicles, objectives, and hazards required for your AV training requirements.

**Follow these steps:**

1. Use VBS Editor to create a new Scenario, or edit an existing one.
2. Go to **View > Map Settings**:
   a. Click the **C2** tab, and check **Enable Autonomous Vehicles**.
   b. Click the **Icons** tab, and check **Show Side of Empty Vehicles**.
   c. In the **For BLUFOR Side** drop-down, select **Only Those on Player's Side**.
   d. Click **Apply**.

   For more information, see Map Settings in the VBS4 Editor Manual.
3. Use the Editor UI to add the units and groups required for your scenario, and create the ORBAT structure that defines the visibility and access to functionality for the different Roles in BISA (on page 235).

   For more information, see the following topics in the VBS4 Editor Manual:
   - Adding Unit
   - Adding Groups
   - Creating Command Structures
4. Use the Editor UI to add the autonomous vehicles required for the AV scenario.

   See Adding Vehicles in the VBS4 Editor Manual to add the available AVs.
   - GB Army AV - THeMIS UGV variants
   - GB Army AV - AV Support Vehicle variants
   - GB Army AV - AV DF Heavy variants
   - GB Army AV - ASV Air variants
   - GB Army AV - Centaur Variants
   - GB Army AV - Malloy UAV Variants

   For a full list of available AVs, see Autonomous Vehicles List (on page 237).

5. In addition, any Land vehicle can become AV-enabled and be used as an AV.

   For new vehicles:

   a. In the Object Properties dialog, click **Advanced** to expand the advanced vehicle options.

   b. In the **Autopilot** drop-down, select one of the following options:

   > **NOTE**
   >
   > The **Autopilot** drop-down is only available, if the following criteria is met:
   >
   > - The vehicle is a Land vehicle, and not already an AV (UGV / UAV).
   > - The AI type is set to **Control AI**.

   - **Not Available** - The vehicle is not used as an AV.
   - **Active** - The AV autopilot is active and the vehicle can be used as an AV.
   - **Inactive** - The AV autopilot is inactive and the vehicle cannot be used as an AV.

   > **TIP**
   >
   > For existing AV-enabled vehicles, you can change the autopilot state by double-clicking the vehicle on the map or in the Scenario Objects Panel, and in the Object Properties dialog, changing **Active** / **Inactive** in VBS Editor (Prepare / Execute Mode).

   c. Click **OK**.

   For existing vehicles, right-click a vehicle or a group of vehicles on the map or in the Scenario Objects Panel, and select **Autonomous Vehicle > Activate Autopilot / Deactivate Autopilot** to activate / deactivate the AV autopilot.

   Alternatively, you can set the autopilot mode for any Land vehicle, using the SQF commands: setAutopilotState (https://sqf.bisimulations.com/display/SQF/setAutopilotState), getAutopilotState (https://sqf.bisimulations.com/display/SQF/getAutopilotState), getAutopilot (https://sqf.bisimulations.com/display/SQF/getAutopilot).

   Use the Commander Machine Interface (CMI) Editor Object (see the VBS4 Editor Manual) to allow commanders to view the status information of each vehicle assigned to them, when the AV scenario runs.

6. Use Markers to designate specific areas in the terrain as threats.
   a. Press **F6** or select **(F6) Marker** from the Editor Objects List.
   b. Place your cursor on the map, and do one of the following:
      - Double-click the **LMB**.
      - Click the **RMB**, and select **New Object** from the context menu.

      The Object Properties dialog opens.
   c. Select **Ellipse** from the Category drop-down.
   d. **Size (Left-Right)** and **Size (Up-Down)** must be the same size to specify a circular area.
   e. Click **OK**.
   f. The Marker is placed on the map.

   AVs avoid the defined areas if **Avoid Threats** is set when defining their Waypoints, as described in AV Assign Waypoints in the VBS4 Trainee Manual.
7. Add Waypoints for your AVs to select from.
   a. Select **Control AI - Waypoints** from the Editor Objects List.
   b. Place your cursor on the map, and do one of the following:
      - Double-click the **LMB**.
      - Click the **RMB**, and select **New Object** from the context menu.

      The Object Properties dialog opens.
   c. In the **Behavior** list, select one of the following Waypoint types: **Convoy**, **UGV Control**, **UGV Control - Defend**.

      **NOTE**
      Only these waypoint types can be used with AVs.
   d. Set the Waypoint properties, as described in step 3 of AV Assign Waypoints (see the VBS4 Trainee Manual).

      **NOTE**
      AV Assign Waypoints describes how to create and assign waypoints.
   e. Click **OK**.

   The Waypoint is placed on the map.

8. Preview and save the mission.

   A saved Scenario is available for use in the Battlespaces List:

   - Play the Scenario as a single user.

     For information about controlling your character, see Character Control in the VBS4 Trainee Manual.

   - Use VBS Editor in Prepare mode to edit the Scenario.
   - For information about controlling AV objects and entities, see BISA Interface Overview in the VBS4 Trainee Manual.
   - Run the mission as a Networked Multiplayer mission as the administrator.

     For information about Execute mode, see AV Mission Execution (on the next page).

   - Use VBS Editor in Prepare mode to edit the mission.

For more information about the other objects and tools available, see the VBS4 Editor Manual.

## 11.6.4 AV Mission Execution

The most important Editor use case for AVs is the operation and administration of a multiplayer scenario during runtime.

Start a Multiplayer mission and use the VBS Editor to monitor the simulation users, manage the Scenario, and insert simulation objects, hazards, and events.

> **NOTE**
>
> A typical Scenario Execution use case requires a Dedicated Server to host the mission with the Administrator operating an Admin Client on the same network. For more information, see Dedicated Server in the VBS4 Administrator Manual.

**Follow these steps:**

1. Start a VBS4 instance as an Administrator, together with VBS4 instances for the other users (Commanders, Section Leaders, Trainees).
2. Select your Battlespace in the Battlespaces List, and use the **Execute** function in the Battlespace Functions Panel:
   - Highlight the Scenario name and click **Start**.

   VBS4 opens the Network Lobby.
3. In the Network Lobby, do the following:
   a. Assign users to characters, or allow users to select their own.
   b. **Optional:** Select any of the following:
      - To automatically start recording an After Action Review when the Scenario begins to execute, select **Record AAR**.
      - To skip the Mission Briefing, select **Skip Briefing**.
   c. Click **OK**.
4. The Mission Starts and displays the Mission Briefing view.

   > **NOTE**
   >
   > The Mission Briefing is skipped if **Skip Briefing** is selected in the Network Lobby.

   Once the Mission Briefing is completed, press **OK** to start the mission.
5. Press **Map** (**M**) or **Pause** (**Esc**), and select **Editor** to open VBS Editor in Execute mode.

Do any of the following when the scenario runs:

- Assign and reassign AVs as necessary.

  For more information, see Assigning AV Ownership in the VBS4 Trainee Manual.

- Give orders to AVs.

  For more information, see Commanding AVs in the VBS4 Trainee Manual.

- As an Administrator, reposition AVs and Waypoints as required if an AV gets stuck.
- Add Waypoints for your AVs to select from.

  1. Select **Control AI - Waypoints** from the Editor Objects List.
  2. Place your cursor on the map, and do one of the following:
     - Double-click the **LMB**.
     - Click the **RMB**, and select **New Object** from the context menu.

     The Object Properties dialog opens.
  3. In the **Behavior** list, select one of the following Waypoint types: **Convoy**, **UGV Control**, **UGV Control - Defend**.

     > **NOTE**
     > Only these waypoint types can be used with AVs.

  4. Set the Waypoint properties, as described in step 3 of AV Assign Waypoints (see the VBS4 Trainee Manual).

     > **NOTE**
     > AV Assign Waypoints describes how to create and assign waypoints.

  5. Click **OK**.

  The Waypoint is placed on the map.

- Change the AV autopilot on AV-enabled vehicles:
  - Right-click a single vehicle or group of vehicles on the map, in C2 ORBAT List, or in the Editor Scenario Objects Panel, and select **Autonomous Vehicle > Activate Autopilot / Deactivate Autopilot** to activate / deactivate the AV autopilot.
  - Use the vehicle Systems Menu.

    For more information, see Activating the AV Autopilot in the VBS4 Trainee Manual.

- Switch to Control AI drivers (see **Switch to Unit** in Entity Management in the VBS4 Instructor Manual) in AV-enabled vehicles to take control of their characters.

  > **NOTE**
  >
  > To switch to a Control AI driver, make sure to have the driver unit selected in the Scenario Objects Panel (see the Instructor Interface in the VBS4 Instructor Manual), rather than the vehicle itself.

- Use the DMI / CMI / AV interface.

  For more information, see the respective sections:

  - Using the Driver Machine Interface (DMI) in the VBS4 Trainee Manual.
  - Using the Commander Machine Interface (CMI) in the VBS4 Trainee Manual.
  - Using the Autonomous Vehicles (AV) Interface in the VBS4 Trainee Manual.

For more information about the other objects and tools available, see the VBS4 Editor Manual.

# 11.7 Aviation Combined Arms Training System

VBS4 provides Armed Reconnaissance Helicopter (ARH) model variants and additional functionality to enable ARH crews to participate in a greater range of training activities as part of the Aviation Combined Arms Training System (ACATS).

VBS4 delivers the variants and functionality as a set of features in VBS4.

## 11.7.1 ACATS ARH Model Variants

VBS4 adds to the existing ARH models with the following ACATS ARH model configurations:

| ACATS ARH Variant | ACATS ARH Model | Loadout Capacity |
|---|---|---|
| Reconnaissance | Recon - M781, Hydra, Hellfire | 2 Hellfire Missiles, 26 Rockets |
| Firepower | Firepower - M781, Hydra, Hellfire | 4 Hellfire Missiles, 33 Rockets |
| Anti-Tank | Anti-Tank - M781, Hydra, Hellfire | 8 Hellfire Missiles, 14 Rockets |

The ACATS ARH variants extend the base ARH models with the following additional functions:

- Night-Vision Compatible Aircraft Lighting
- Steerable Landing Light
- Improved Weapon Selection Dialogs
- Roof-Mounted Sight (RMS)
- Helmet-Mounted Sight Display (HMSD)

> **NOTE**
>
> The ACATS ARH variants are intended only for multi-user simulation. AI units cannot use ACATS ARH systems.

## 11.7.2 Configurable Weapon Loads

Mission Editors can customize the missile and rocket loads to create new ACATS ARH variants:

**Hellfire Missile Types:**

- AGM-114K Hellfire Missiles - laser-guided with a high-explosive warhead
- AGM-114L Hellfire Missiles - radar-guided with a high-explosive warhead
- AGM-114M Hellfire Missiles - laser-guided with a fragmentation / incendiary warhead

By default, the ACATS ARH variants load AGM-114K Hellfire missiles.

**70mm Hydra Rocket Types:**

- HE Rockets
- Anti-Materiel Rockets
- Flechette Rockets
- Smoke Rockets
- Illumination Rockets
- IR Illumination Rockets

By default, the ACATS ARH variants load HE Rockets.

For more information, see Customize the ARH Ammunition Load.

### 11.7.3 ACATS Mission Objects and Features

VBS4 includes the following features to support ACATS ARH training:

- Add Reference Marks to Missions
- Add Resupply Points to Missions
- Full helicopter flight and operational control as described in ACATS ARH Control Overview in the VBS4 Trainee Manual.
- Multi-weapon display in the ACATS ARH User View in the VBS4 Trainee Manual.
- AGM114 Hellfire Missiles simulation and lock-on modes.
- Mini-Map Navigation in the VBS4 Trainee Manual

# 11.8 CBRN Contamination

The purpose of the CBRN Contamination use case is provide procedural training to Trainees to detect, avoid, and mitigate chemical, biological, radiological, and nuclear contamination (CBRN) that may be encountered in the field.

A typical CBRN scenario consists of the following:

- Hazardous areas that produce CBRN contamination:
  - Mustard Gas
  - Chlorine Gas
  - Sarin Gas
  - Liquid Nerve Agent (LNA)
  - Radioactivity
- Units equipped with CBRN equipment:
  - CBRN Suits
  - CBRN Detection Equipment
  - CBRN and Area Markers
  - CBRN Decontamination Equipment

The general workflow of a CBRN simulation in VBS4 contains two parts:

- CBRN Preparation (on the next page)
- CBRN Execution (on page 254)

## 11.8.1 CBRN Preparation

As an administrator, use VBS Editor in Prepare mode to prepare a CBRN scenario.

**Follow these steps:**

1. Use VBS Editor to create a new Scenario, or edit an existing one.
2. Add any of the following hazards to the CBRN scenario:

| Hazard | Description |
|---|---|
| Hazardous Area | Place contaminated areas in your scenario. For more information, see Hazardous Area in the VBS4 Editor Manual. |
| OPFOR Munitions | VBS4 includes shells that contain chlorine, mustard, sarin gas, and liquid chemical agents that forms clouds around the impact area that disperse over time.<br>These shells may be used by OPFOR units and form part of a CBRN scenario.<br>Add the applicable vehicles to the scenario and modify their loadouts as required.<br>For more information, see Adding Vehicles and Creating Vehicle Variants in the VBS4 Editor Manual. |

3. VBS4 has units with specific equipment for CBRN, including the following:

| Unit | Description |
|---|---|
| US USMC | Specific USMC units are equipped with MOPP suits:<br>• **US USMC Desert / Woodland > Rifleman - M16A4 (NBC MOPP *N*)** |
| SE Army | All Swedish units have CBRN suit functionality as standard.<br>This is not simulated as equipment that they carry. |

> **NOTE**
>
> Other units may pick up and use CBRN equipment in the Scenario, or have the equipment added to their inventory.
>
> For more information, see Edit Equipment Loadout in the VBS4 Editor Manual.

Add personnel to the scenario.

For more information on placing units, see Adding Units in the VBS4 Editor Manual.

4. Add additional objects and equipment.

   VBS4 includes specific equipment for CBRN scenarios:

   - Area Marking Kit
   - CBRN Markers
   - CBRN Suits Crate
   - Decontamination Equipment
   - Detection Devices
   - M8 and M9 Chemical Detection Paper
   - SCBA Mask

   Place these objects directly in the scenario using the (F8) Objects option or equip units with them by adding them to their inventory.

   For more information, see CBRN Equipment, Adding Objects and Edit Equipment Loadout in the VBS4 Editor Manual.

5. Preview and save the mission.

   For more information, see Scenario Preparation (on page 85).

### 11.8.2 CBRN Execution

Once the CBRN scenario is prepared by the administrator, it can be executed.

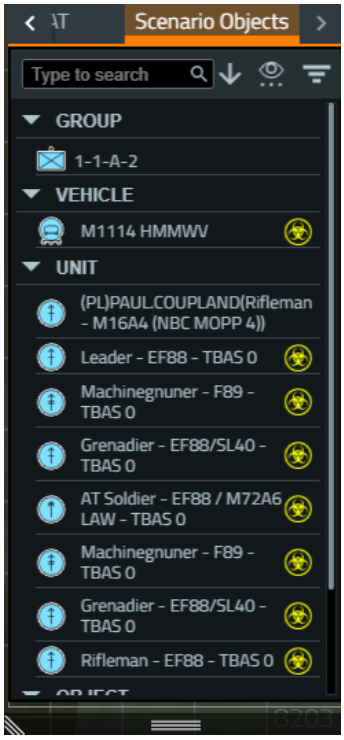
Start the Scenario and open VBS Editor.

For more information, see Scenario Execution (on page 89).

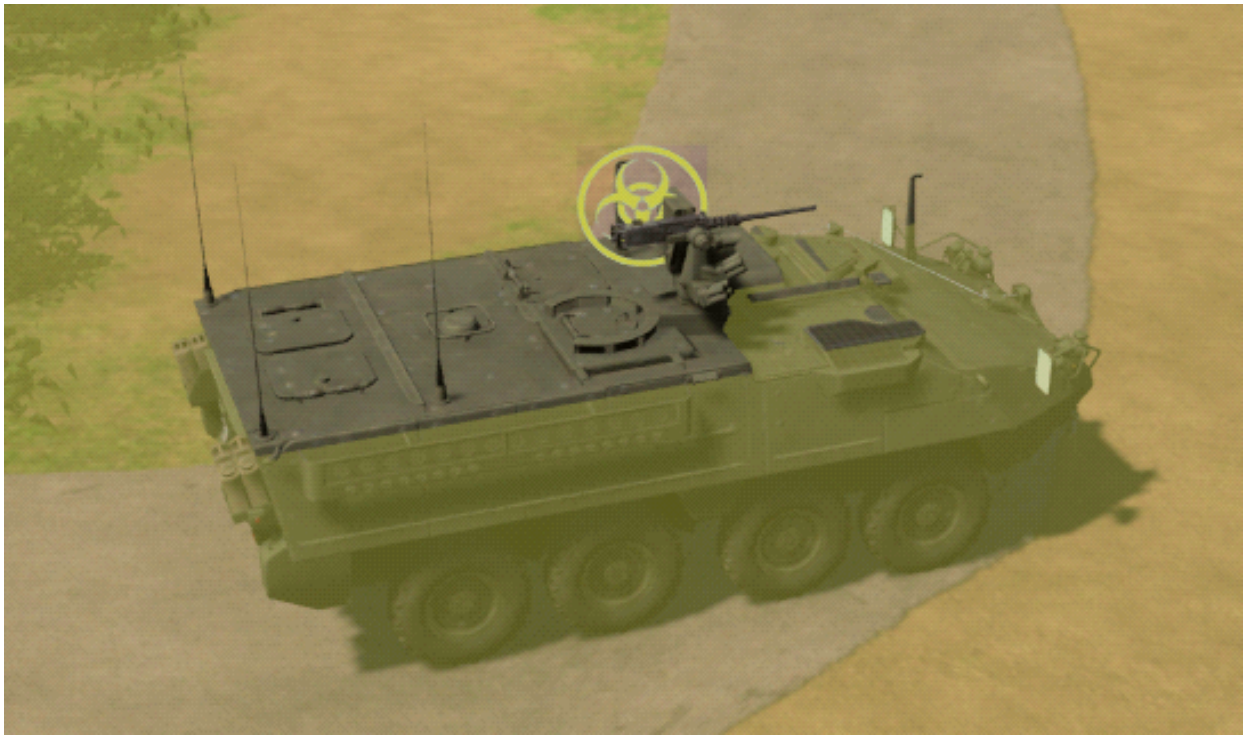
Use the Editor UI to modify the scenario as it runs.

A typical CBRN scenario has the following functionality:

1. Instructors monitor and manage contamination effects using VBS Editor in Execute mode:
    - The Scenario Objects List displays an overview of contaminated units and objects:




    - Contaminated units and objects display CBRN symbology in the 3D Camera View:



- Hazardous Areas may be added, edited, and individual entities may be decontaminated.

  For more information, see Hazardous Area in the VBS4 Editor Manual.

2. Trainees can use CBRN Suits to protect themselves from contamination:
   - CBRN Suits and Gas Masks
   - Swedish CBRN Protection

   **NOTE**

   Different levels of suit offer varying levels of protection to different types of contamination.

3. Trainees can use various equipment to detect CBRN contamination:
   - CBRN Detection Devices
   - M8 Chemical Detection Paper
   - M9 Chemical Detection Paper
4. Trainees can use markers and tape to mark contaminated areas:
   - Area Marking Kit
   - CBRN Markers
5. Trainees can use CBRN1 and CBRN3 Forms to report CBRN contamination:
   - CBRN1 and CBRN3 Forms
6. Trainees can use equipment to decontaminate themselves and other units or objects, or to treat units suffering the effects of contamination:
   - CBRN Decontamination

For more information on using CBRN Equipment, see the topics in the VBS4 Trainee Manual.

# 11.9 HX45M Bridge Laying (Land 155)

The HX45M vehicle simulates manual and Control AI-based (autonomous) Dry Support Bridge (DSB) laying capabilities.

There are two types of HX45M bridge-laying simulation:

| Bridge-Laying Simulation | Description |
|---|---|
| **AI Bridge Laying** | All the bridge-laying crew members are Control AI. |
| **Player Bridge Laying** | All the bridge-laying crew members are player-controlled. |

The general workflow of an HX45M bridge-laying scenario in VBS4 is:

- Bridge Laying Preparation (below)
- Bridge Laying Execution (on the next page)

## 11.9.1 Bridge Laying Preparation

As an administrator, use VBS Editor in Prepare mode to create an HX45M Bridge Laying Scenario.

**Follow these steps:**

1. Use VBS Editor to create a new Scenario, or edit an existing one.
2. VBS4 has vehicles with specific HX45M bridge-laying functionality:

   | Vehicle | Description |
   |---|---|
   | HX45M DSB | Bridge-builder vehicle with a crane. |
   | HX77 ILHS - Loaded | Vehicle with support modules (bridge segments). |
   | Haulmark 3axle - Loaded | Optional trailer, carrying support modules, that can be towed by the HX77 ILHS - Loaded vehicle. |

   For more information, see Bridge Laying Convoy AI in the VBS4 Editor Manual.

   Add vehicles to the scenario.

   For more information on placing vehicles, see Adding Vehicles in the VBS4 Editor Manual.
3. For **Player Bridge Laying**, place the bridge-laying vehicles and crews.

   **NOTE**

   Bridge-laying vehicles and crews do not need to be linked to form groups, and crews can start the scenario outside the vehicles.

4. For **AI Bridge Laying** do the following:
   a. Make sure that all crew members are in the bridge-laying vehicles (see the previous procedure step, and the difference between **(F4) Vehicle** and **(F5) Empty Vehicle** in the Editor Objects List).
   b. Make sure that all the vehicle crew members are controlled by **Control AI**. For more information, see the AI options in Edit Vehicle Options in the VBS4 Editor Manual.
   c. Link the bridge-laying vehicles into a group. For more information, see Creating and Adding to Groups with Links in the VBS4 Editor Manual.
   d. Add a bridge-laying Deploy DSB Order Waypoint.

      For more information, see Bridge Laying Convoy AI in the VBS4 Editor Manual.
5. Preview and save the mission.

   For more information, see Scenario Preparation (on page 85).

## 11.9.2 Bridge Laying Execution

Once the Bridge-Laying Scenario is prepared by the administrator, it can be executed.

Start the Scenario and open VBS Editor.

For more information, see Scenario Execution (on page 89).

A typical Bridge Laying scenario has the following phases:

1. For **Player Bridge Laying**, if the crew members are not in the vehicles, they enter them, occupying the required driver positions.

   Players use movement controls and 3D World Actions (see Interact with Vehicles Interface (IWV) in the VBS4 Trainee Manual) to enter the vehicles.
2. For **Player Bridge Laying**:

   As drivers, drive the vehicles into position and / or unload the support modules cargo, and operate the HX45M crane to construct and deploy the bridge.

   For more information, see:

   - Land Vehicle Controls in the VBS4 Trainee Manual.
   - Bridge Laying - HX45M in the VBS4 Trainee Manual.

   Use radio communication. For more information, see VBS Radio Overview (on page 141).

3. For **AI Bridge Laying**:

   If the Bridge Laying Preparation (on page 257) is done correctly and no bridge-laying errors appear during runtime, the bridge-laying vehicles:

   a. Drive to the Deploy DSB Order Waypoint.

   b. Park at their respective positions.

   c. The HX45M vehicle prepares the crane for construction.

   d. The HX45M vehicle constructs the bridge.

   e. The HX45M vehicle deploys the constructed bridge.

   If the Bridge Laying Preparation (on page 257) is done incorrectly and some bridge-laying errors appear during runtime, as an administrator, return back to Bridge Laying Preparation (on page 257) and resolve the errors accordingly.

   For more information, see Bridge Laying Convoy AI in the VBS4 Editor Manual.

# 11.10 Military Road Signs

VBS4 includes self-assembly road signs designed for use with convoy scenarios and route marking with the following features:

- Military road sign parts with assembly functionality.
- Modular sign posts, military road signs, and symbols.
- Crate objects that contain a predefined set of military road signs.
- Customize military road sign crates and vehicle cargo in the Editor.

Included with this release of VBS4 are a set of military road signs developed for French military use.

1. Scenario designers assign military road signs equipment to units in the mission, can pre-deploy placed signs, add sign crates as objects or vehicle cargo, and also create custom road sign crates and vehicle variants.

   For more information, see Military Road Signs - Scenario Design in the VBS4 Editor Manual.

2. Trainees use road sign parts, contained in ammo crates and carried by vehicles, to place and assemble road signs during a scenario.

   For more information, see Military Road Signs in the VBS4 Trainee Manual.

# 11.11 OPV River Class Trainer

The River Class ship in VBS4 is designed to simulate reservist usage and onboard orientation, to familiarize Trainees with its operation and layout.

The River Class ship structure simulation includes:

- The decks layout.
- The rooms layout.

The ship is manned with a default crew of the following units:

- 1 player unit in the ship Driver position.
- 2 AI units in the gunner positions, at the GPMG turrets.
- 1 AI unit in the gunner positions, at the GAMBO gun.
- 2 AI units in the gunner positions, at the Signal Lamps.

You can also watch the overview video at https://youtu.be/AELCt5J2Gp8.

**NOTE**

The videos may not be up to date with the features they demonstrate, the latest state of which is described in this manual.

**Image-16: View of the River Class ship**

The general workflow of the OPV River Class ship simulation in VBS4 is:

**OPV River Class Ship Preparation**

As a mission designer, create a River Class ship mission.

For more information, see Designing OPV River Class Missions in the VBS4 Editor Manual.

### OPV River Class Ship Execution

- As a player, interact with the River Class ship.

  For more information, see Using the OPV River Class in the VBS4 Trainee Manual.
- As an administrator, monitor the River Class ship activity.

  For more information, see Monitoring the OPV River Class in the VBS4 Instructor Manual.

# 11.12 Polish AFV Tank Trainer

The Polish AFV TT simulates the controls and functionality of the Leopard 2 A4 / A5 and PT-91 vehicles, using replica control joysticks connected to computers running VBS4.

The Polish AFV TT is used as a tank crew gunnery range trainer, and as a tool to provide platoon training for leadership.

**To prepare a Polish AFV TT mission, do the following:**

1. See Polish AFV Control Setup in the VBS4 Administrator Manual, to set up the AFV Commander and Gunner controls.

   Use VBS Editor to add the following implemented Leopard 2 A4 / A5 and PT-91 tank models (found under **PL Army Tracked - Woodland**) to missions:

   - Leopard 2A4
   - Leopard 2A5
   - PT-91

**To operate a Polish AFV TT mission, do the following:**

1. Start VBS4 on the Dedicated Server.
2. Start VBS4 on the clients, with the appropriate controller profiles.
3. Start the scenario from the instructor computer.
4. Join the scenario from the clients.
5. During the scenario, the AFV crew use the controls and panels for each role, as described in the VBS4 Trainee Manual:
   - Polish AFV TT Commander Control
   - Polish AFV TT Gunner Control