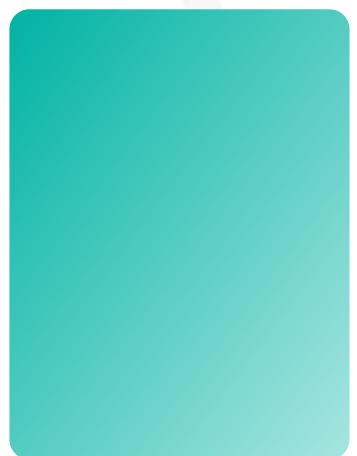


VBS Plan



VBS4 24.1.1



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The BISim Wiki is the primary resource on VBS4 scripting:

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PhysX

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

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



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1. VBS Plan Overview

VBS Plan allows you to plan a tactical mission, which is executed by Control AI or players, and create graphical overlays for mission planning and review.

VBS Plan is available in Prepare, Execute, Training, and Assess Modes.

VBS Plan can be used by Scenario Designers, Administrators, Instructors, and Trainees, providing the following features:

Use Tactical and Close Air Support (CAS) Tools to create Tactical Plans that include Tactical and CAS Units, Orders, and Control Measures:

- Add Tactical and CAS Units to the map that are:
 - Visible in 2D / 3D.
 - Converted to VBS4 entities. These VBS4 entities are Control AI-based and playable.
 - Based on the MIL-STD-2525C doctrine.
 - Available in the following ORBAT (Order of Battle) affiliations, based on the following country codes: AE, AU, CA, CZ, Civilian, FR, GB, Generic OPFOR, IN, KR, NL, NZ, SE, US.
- Give Tactical and CAS Orders to Tactical and CAS Units:
 - Advance Order Tool that allows you to give advance orders, visible in 2D / 3D, to Tactical Units.
 - Assault Order Tool that allows you to give assault orders, visible in 2D / 3D, to Tactical Units.
 - Suppress Order Tool that allows you to give fire support orders, visible in 2D / 3D, to Tactical Units.
 - Fire Mission Order Tool that allows you to give artillery fire orders, visible in 2D / 3D, to Tactical Units.
 - Defend Order Tool that allows you to give defend orders, visible in 2D / 3D, to Tactical Units.
 - CAS Mission Order Tool that allows you to create CAS missions for CAS Units, coordinated between Instructors and JTAC players.

- Add Tactical and CAS control measures that define significant locations on the map, using standard symbology, which are available for use in Tactical and CAS Orders:
 - Boundary Line Tool that allows you to demarcate the battlefield.
 - Phase Line Tool that allows you to specify operational timing and route planning to control and maneuver units.
 - Objective Tool that allows you to specify areas, where units need to move, as points for attack-by-fire missions.
 - Target Tool that allows you to specify targets for artillery units, executing Fire Mission Orders.
 - No Fly Zone (NFZ) Tool that enables you to indicate areas on the map where CAS flight is not allowed.
 - No Fire Area (NFA) Tool that enables you to indicate areas on the map where CAS firing is not allowed.
 - Control Point (CP) Tool that allows you to indicate points for fixed-wing CAS Unit check-ins with Air Control, prior to moving to the Initial Point (IP).
 - Initial Point (IP) Tool that allows you to indicate points for fixed-wing CAS Units as starting points for the run-in to the target.
 - Holding Area (HA) Tool that allows you to indicate points for rotary-wing CAS Unit check-ins and CAS briefing, prior to moving to the Battle Position (BP).
 - Battle Position (BP) Tool that allows you to indicate points for rotary-wing CAS Units to commence attacks on targets.
- Determine the line of sight of a given area, when placing Tactical and CAS objects.
- Timeline controls that enable you to see the Tactical Plan state at a given time, during mission execution.

Use Drawing Tools to create and display 2D map / 3D terrain overlays:

- Line Tool that allows you to draw various types of line, such as obstacles and boundary markers, visible in 2D / 3D.
- Freedraw Tool that provides freehand drawing on the map, visible in 2D / 3D.
- Text Tool that allows you to place text on the map, visible in 2D / 3D.
- Grid Tool that allows you to draw 2D grids on the map, also visible on the terrain.
- Unit Symbol Tool that allows you to:
 - Display unit symbols in 2D / 3D.
 - Place MIL-STD-2525C unit symbols on the map.

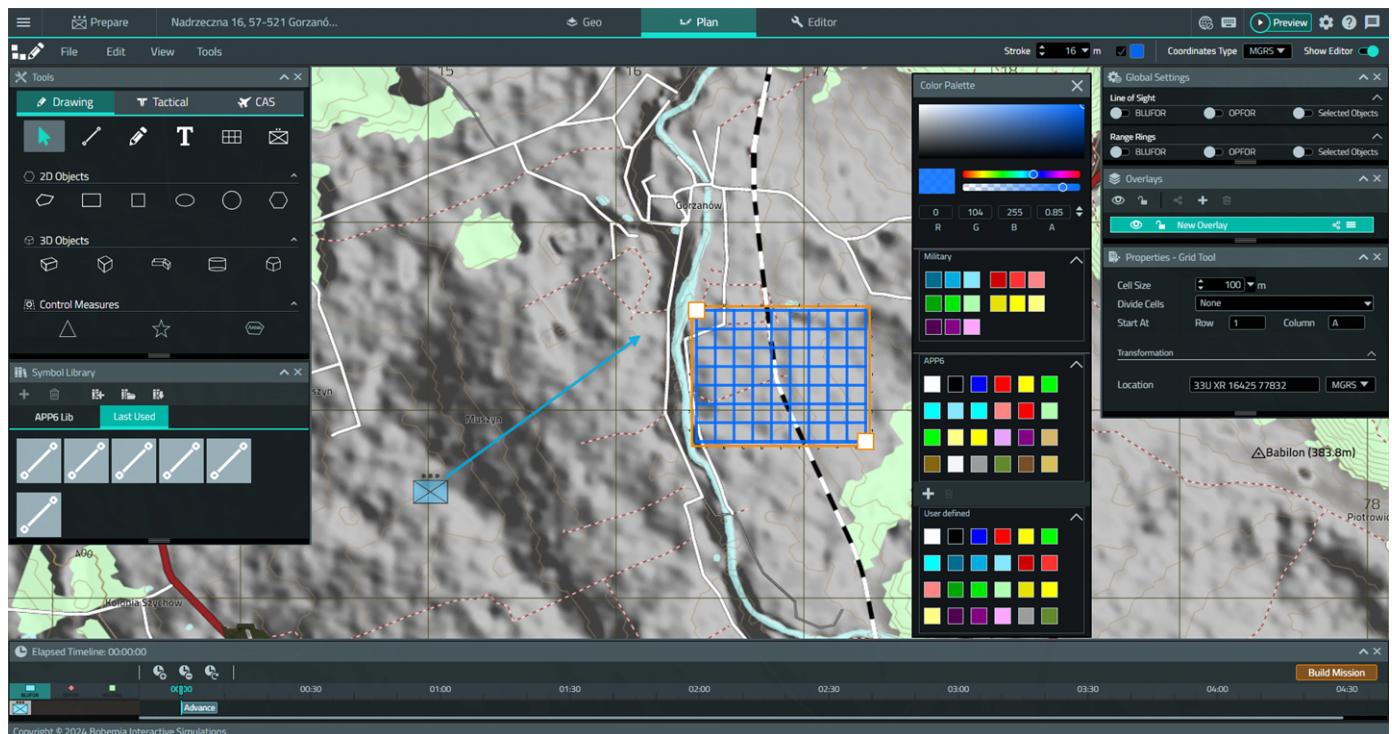
- 2D Shape Tools that allow you to draw 2D shapes (irregular polygon, rectangle, square, ellipse, circle, regular polygon) on the map, also visible on the terrain.
- 3D Shape Tools that allow you to draw 3D shapes (cuboid, cube, air corridor, cylinder, prism) on the terrain, also visible on the map.
- Tools for drawing the following control measures:
 - Friendly Area
 - Named Area of Interest
 - Target Area of Interest
 - Assembly Area
 - Assault Position
 - Decision Point
 - Observation Post

Use network collaboration to commit overlay changes in Drawing objects to shared overlays, during a multiplayer scenario in Execute Mode.

Import / export Tactical Plans, graphics, and overlays in various file formats.

Review tactical mission recordings in the After Action Review (AAR).

Image-1: VBS Plan UI



For a description of the VBS Plan UI, see the [VBS Plan UI Overview \(on page 18\)](#).

1.1 VBS Plan Workflow

The general VBS Plan workflow is as follows:

1. If necessary, import any preexisting content.

For more information, see [Import Content \(on page 52\)](#).

2. Create Tactical and CAS Objects to execute a mission, using the Tactical and CAS Tools:

- Use the [Line of Sight Tool \(on page 35\)](#) to determine the line of sight of a given area, when placing Tactical and CAS Objects.
- In the **Tactical** and **CAS** Tools tab of the [Tools Panel \(on page 23\)](#), click the Tactical or CAS Tool you want to select for Tactical Plan execution.
- Drag or delete control points to modify the shape of objects.
- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo object modifications (see also [Share Overlays - Considerations \(on page 216\)](#)).

For more information, see [Tactical Objects \(on page 53\)](#) and [CAS Objects \(on page 103\)](#).

You can also create your own custom ORBATs - see [Create Custom ORBATs \(on page 245\)](#).

3. Create graphic annotations, using the Drawing Tools:

- In the **Drawing** tools tab of the [Tools Panel \(on page 23\)](#), click the Drawing Tool you want to select to draw an object.
- Drag or delete control points to modify the shape of objects.
- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo object modifications (see also [Share Overlays - Considerations \(on page 216\)](#)).
- Use the [Symbol Library \(on page 208\)](#) to place custom symbols on the map.

For more information, see [Drawing Objects \(on page 157\)](#).

4. Do any of the following:

- Manage your overlay by showing / hiding, locking, and sharing overlays with other VBS Plan users.
- Add overlays to populate them with additional objects, based on steps 3 and 4.
- Delete old / unused overlays.

For more information, see [Managing Overlays \(on page 211\)](#).

5. If necessary, export the content.

For more information, see [Export Content \(on page 218\)](#).

6. Review your Tactical Plan.

For more information, see [Review Plans \(on page 219\)](#).

7. When you finish designing your Tactical Plan, either click **Build Mission** or select **File > Build Mission** to build it.

NOTE

You can only build a mission in **Prepare Mode**.

For more information, see [Build Missions \(on page 224\)](#).

8. To preview your Tactical Plan, select **Preview** in the VBS4 Toolbar (see VBS4 UI Overview in the Introduction to VBS4 Guide).

WARNING

You cannot preview a Tactical Plan that:

- Does not have at least one playable unit.
For more information, see [Units Tool \(on page 57\)](#).
- Is not built, using **Build Mission**.

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

TIP

To select a specific playable character, edit the wanted unit (from the list of units, created with **Build Mission**), using Edit Unit Options (see the VBS4 Editor Manual) in the Editor.

For more information, see Scenario Preparation in the Introduction to VBS4 Guide.

9. Save your Tactical Plan and built mission:

- a. Click the **Main Menu** icon.



- b. Under **Battlespaces**, select **Save**.

For more information, see [Save \(on page 21\)](#).

10. Execute the Tactical Plan.

Instructors see Tactical Orders that Tactical Units execute at in the Scenario.



For more information, see Scenario Execution in the Introduction to VBS4 Guide.

11. If necessary, use VBS Plan to create additional [Tactical Objects](#) (on page 53) and [Drawing Objects](#) (on page 157) in Execute Mode.

For more information, see [Share Overlays - Network Collaboration](#) (on page 215).

12. After the tactical mission finishes executing, review the tactical mission in the VBS Plan AAR.

For more information, see [VBS Plan in AAR](#) (on page 227) and [VBS Close Air Support \(CAS\) in AAR](#) (on page 231).

For a demonstration of some VBS Plan functionality in action, see the videos at <https://youtu.be/enT1a7BYc9M> and <https://youtu.be/EIXvPBIpCwo>.

 **NOTE**

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

1.2 Limitations

The following limitations apply:

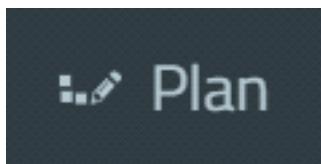
- **LCtrl + Y / LCtrl + Z (Undo / Redo):**
 - Hides the control point squares. You still keep the object selection, but to edit other control points, you must select the object again.
 - Undo / redo actions committed to an overlay at the same time by different users can cause incorrect positioning of drawings on one of the instances.
 - Dragging your cursor through color palettes breaks undo / redo (every single intermediate color is considered as one action).

For more information, see [Tactical Objects \(on page 53\)](#), [CAS Objects \(on page 103\)](#), and [Drawing Objects \(on page 157\)](#).

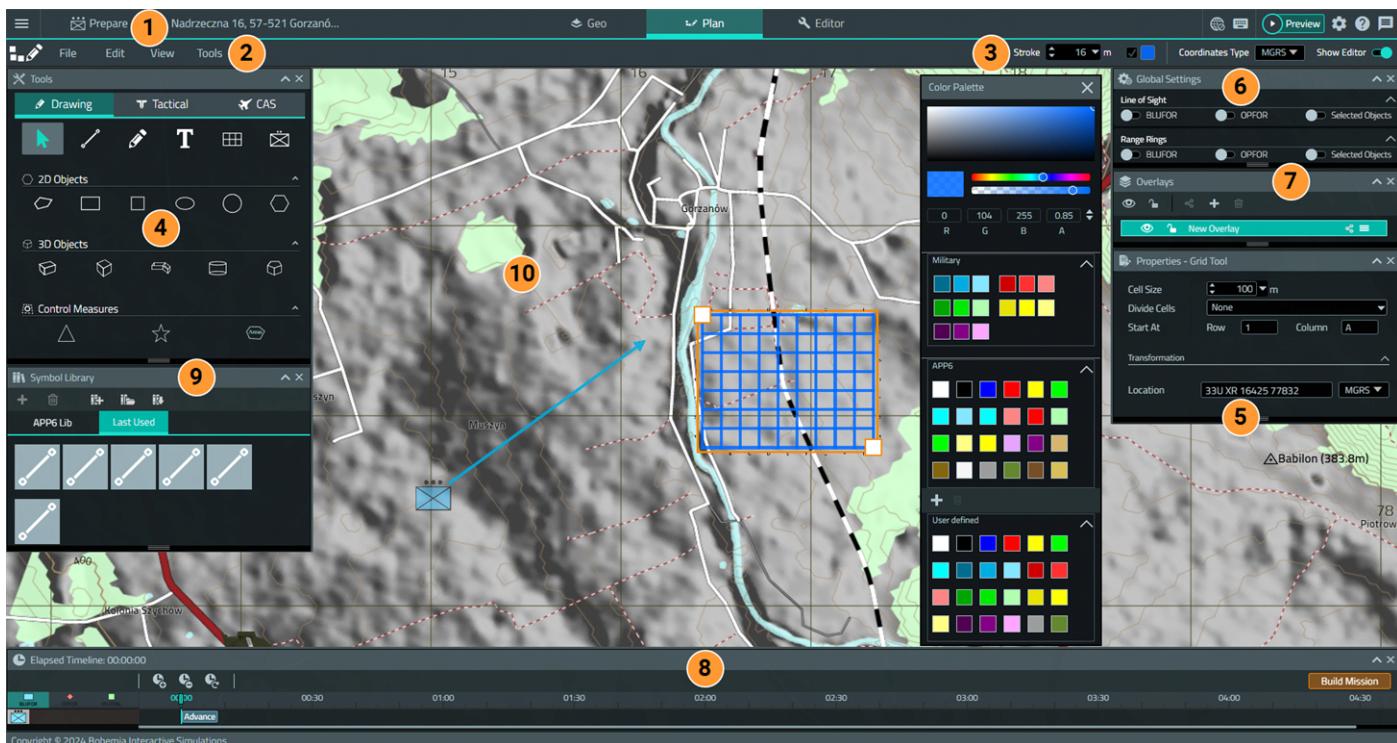
- Removing control points from Irregular 2D Shape objects (see [Irregular 2D Shape Tool \(on page 184\)](#)) can cause them to be invalid (grayed-out).

2. VBS Plan UI Overview

To access the VBS Plan UI, click the **Plan** icon in Prepare Mode, Execute Mode, or Assess Mode.



The VBS Plan UI contains the following components:



Number	Name	Description
1	VBS4 Toolbar (on page 20)	The Toolbar in Prepare Mode, provides access to the global Main Menu functions, Tool Selection switching to VBS Geo and VBS Plan, plus VBS4 Settings, Documentation, and Notifications.
2	Plan Menu (on page 20)	The Plan Menu provides access to specific VBS Plan functions.
3	Plan Toolbar (on page 22)	A toolbar that mainly includes the Global Properties (on page 238).

Number	Name	Description
4	Tools Panel (on page 23)	<p>A panel for selecting tools to create:</p> <ul style="list-style-type: none"> • Drawing Objects (on page 157) • Tactical Objects (on page 53) • CAS Objects (on page 103)
5	Properties Panels (on page 29)	<p>A set of panels that allow you to set the properties for the tools in the Tools Panel (on page 23), and the properties of the objects that get created by the tools.</p>
6	Global Settings (on page 30)	<p>The Global Settings include settings for the Line of Sight Tool (on page 35) and Range Rings (see Range Rings Settings (on page 30)).</p>
7	Overlays (on page 32)	<p>Options to manage overlays of Drawing Objects (on page 157), Tactical Objects (on page 53), and CAS Objects (on page 103).</p>
8	Timeline (on page 32)	<p>The VBS Plan tactical mission execution timeline.</p>
9	Symbol Library (on page 34)	<p>Allows you to store custom shapes / symbols that consist of Drawing Objects (on page 157), to create custom overlay objects.</p>
10	Mission Map (on page 34)	<p>The mission map is where you can place Drawing Objects (on page 157), Tactical Objects (on page 53), CAS Objects (on page 103), use View Controls (on page 35), and the Line of Sight Tool (on page 35).</p>

TIP

The VBS Plan panels have one or more of the following controls:

- You can resize the panels by dragging their borders.
- You can expand / collapse the panels and close them by clicking the **Expand / Collapse** and **Close Panel** icons (appearing from left to right in the panel header).



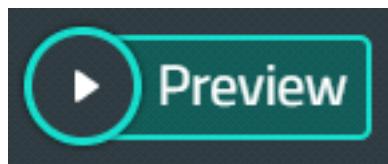
If you close any of the panels, select [Show All Panels \(on page 236\)](#) in the [View Menu Options \(on page 235\)](#) to view all the panels as they are displayed by default, when VBS Plan is opened.

2.1 VBS4 Toolbar

The Toolbar in Prepare Mode, provides access to the global Main Menu functions, Tool Selection switching to VBS Geo and VBS Plan, plus VBS4 Settings, Documentation, and Notifications.

For more information, see [VBS4 UI Overview](#) in the [Introduction to VBS4 Guide](#).

The Toolbar in Prepare Mode also displays the **Preview Button** to quickly run the Scenario in single-player mode.



For more information on how preview is used in VBS Plan, see [VBS Plan Workflow \(on page 14\)](#).

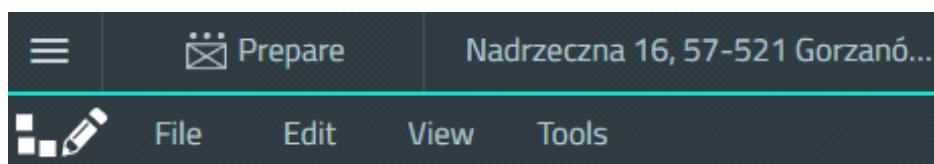
To exit VBS Plan, switch to one of the other VBS4 Tools, which are VBS Geo or VBS Editor.

For more information about the other VBS4 Tools, see:

- [VBS Geo Overview in the VBS Geo Manual](#)
- [VBS Editor Overview in the VBS4 Editor Manual](#)

2.2 Plan Menu

The Plan Menu provides the following options to Mission Designers during Scenario Preparation:



- [VBS4 Main Menu for Mission Planning \(below\)](#)
- [Plan Options \(on page 22\)](#)

2.2.1 VBS4 Main Menu for Mission Planning

In this release of VBS4, the following options are available under the VBS4 Main Menu (see the [Introduction to VBS4 Guide](#)).

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



Option	Description
Save	<p>Use this option to save the current Tactical Plan, which includes Drawing Objects (on page 157), Tactical Objects (on page 53), and CAS Objects (on page 103), as part of the Scenario.</p> <div style="border: 2px solid red; padding: 10px; margin-top: 10px;"><p> WARNING</p><p>This option saves the current state of the Tactical Plan in VBS Plan, the terrain Geo Project edits in VBS Geo, and the entities in the mission from VBS Editor.</p></div> <p>All Battlespace files are saved locally with an option to upload to a connected VBS World Server.</p> <p>For more information, see Battlespaces Folder in the Introduction to VBS4 Guide.</p>
Save As	<p>Use this option to save the current Tactical Plan, which includes Drawing Objects (on page 157), Tactical Objects (on page 53), and CAS Objects (on page 103), as part of the Scenario, as a new Battlespace or an overwritten version of the original Battlespace, based on the name you enter in the dialog.</p> <div style="border: 2px solid red; padding: 10px; margin-top: 10px;"><p> WARNING</p><p>This option saves the current state of the Tactical Plan in VBS Plan, the terrain Geo Project edits in VBS Geo, and the entities in the mission from VBS Editor.</p></div> <p>All Battlespace files are saved locally with an option to upload to a connected VBS World Server.</p> <p>For more information, see Battlespaces Folder in the Introduction to VBS4 Guide.</p>
Save and Upload	<p>Use this option to save the current VBS Plan edits as part of the Battlespace and upload it to the connected VBS World Server.</p> <div style="border: 2px solid red; padding: 10px; margin-top: 10px;"><p> WARNING</p><p>This option saves the current state of the Tactical Plan in VBS Plan, the terrain Geo Project edits in VBS Geo, and the entities in the mission from VBS Editor.</p></div> <p>All Battlespace files are saved locally and uploaded to a connected VBS World Server.</p> <p>For more information, see Battlespaces Folder in the Introduction to VBS4 Guide.</p> <div style="border: 2px solid #0070C0; padding: 10px; margin-top: 10px;"><p> NOTE</p><p>This option is only available if VBS4 is connected to VBS World Server, and only in Prepare mode.</p></div>
Close Prepare	<p>End Scenario Preparation and return to the main VBS4 UI in Battlespaces Mode. VBS Plan prompts you to Save and Close or Close Without Saving or Cancel.</p>

2.2.2 Plan Options

The VBS Plan options are divided into the following menus:

- **File** - Allows you to build a tactical mission, and import / export Tactical Plans, graphics, and overlays in various file formats. For more information, see the [File Menu Options \(on page 233\)](#).
- **Edit** - Allows you to edit VBS Plan overlays (for example, copying and pasting). For more information, see [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), [CAS Objects \(on page 103\)](#), and [Edit Menu Options \(on page 234\)](#).
- **View** - Allows you to control the visibility of various VBS Plan UI panels. For more information, see the [View Menu Options \(on page 235\)](#).
- **Tools** - Allows you to adjust weather parameters, and create / edit ORBATs using the ORBAT Editor. For more information, see Weather Settings and ORBAT Editor in the VBS4 Editor Manual.

2.3 Plan Toolbar

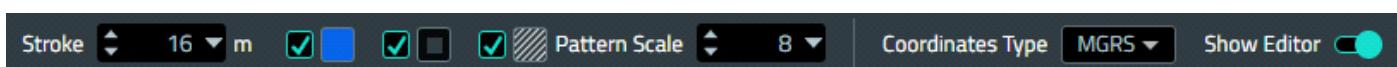
The toolbar contains the Global Properties, which are properties that are set for all the Drawing and some of the Tactical and CAS tools in the [Tools Panel \(on the next page\)](#).

NOTE

Only applicable options are displayed, based on the selected VBS Plan tool.

The toolbar also includes:

- The **Coordinates Type** drop-down, which sets the map-coordinates type:
 - MGRS
 - Lat/Long
 - LLMS
 - UTM
- The **Show Editor** toggle, which shows / hides the VBS Editor entities in VBS Plan.



For more information, see [Drawing Objects \(on page 157\)](#), [CAS Objects \(on page 103\)](#), and [Global Properties \(on page 238\)](#).

2.4 Tools Panel

The Tools Panel contains overlay objects, that include [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), and [CAS Objects \(on page 103\)](#). You can annotate the map using MIL-2525C military symbols, create text labels that appear at specific places on the map, create different geometric shapes, use freehand drawing, and create Tactical and CAS Unit Symbols that are converted to Tactical and CAS Units and Orders, when the mission runs.

The Tools Panel consists of three tabs:

- [Drawing Tab \(below\)](#)
- [Tactical Tab \(on page 25\)](#)
- [CAS Tab \(on page 27\)](#)



2.4.1 Drawing Tab

Drawing Objects have the following tools:

Drawing Tool	Icon	Description
Select Tool		Used to select overlay objects.
Line Tool		Used to draw straight lines. To use the tool, see Line Tool (on page 160) .
Freedraw Tool		Used for freehand drawing. To use the tool, see Freedraw Tool (on page 165) .

Drawing Tool	Icon	Description
Text Tool		Used to draw a user-specified text. To use the tool, see Text Tool (on page 168) .
Grid Tool		Used to draw a grid. To use the tool, see Grid Tool (on page 171) .
Unit Symbol Tool		Used to draw a MIL-2525C unit symbol. To use the tool, see Unit Symbol Tool (on page 175) .
2D Objects Tools		Used to draw any of the following 2D shapes: <ul style="list-style-type: none"> • Irregular 2D Shape • Rectangle • Square • Ellipse • Circle • Polygon Expand 2D Objects (expanded by default): To use the tools, see 2D Objects Tools (on page 179) .
3D Objects Tools		Used to draw any of the following 3D shapes: <ul style="list-style-type: none"> • Cuboid • Cube • Air Corridor • Cylinder • Prism Expand 3D Objects (expanded by default): To use the tool, see 3D Objects Tools (on page 189) .
Control Measures Tools		The following control measure drawings are available: <ul style="list-style-type: none"> • Assembly Area • Engagement Area • Friendly Area • Named Area of Interest • Target Area of Interest • Decision Point • Observation Post Expand Control Measures (expanded by default): For the Area control measures, see Area Tool (on page 195) . For Decision Point, see Decision Point Tool (on page 200) . For Observation Post, see Observation Post Tool (on page 204) .

2.4.2 Tactical Tab

Tactical Objects have the following tools:

General Tactical Tools

Tactical Tool	Icon	Description
Select Tool		Used to select overlay objects.
Units Tool		Used to create a Tactical MIL-2525C Units. To use the tool, see Units Tool (on page 57) .

Control Measure Tactical Tools



Expand **Control Measures** (expanded by default):

Tactical Tool	Icon	Description
Boundary Line Tool		Used to create tactical boundary line control measure. To use the tool, see Boundary Line Tool (on page 63) .
Phase Line Tool		Used to create a tactical phase line control measure. To use the tool, see Phase Line Tool (on page 67) .
Objective Tool		Used to create a tactical objective control measure. To use the tool, see Objective Tool (on page 71) .
Target Tool		Used to create a tactical artillery target control measure. To use the tool, see Target Tool (on page 76) .

Order Tactical Tools



Expand **Orders** (expanded by default):

⚠️ WARNING

If no Tactical Unit object is selected, the Order Tactical Tools are disabled. For information on how to create a Tactical Unit object, see the [Units Tool \(on page 57\)](#).

Tactical Tool	Icon	Description
Advance Order Tool		Used to create a tactical Advance Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Advance Order Tool (on page 80) .
Assault Order Tool		Used to create a tactical Assault Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Assault Order Tool (on page 84) .
Suppress Order Tool		Used to create a tactical Suppress Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Suppress Order Tool (on page 88) .
Fire Mission Order Tool		Used to create a tactical Fire Mission Order for an artillery Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Fire Mission Order Tool (on page 92) .
Defend Order Tool		Used to create a tactical Defend Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Defend Order Tool (on page 97) .

2.4.3 CAS Tab

CAS Objects have the following tools:

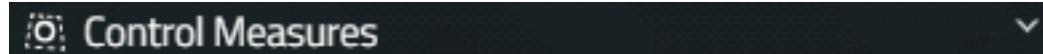
★ FEATURE NOTICE

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General CAS Tools

CAS Tool	Icon	Description
Select		Used to select overlay objects.
CAS Units		<p>Used to create CAS MIL-2525C Units.</p> <p>To use the tool, see CAS Units Tool (on page 108).</p> <p>To customize the CAS aircraft and munitions parameters, see CAS Unit Parameters (on page 113).</p>

Control Measure CAS Tools



Expand **Control Measures** (expanded by default):

CAS Tool	Icon	Description
Control Point (CP)		<p>Use the Control Point (CP) Tool for fixed-wing aircraft to:</p> <ul style="list-style-type: none"> Define Holding Areas (HAs). Define egress points. Check-in with designated JTAC. Maneuver prior to moving to the Initial Point (IP) (see CAS Initial Point (IP) Tool (on page 128)). <p>To use the tool, see CAS Control Point (CP) Tool (on page 125).</p>
Initial Point (IP)		<p>Used by fixed-wing aircraft as the starting point for maneuvering to the target.</p> <p>To use the tool, see CAS Initial Point (IP) Tool (on page 128).</p>

CAS Tool	Icon	Description
Holding Area (HA)		Used by rotary-wing aircraft check-ins and CAS briefing prior to moving to the Battle Position (BP). To use the tool, see CAS Holding Area (HA) Tool (on page 131) .
Battle Position (BP)		Used by rotary-wing aircraft to define the point where attacks on the target commence. To use the tool, see CAS Battle Position (BP) Tool (on page 134) .
No Fly Zone (NFZ)		Used to specify where aircraft flight is restricted. To use the tool, see CAS No Fly Zone (NFZ) Tool (on page 137) .
No Fire Area (NFA)		Used to specify where aircraft cannot fire munitions. To use the tool, see CAS No Fire Area (NFA) Tool (on page 142) .

Available Aircraft CAS Tool

The screenshot shows a table titled "Available Aircraft" with the following data:

Name	Status	Controls
A-10A	N/A	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-1	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-2	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-3	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-4	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C	N/A	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-1	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-2	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-3	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-4	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>

Expand **Available Aircraft** (expanded by default). The tool allows you to:

- Observe CAS aircraft status at CAS mission runtime.
- Control individual CAS aircraft at CAS mission runtime using Cleared Hot (CH) / Abort functions.
- Show / hide CAS aircraft splines (trajectories) and REDs (Risk-Estimate Distances).

For more information, see [CAS Available Aircraft Tool \(on page 123\)](#).

CAS Order Tools

The screenshot shows a table titled "Orders" with the following data:

Order Type	Order ID	Target	Status	Action
Attack	Order 1	Target A	Pending	<input type="button" value="Assign"/>
Attack	Order 2	Target B	Pending	<input type="button" value="Assign"/>
Attack	Order 3	Target C	Pending	<input type="button" value="Assign"/>
Attack	Order 4	Target D	Pending	<input type="button" value="Assign"/>
Attack	Order 5	Target E	Pending	<input type="button" value="Assign"/>
Attack	Order 6	Target F	Pending	<input type="button" value="Assign"/>
Attack	Order 7	Target G	Pending	<input type="button" value="Assign"/>
Attack	Order 8	Target H	Pending	<input type="button" value="Assign"/>
Attack	Order 9	Target I	Pending	<input type="button" value="Assign"/>
Attack	Order 10	Target J	Pending	<input type="button" value="Assign"/>

Expand **Orders** (expanded by default):

⚠️ WARNING

If no CAS Unit object is selected, the CAS Order Tools are disabled. For information on how to create a CAS Unit object, see the [CAS Units Tool \(on page 108\)](#).

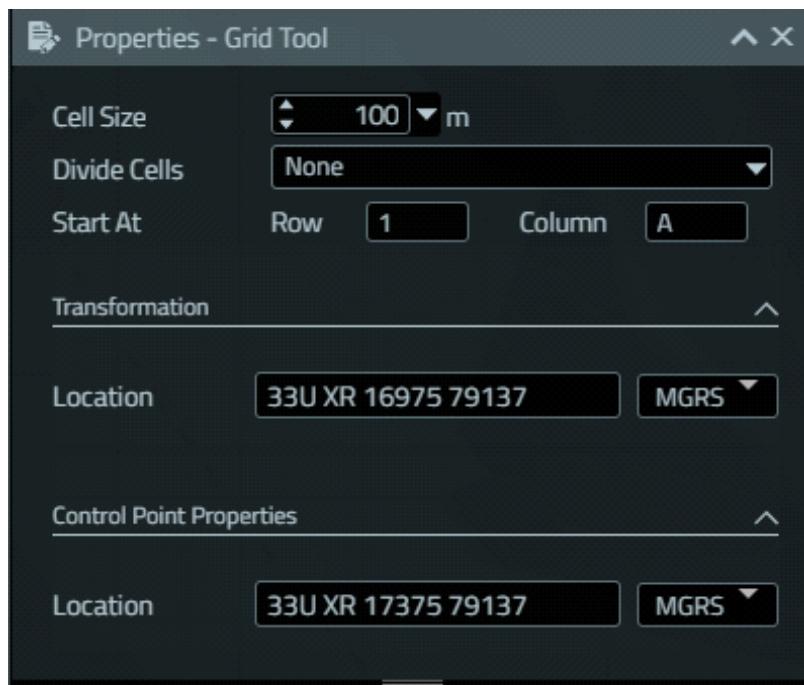
CAS Tool	Icon	Description
CAS Mission Order		Used to create a CAS Mission Order for a CAS Unit object (see CAS Units Tool (on page 108)). To use the tool, see CAS Mission Order Tool (on page 147) .

ℹ️ NOTE

When CAS Mission Orders execute, the [CAS Mission List Panel \(on page 38\)](#) and [CAS Event List Panel \(on page 39\)](#) populate with CAS mission- and event-related information.

2.5 Properties Panels

The Properties Panels allow you set the [Specific Properties \(on page 240\)](#) for the tools in the [Tools Panel \(on page 23\)](#), and the properties of the objects that get created by the tools.

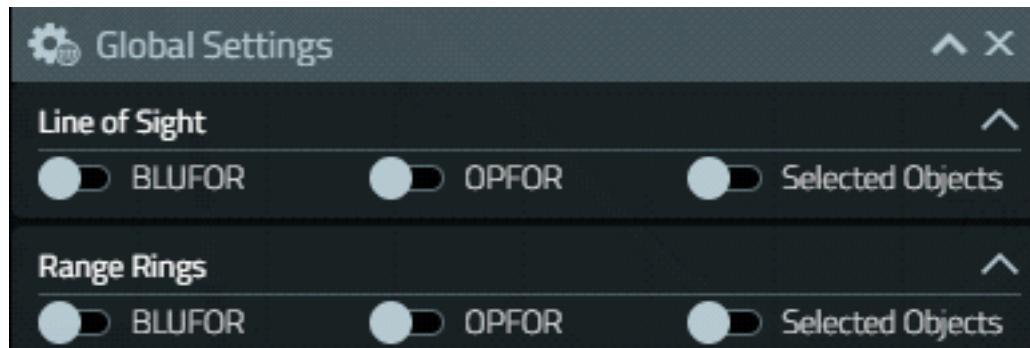


2.6 Global Settings

The Global Settings include settings for the [Line of Sight Tool \(on page 35\)](#) and Range Rings, which are circular markings that designate the maximum engagement radius for Tactical Units (the radius varies for infantry and vehicles).

NOTE

The Global Settings are only available in Prepare Mode.



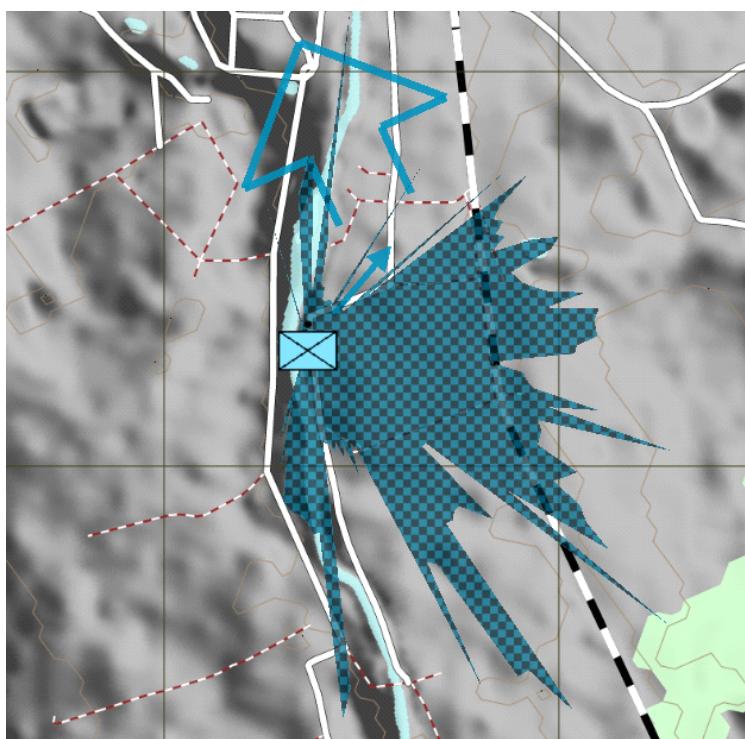
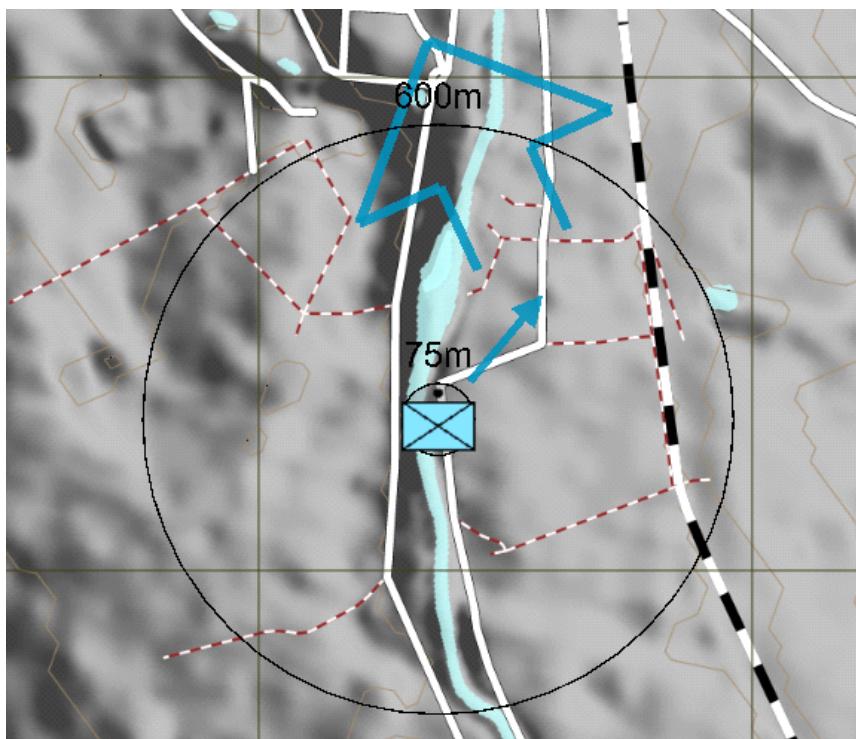
Line of Sight Settings

Setting	Description
BLUFOR	Toggle to show / hide the Line of Sight for all BLUFOR Tactical Units.
OPFOR	Toggle to show / hide the Line of Sight for all OPFOR Tactical Units.
Selected Objects	Toggle to show / hide the Line of Sight for the selected objects (BLUFOR and / or OPFOR Tactical Units).

For Line of Sight visualization at any given point on the map, see [Line of Sight Tool \(on page 35\)](#).

Range Rings Settings

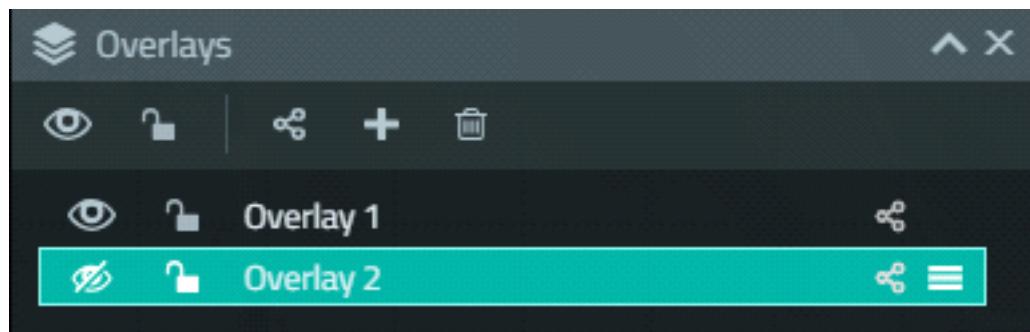
Setting	Description
BLUFOR	Toggle to show / hide the Range Rings for all BLUFOR Tactical Units.
OPFOR	Toggle to show / hide the Range Rings for all OPFOR Tactical Units.
Selected Objects	Toggle to show / hide the Range Rings for the selected objects (BLUFOR and / or OPFOR Tactical Units).

Image-2: Line of Sight BLUFOR toggle on**Image-3: Range Rings BLUFOR toggle on**

2.7 Overlays

Options to manage overlays of Drawing Objects (on page 157), Tactical Objects (on page 53), and CAS Objects (on page 103). For more information, see Managing Overlays (on page 211).

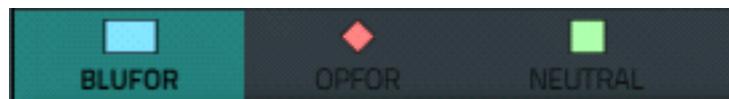
Image-4: Overlays panel



2.8 Timeline

The timeline for the VBS Plan tactical mission execution includes the following items:

Timeline Legend - The mission timeline legend, consisting of BLUFOR, OPFOR, and Neutral Tactical Units.



These legend icons appear in the timeline to indicate a unit-specific event.

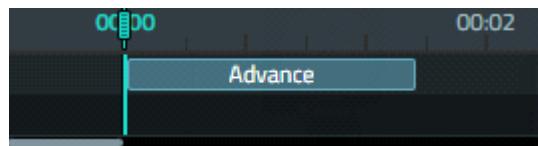
Timeline Density Controls - The timeline density controls allow you to zoom in, zoom out, and reset to the default timeline density level.

Image-5: Left to right: zoom in, out, reset



Other Timeline Controls - In addition to the **Timeline Density Controls**, you can also change the start and end time of Orders to execute, by dragging the Order time box left (to start the order earlier) and right (to start the Order later) in the timeline.

Image-6: Advance Order time box

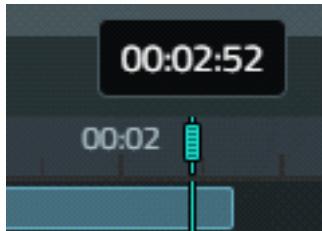


NOTE

For Defend, Fire Mission, and Suppress Orders (see [Defend Order Tool \(on page 97\)](#), [Fire Mission Order Tool \(on page 92\)](#), and [Suppress Order Tool \(on page 88\)](#)), you can also shorten / lengthen the duration of the Order execution by dragging the start and end arrows of the Order in the timeline.



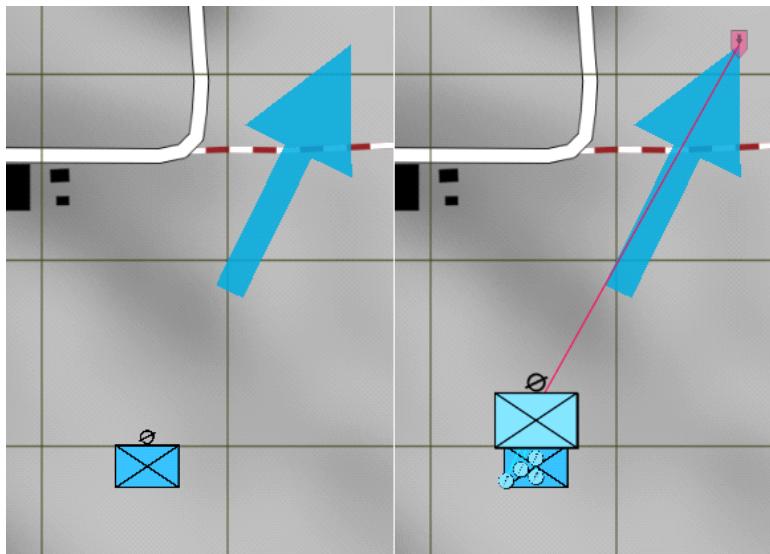
The blue **Timeline Scrubber** allows you to jump to a specific mission time.



Build Mission - The Build Mission button builds the tactical mission and runs it.

NOTE

You can only build a mission in **Prepare Mode**.

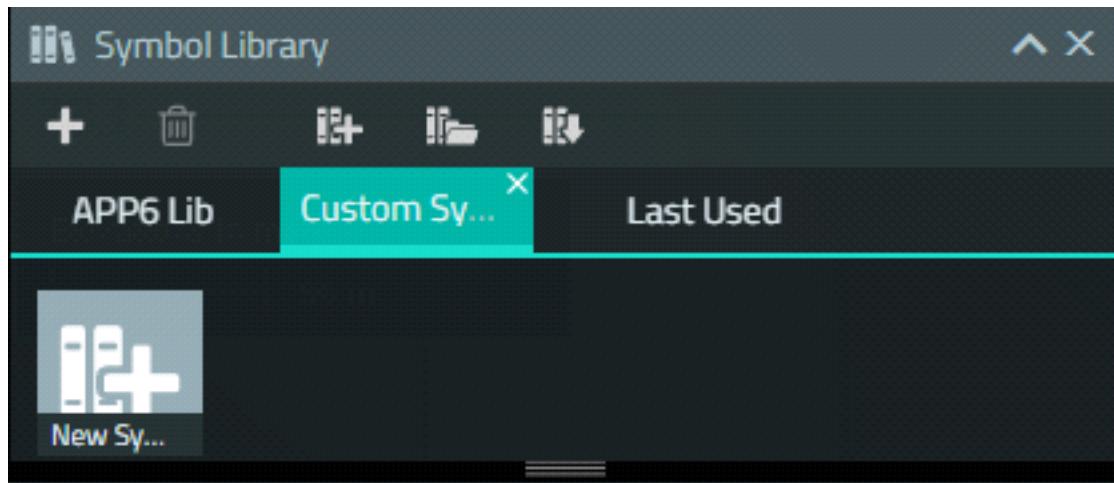
Build Mission

Alternatively, use **File > Build Mission**.

2.9 Symbol Library

The [Symbol Library \(on page 208\)](#) allows you to store custom shapes / symbols that consist of [Drawing Objects \(on page 157\)](#), to create custom overlay objects.

Image-7: Symbol Library panel



2.10 Mission Map

The mission map is where you can:

- Place [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), and [CAS Objects \(on page 103\)](#).
- Use [View Controls \(on the next page\)](#).
- Use the [Line of Sight Tool \(on the next page\)](#).

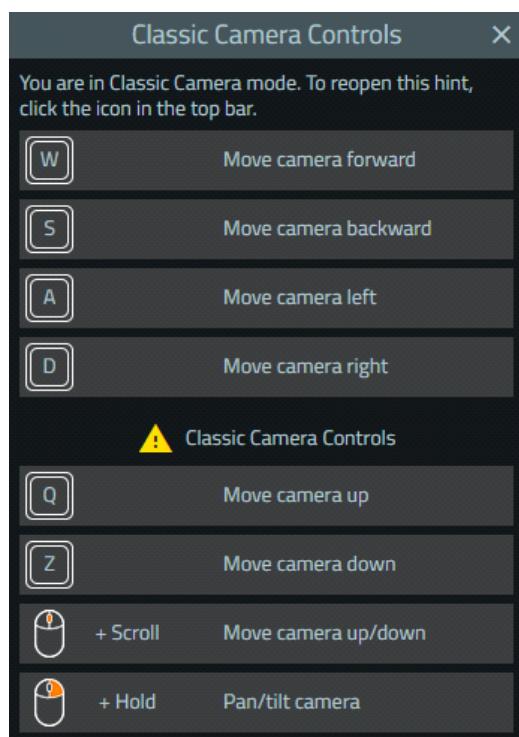
2.10.1 View Controls

Mission Designers can navigate the scenario in both 2D and 3D View. Use the views to place new [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), and [CAS Objects \(on page 103\)](#), to modify them, and to interact with them.

The following view controls are available:

- To switch between views, press **Map (M)**.
- In any view, right-click a position on the 2D map / 3D terrain, and select **Default Camera** to open the 3D camera view in the selected position.

Use any of the following 3D View Classic Camera Controls:



2.10.2 Line of Sight Tool

The Line of Sight tool can be used in the 2D / 3D View, before placing Tactical Units at a given location on the map.

NOTE

Unlike the [Line of Sight Settings \(on page 30\)](#), the Line of Sight Tool is available in Prepare / Preview / Execute Mode.

Do any of the following:

- For global Line of Sight visualizations, see [Line of Sight Settings \(on page 30\)](#).
- To show the Line of Sight, right-click a position on the map and select **Show Line of Sight**.
An area around the position, from which there is a clear Line of Sight, is highlighted.
- To display the non-visible area of a selected map position, right-click the map position and select **Invert Line of Sight Display**.
A non-visible area around the position is highlighted.
- To clear the highlighted Line of Sight area, right-click any position on the map and select **Clear Line of Sight**.
All Line of Sight area highlighting is cleared.

Image-8: Line of Sight in the 2D View

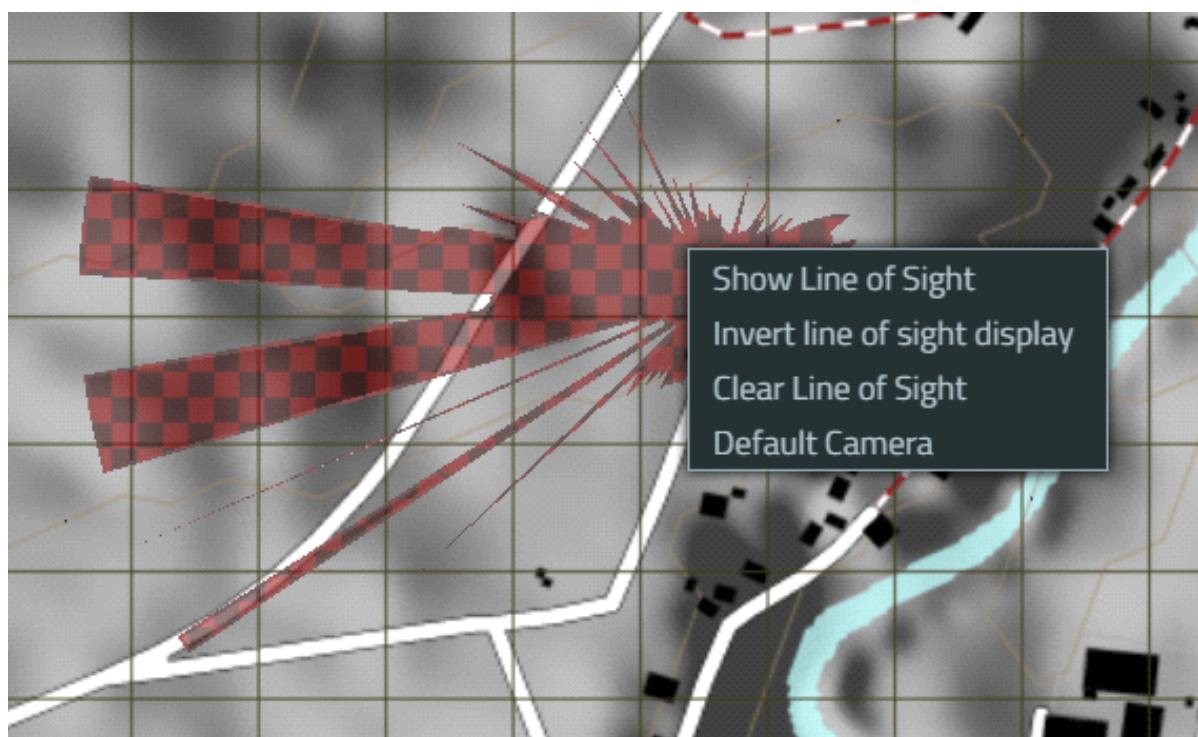
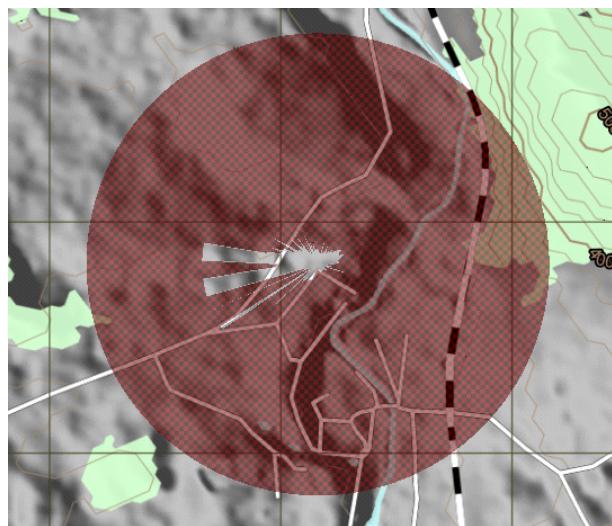


Image-9: Line of Sight in the 3D View**Image-10: Non-visible area in 2D****Image-11: Non-visible area in 3D**

2.11 CAS Mission List Panel

The Mission List panel shows a list of mission statuses based on the missions that CAS Units (see [CAS Units Tool \(on page 108\)](#)) execute during the CAS scenario.

Name	Status	Start Time	End Time
A-10A	On Mission	0:04:32	0:06:45

The Mission List information depends on the VBS4 Mode:

- **Preview / Execute Mode** - CAS mission statuses are added to the Mission List as the CAS scenario executes.
- **Assess Mode** - All the CAS mission statuses that occur during the CAS scenario run are in the Mission List when the After Action Review (AAR) loads. For more information, see [VBS Close Air Support \(CAS\) in AAR \(on page 231\)](#).

The CAS mission statuses are:

NOTE

Other aircraft statuses are displayed in the Available Aircraft Panel (see [CAS Available Aircraft Tool](#)).

Mission Status	Description
On Hold	Shows when all or individual aircraft are in a Holding Pattern (HP) either from routing or after egressing.
On Mission	Shows when one or more aircraft are conducting a CAS mission but have different individual statuses.
On Route	Shows when one or more aircraft are egressing.

2.12 CAS Event List Panel

The Event List panel shows a list of CAS events that occur during the CAS mission.

Type	Description	Designation	Time
✓	Mission created	A-10A-1	0:04:32
✓	Egressing	A-10A-1	0:09:26
✓	Off Dry	A-10A-1	0:09:26
⚠	No Cleared Hot Given	A-10A-1	0:09:26
⚠	Not Able to Fire	A-10A-1	0:09:26

The Event List information depends on the VBS4 Mode:

- **Preview / Execute Mode** - CAS events are added to the Event List as the CAS mission executes.
- **Assess Mode** - All the CAS events that occur during the CAS mission run are in the Event List when the After Action Review (AAR) loads. For more information, see [VBS Close Air Support \(CAS\) in AAR \(on page 231\)](#).

The following is discussed:

- [Event List Information \(below\)](#)
- [Possible Events \(on the next page\)](#)

2.12.1 Event List Information

The Event List information is divided into several columns:

Column	Description
Type	Event type. For more information, see Event Type (on the next page) .
Description	Event description. For more information, see Event Description (on the next page) .

Column	Description
Designation	Aircraft name / callsign.
Time	Event time.

2.12.2 Possible Events

The possible CAS event types are:

Event Type	Icon	Event Description
Abort		CAS mission aborted. For more information, see CAS Mission Order Tool (on page 147) .
Cleared Hot		When an aircraft is ordered a Cleared Hot before weapon release. For more information on Cleared Hot, see CAS Available Aircraft Tool (on page 123) and CAS Mission Order Tool (on page 147) .
Egressing		Shows after an aircraft fires the last munition.
Laser Off		Aircraft reports it has fired a PRF-guided munition 10s ago.
Laser On		Aircraft reports it is about to fire a PRF-guided munition in 30s.
Mission Created		CAS mission created. For more information, see CAS Mission Order Tool (on page 147) .
Munition Impact		Single shot munition impacts.

NOTE

If the munition quantity (**Munitions > Quantity** property - see [CAS Mission Order Tool \(on page 147\)](#)) is bigger than 1, whether the event only appears for the first munition impact or for all is determined by the `logAllImpacts` JSON parameter (see [CAS Unit Parameters \(on page 113\)](#)).

Event Type	Icon	Event Description
Munition Release		Aircraft releases a single shot munition. <div style="border: 1px solid #0070C0; padding: 10px;"> <p>NOTE</p> <p>If the munition quantity (Munitions > Quantity property - see CAS Mission Order Tool (on page 147)) is bigger than 1, the event appears for every munition release.</p> </div>
No Ammo		Aircraft runs out of shots of the currently selected munition.
No Cleared Hot Given		Aircraft is unable to fire because of delayed Cleared Hot. For more information on Cleared Hot, see CAS Available Aircraft Tool (on page 123) and CAS Mission Order Tool (on page 147) .
No Fire Area Violation		Aircraft fires munitions in a No Fire Area (NFA). For more information, see CAS No Fire Area (NFA) Tool (on page 142) . <div style="border: 1px solid #0070C0; padding: 10px;"> <p>NOTE</p> <p>If the munition quantity (Munitions > Quantity property - see CAS Mission Order Tool (on page 147)) is bigger than 1, the event appears for every munition release.</p> </div>
No Fly Zone Violation		Aircraft enters a No Fly Zone (NFZ). For more information, see CAS No Fly Zone (NFZ) Tool (on page 137) .
Not Able to Fire		Aircraft is unable to fire because of invalid CAS Mission Order parameters. For more information, see CAS Mission Order Tool (on page 147) .
Off Dry		Aircraft reports it starts egressing and that no munitions were released.
Off Hot		Aircraft reports it starts egressing and that munitions were released.
Return to Base		Aircraft returns to base.
Time of Flight		Time of flight of unguided / GPS-guided munitions. Shown in brackets in seconds.

2.13 Forms

VBS4 enables scenario designers to create customizable forms that can be used as required. In addition, there is a range of existing forms provided for use by Administrators / Instructors and Trainees. All scenario participants can view a list of completed forms, once they are sent / transmitted.

This topic discusses the following:

- [Accessing Form Options \(below\)](#)
- [Creating a Form \(on the next page\)](#)
- [Filling-In and Sending a Form \(on page 45\)](#)
- [Existing Form Types \(on page 46\)](#)
- [Completed Forms \(on page 50\)](#)

2.13.1 Accessing Form Options

Form options are accessed from the following locations:

- Under the Tools Menu Options in the VBS Editor in Prepare, Execute, and C2 Modes (see Tools Menu Options in the VBS4 Instructor Manual).
- In the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual) in Execute and C2 Modes.

Option	Mode	Location	Description
Send Form	Execute / C2	Tools Menu / Quick Menu	Opens the Send Form dialog, where you can select the type of form you want to send, and the recipients. For more information, see Filling-In and Sending a Form (on page 45) .
Create Form	Prepare / Execute	Tools Menu	Opens the Form dialog, where you can create customized form templates. For more information, see Creating a Form (on the next page) .
List Forms	Execute / C2	Tools Menu	Opens the List Forms dialog, which lists all Completed Forms (on page 50) .

2.13.2 Creating a Form

Select **Create Form** from the Tools Menu to create a new form template.

Follow these steps:

1. Go to **Tools > Create Form**.

The Form dialog opens.



2. Use the first drop-down to select the type of row on the form that you want to create:

Type	Description	Label	Value
Text	Text only, no fields to fill-in.	Row item name.	Item value, which cannot be edited.
		Use the drop-down to select the number of rows for the item value. If there is more than one value, they are placed side-by-side in the same row.	
Edit	Text with a field to fill-in.	Row item name.	Item value, which can be edited.
		Use the drop-down to select the number of rows for the item value. The value is placed in a box, which can be edited by the user. If there is more than one value, they are placed side-by-side the box.	
Combo	Text with a drop-down menu.	Row item name.	Item value, which cannot be edited. Multiple values can be added by separating them with a comma (,). Value 1, Value 2, Value 3
		Use the drop-down to select the number of rows for the item value. If 1 row is selected, the items in the Value field are placed in a drop-down menu. If more than 1 row is selected, the values are placed in a list.	

3. Do one of the following:

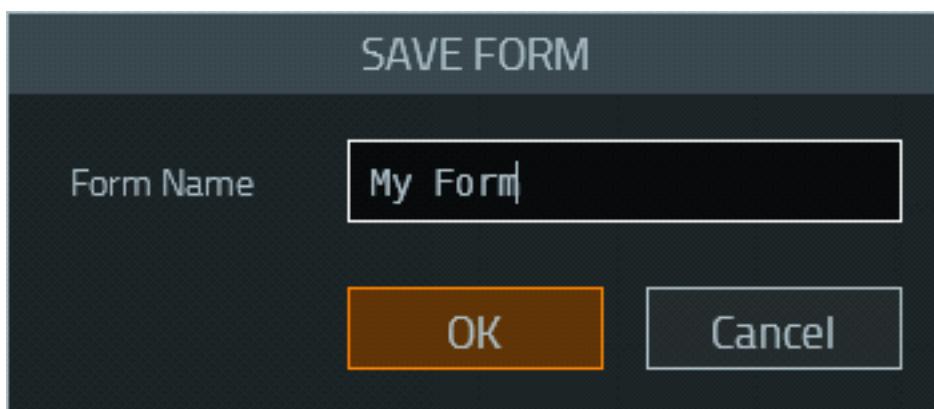
- Click **Preview** to see how the form looks (click **X** to return to the Form dialog to continue creating your form).
- Click **Add**, to add more rows.
- Click **Clear** to clear the row and start again.

4. If necessary, click the **arrow icons** to move the rows up or down on the form, or click the **trash icon** to reset the row.



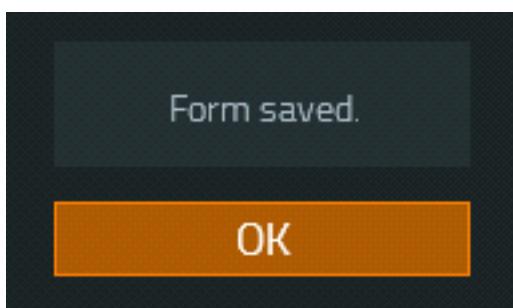
5. Click **Save** to save the form.

The Save Form dialog opens.



Input a name for the form, and click **OK**.

The Form Saved dialog opens.



Click **OK**. The form is created, and saved in the profile data (it is mission independent).

6. Once the form is loaded / saved, click **Transfer** to send the created form across the network.

2.13.3 Filling-In and Sending a Form

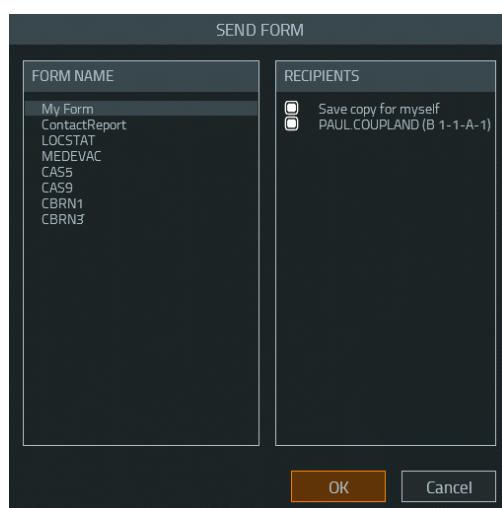
Once other computers receive the form templates, they are available in the **Form Name** list of the **Send Form** dialog, along with the [Existing Form Types](#) (on the next page).

Follow these steps:

1. Do one of the following to send a form:

- Go to **Tools > Send Form**.
- Open the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual) and click **COMMS**, then click **FORMS**.

The **Send Form** dialog opens.



2. Select a form to send in the **Form Name** list so that it is highlighted.
3. If you are in a multiplayer scenario, select the **Recipients** you want to send the form to.

NOTE

By default, all Administrators / Instructors are selected, as is **Save copy for myself**. If you change the selection, the list of recipients is used for all forms for the remainder of the scenario, or until the selection is updated.

4. Click **OK**.

The selected form opens.

5. Fill-in the form, and click **Send / Transmit / OK** to send it.

The form is sent.

NOTE

Dedicated servers always receive the forms.

2.13.4 Existing Form Types

This section lists the existing form types, that are provided by default, and describes their uses. The procedure to access and send them is described in [Filling-In and Sending a Form \(on the previous page\)](#).

ContactReport

Use this form to report the detection of an enemy.

The screenshot shows a dark-themed window titled "CONTACTREPORT". It contains several input fields:

- A large empty text input field.
- An empty text input field below it.
- A text input field containing "31TFF2814726245".
- A text input field containing "Unknown".
- A text input field containing "12:00:11".
- An empty text input field below the timestamp.
- A section labeled "ENEMY SHOTS" with an empty text input field containing "0".
- A section labeled "FRIENDLY SHOTS" with an empty text input field containing "0".

LOCSTAT

Use this form to send your "Location State". Your coordinates are included by default.

The screenshot shows a dark-themed window titled "LOCSTAT". It contains three input fields:

- A text input field containing "B".
- An empty text input field below it.
- An empty text input field below the second one.

MEDEVAC

Use this form to request medical assistance.

The screenshot shows a dark-themed window titled "MEDEVAC". It contains several input fields:

- A text input field containing "33UXR1715378935".
- A section labeled "ENEMY HITS" with an empty text input field containing "0".
- A section labeled "ENEMY WOUNDS" with an empty text input field containing "0".
- A section labeled "FRIEND HITS" with an empty text input field containing "0".
- A section labeled "FRIEND WOUNDS" with an empty text input field containing "0".

The MEDEVAC form accessed here is a simplified version of the MEDEVAC form accessed from the new User Actions. For more information, see MEDEVAC / CASEVAC in the VBS4 Editor Manual and Request MEDEVAC / CASEVAC.

CAS 5-Line / CAS 9-Line

Use these forms to request Close Air Support (CAS) (see VBS Close Air Support).

CAS 5-line form

Line 1	A/C Callsign _____, this is _____, 5-line
	Type <input type="button" value="1"/> <input type="button" value="BOC"/> Ordinance _____
Line 2	My position _____, Marked by _____
Line 3	Target location _____
	Range _____, Bearing _____
Line 4	Target description _____, Marked by _____
Line 5	FAH _____ LTL _____ SEAD <input type="button" value="Int"/>
	ACA _____ Danger Close <input type="checkbox"/> GFC Init _____
Remarks/ Restrictions	_____

Send **Close**

CAS 9-line form

Line 1	IP/BP _____
Line 2	Heading _____ / Offset _____
Line 3	Distance _____
Line 4	Target elevation _____
Line 5	Target description _____
Line 6	Target location _____
Line 7	Type mark _____ Code _____
Line 8	Location of friendlies _____
Line 9	Egress _____
Remarks/ Restrictions	FAH _____ LTL/PTL _____ TOT _____ / TTT _____ _____

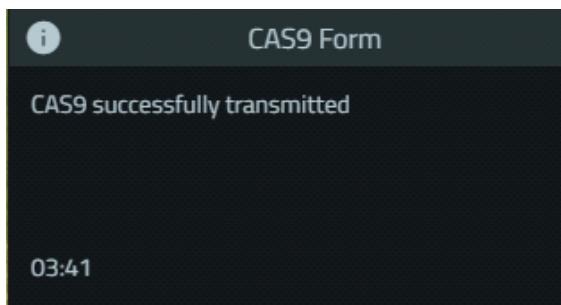
Send **Close**

For more information, see VBS Close Air Support Execution and VBS Close Air Support Example Execution in the VBS Close Air Support Manual.

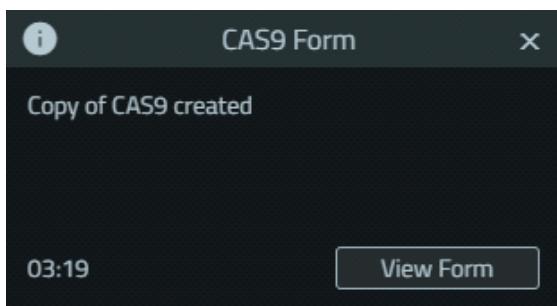
When you click **Send**, the following dialogs appear at the bottom-right of your screen, and in your **Notifications** panel.

NOTE

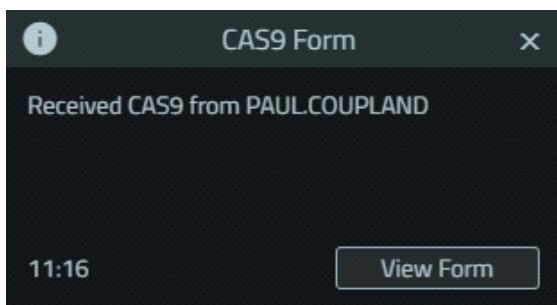
The dialogs appear in first-person view, in the VBS Editor, and in the VBS Plan / CAS UI. Dialogs that appear in first-person view cannot be interacted with.



If you selected **Save copy for yourself**, the following dialog appears. Click **View Form** to open and view the form.



If you receive a **CAS 5-Line** or **CAS 9-Line** form, the following dialog appears. Click **View Form** to open and view the form.

**TIP**

Received CAS 5-Line or CAS 9-Line forms have the informational text **Select desired text for copy and paste**. at the bottom. This means that you can copy information from the form and paste it elsewhere. For example, you may need to copy and paste target coordinates when creating a new target in the VBS Plan / CAS UI.

CBRN1 / CBRN3

Use the CBRN1 Form to send an initial report of CBRN observations. Use the CBRN3 form to send an immediate warning of CBRN contamination, or a Hazardous Area (see Hazardous Area in the VBS4 Editor Manual).

Line	Nuclear	Chemical	Biological	Radiological
A	C	C	C	C
B	M	M	M	M
D	M	M	M	M
F	O	O	O	O
G	M	M	M	M
H	M	N/A	N/A	N/A



TIP

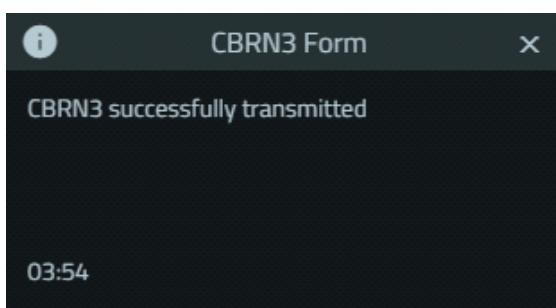
Cells marked with an **M** are mandatory. Cells marked with an **O** are optional.

When you click **Send**, the following dialogs appear at the bottom-right of your screen, and in your **Notifications** panel.

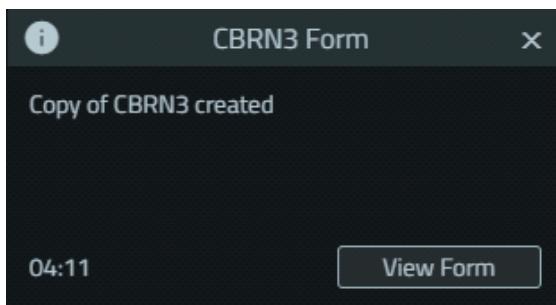


NOTE

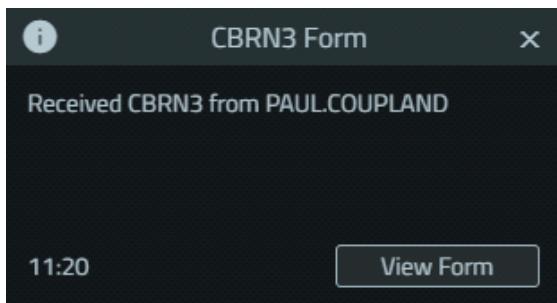
The dialogs appear in first-person view, in the VBS Editor, and in the VBS Plan / CAS UI. Dialogs that appear in first-person view cannot be interacted with.



If you selected **Save copy for yourself**, the following dialog appears. Click **View Form** to open and view the form.



If you receive a **CBRN1** or **CBRN3** form, the following dialog appears. Click **View Form** to open and view the form.



2.13.5 Completed Forms

Completed forms are forms that have been transmitted / sent.

Follow these steps:

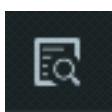
1. Go to **Tools > List Forms** to access the current list of completed forms.

The **List Forms** dialog opens.

MISSION:	All	START TIME:	All	X	
Form Title	Mission	Submitted By	Side	Scenario Start	Sim Time
CBRN1	Poland	PAUL.COUPALND	BLUFOR	13-2-2023 16h 39m	00:03:52
LOCSTAT	Poland	PAUL.COUPALND	BLUFOR	14-2-2023 16h 28m	00:00:16

2. Do one of the following:

- Double-click an **entry** in the list to open and view the form.
- Click an **entry** in the list, so that it is highlighted, and click the search icon.



The form opens for you to view.

3. Click **X** to close the form.



TIP

Sent CAS 5-Line / 9-Line forms and CBRN1 / CBRN3 forms can also be opened and viewed by the receiver by clicking **View Form** in their notification dialogs. For more information, see [CAS 5-Line / CAS 9-Line \(on page 47\)](#) and [CBRN1 / CBRN3 \(on the previous page\)](#).

The following applies to all completed forms:

- The server receives and stores all completed forms.
- Trainees can see all the forms they have transmitted (filtering by **Mission / Start Time** is possible).
- The Administrator / Instructor can see all the forms sent by all users.
- If an After Action Review (AAR) was recorded, bookmarks appear in the Timeline and the Bookmarks List to indicate that a form was sent. Double-clicking an entry in the Bookmarks List brings up the form, and moves the current time in the Timeline to when the form was sent. For more information, see After Action Review (AAR) and Bookmarks List in the VBS4 AAR Manual.

3. Import Content

You can import the following content into VBS Plan:

- [VBS Plan Drawings \(below\)](#)

To export content, see [Export Content \(on page 218\)](#).

3.1 VBS Plan Drawings

You can import VBS Plan Drawings ([.ckbo](#) files).

 **NOTE**

VBS Plan Drawings are only visible in scenarios with the same geographic location.

Follow these steps:

1. Open **File > Import > Plan Overlays**.
2. Browse to the VBS Plan Drawing ([.ckbo](#)) file location, and click **Open**.

The VBS Plan Drawings are imported.

4. Tactical Objects

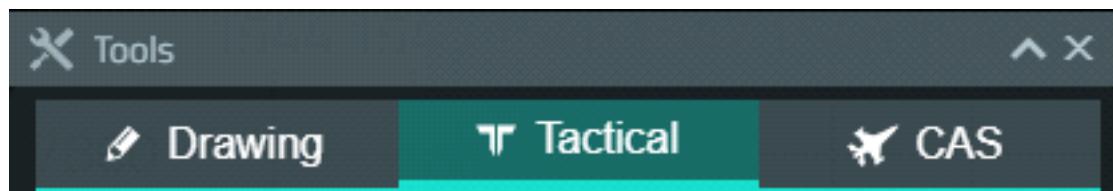
The VBS Plan UI provides a set of Tactical Tools to create Tactical Objects, to build a mission, and execute it.

The Tactical Objects appear in:

- VBS Plan (Prepare / Execute Mode)
- VBS Editor (Prepare / Execute Mode)
- C2 (Execute Mode)
- AAR (Assess Mode)

Like [Drawing Objects \(on page 157\)](#), you can place Tactical Objects in overlays and manage them (see [Managing Overlays \(on page 211\)](#)).

In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.



Select the Tactical tool you want to use:

General Tactical Tools

Tactical Tool	Icon	Description
Select Tool		Used to select overlay objects.
Units Tool		Used to create a Tactical MIL-2525C Units. To use the tool, see Units Tool (on page 57) .

Control Measure Tactical Tools



Expand **Control Measures** (expanded by default):

Tactical Tool	Icon	Description
Boundary Line Tool		Used to create tactical boundary line control measure. To use the tool, see Boundary Line Tool (on page 63) .
Phase Line Tool		Used to create a tactical phase line control measure. To use the tool, see Phase Line Tool (on page 67) .
Objective Tool		Used to create a tactical objective control measure. To use the tool, see Objective Tool (on page 71) .
Target Tool		Used to create a tactical artillery target control measure. To use the tool, see Target Tool (on page 76) .

Order Tactical Tools



Expand **Orders** (expanded by default):

WARNING

If no Tactical Unit object is selected, the Order Tactical Tools are disabled. For information on how to create a Tactical Unit object, see the [Units Tool \(on page 57\)](#).

Tactical Tool	Icon	Description
Advance Order Tool		Used to create a tactical Advance Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Advance Order Tool (on page 80) .
Assault Order Tool		Used to create a tactical Assault Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Assault Order Tool (on page 84) .
Suppress Order Tool		Used to create a tactical Suppress Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Suppress Order Tool (on page 88) .

Tactical Tool	Icon	Description
Fire Mission Order Tool		Used to create a tactical Fire Mission Order for an artillery Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Fire Mission Order Tool (on page 92) .
Defend Order Tool		Used to create a tactical Defend Order for a Tactical Unit object (see Units Tool (on page 57)). To use the tool, see Defend Order Tool (on page 97) .

Follow these steps:

1. Make sure that the [Specific Properties \(on page 240\)](#) of the selected tool are set.
2. Create an object using the tool.

NOTE

The object is added to the selected overlay. For more information, see the [Managing Overlays \(on page 211\)](#).

3. If necessary, modify the existing object size / shape / location and [Specific Properties \(on page 240\)](#).

TIP

Some tools enable you to delete control points to modify the shape of an object.



The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

4. Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo object modification actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

NOTE

The bounding box does not exactly update its size to encapsulate objects when undo / redo is used. This does not affect functionality.

5. If you create Tactical Units (see [Units Tool \(on the next page\)](#)), you can give them Tactical Orders (see [Advance Order Tool \(on page 80\)](#), [Assault Order Tool \(on page 84\)](#), [Suppress Order Tool \(on page 88\)](#), [Fire Mission Order Tool \(on page 92\)](#), [Defend Order Tool \(on page 97\)](#)) and Control Measures (see [Boundary Line Tool \(on page 63\)](#), [Phase Line Tool \(on page 67\)](#), [Objective Tool \(on page 71\)](#), [Target Tool \(on page 76\)](#)).

6. Review the Tactical Plan that you created, using Tactical Objects.

For more information, see [Review Plans \(on page 219\)](#).

7. When you finish designing your tactical mission, either click **Build Mission** or select **File > Build Mission** to build it.

For more information, see [Build Missions \(on page 224\)](#).

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

When the mission is built, Tactical Objects are converted to:

- VBS4 Control AI personnel and vehicle entities (see [Units Tool \(on the next page\)](#)).
- Waypoints (see [Advance Order Tool \(on page 80\)](#), [Assault Order Tool \(on page 84\)](#), [Suppress Order Tool \(on page 88\)](#), [Defend Order Tool \(on page 97\)](#)).
- VBS Call for Fire fire missions and gunlines (see [Fire Mission Order Tool \(on page 92\)](#) and VBS Call for Fire Overview in the VBS Call for Fire Manual).

When the mission runs, the built VBS4 AI personnel and vehicle entities:

- Execute Orders (see [Advance Order Tool \(on page 80\)](#), [Assault Order Tool \(on page 84\)](#), [Suppress Order Tool \(on page 88\)](#), [Defend Order Tool \(on page 97\)](#)).
- The Orders are converted to Waypoints (see Waypoints in the VBS4 Editor Manual).
- AI entities take Control Measures (see [Phase Line Tool \(on page 67\)](#), [Objective Tool \(on page 71\)](#), [Target Tool \(on page 76\)](#)) into account.

WARNING

Control AI entities do not take Boundary Lines (see [Boundary Line Tool \(on page 63\)](#)) into account.

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

4.1 Units Tool

Create tactical units on the map with the Tactical Unit Object, and give them Tactical Orders to execute.



TIP

You can create a custom tactical ORBAT. For more information, see [Create Custom ORBATS \(on page 245\)](#).

NOTE

It is also possible to use the ORBAT Editor (see [ORBAT Editor in the VBS4 Editor Manual](#)) to create generic tactical ORBATS, with the exception of civilian, artillery (used by VBS Call for Fire), and air (used by VBS Close Air Support) ORBATS.

Do any of the following:

- [Create a Tactical Unit Object \(on the next page\)](#)
- [Modify a Tactical Unit Object \(on page 60\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Unit Objects are converted to VBS4 Control AI personnel and vehicle entities.

When the mission runs, the built VBS4 AI personnel and vehicle entities execute Orders (see [Advance Order Tool \(on page 80\)](#), [Assault Order Tool \(on page 84\)](#), [Suppress Order Tool \(on page 88\)](#), [Defend Order Tool \(on page 97\)](#)), converted to Waypoints (see the [VBS4 Editor Manual](#)), and take Control Measures (see [Phase Line Tool \(on page 67\)](#), [Objective Tool \(on page 71\)](#), [Target Tool \(on page 76\)](#)) into account.

WARNING

Control AI entities do not take Boundary Lines (see [Boundary Line Tool \(on page 63\)](#)) into account.

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

⚠️ WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.1.1 Create a Tactical Unit Object

You can create a Tactical Unit object based on the MIL-STD-2525C doctrine, visible in 2D / 3D.

ℹ️ NOTE

In a group command structure, only the highest echelon symbology is displayed.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

ℹ️ NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **Units Tool**.



ℹ️ NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

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

Affiliation	Type	Subtype	Label	Symbol Preview
CZ	Air Unit	Amphibious Infantry	S1DC	
Civilian	Armored Brigade Co...	Platoon (AAV)	SFGRCUZ---D	
FR	Armor	Section (AAV)	Unique Designation	
GB	Ground Unit	Infantry	Higher Formation	
Generic OPFOR	Infantry Brigade Co...			
IN				
KR				
NL				
NZ				
SE				
US				

3. Select the Tactical Unit **Affiliation**, **Type**, **Subtype**, **Label**, using the values in each column.

 **NOTE**

The **Civilian** affiliation cannot be given Tactical Orders to execute. This affiliation matches a civilian pattern of life simulation that consists of 50 civilian pedestrians, which can also be created using the **Control AI - Civilian Editor Object** (the Editor Object provides additional settings that cannot be set in the **Civilian** affiliation). For more information, see Civilian AI and Population Editor Object in the VBS Control AI Manual.

 **TIP**

To create a new ORBAT or edit the ORBAT of the currently selected Tactical Unit in the ORBAT Editor (see the VBS4 Editor Manual), click **New ORBAT** or **Edit ORBAT**, respectively.

 **NOTE**

Not all the ORBATS can be edited.

4. Enter the **Unique Designation** and **Higher Formation**.

5. Click **Place**.

The Tactical Units table disappears.

6. Click a position on the map to place the Tactical Unit.

The Tactical Unit object is created on the map.

7. To be able to preview your mission, as described in the [VBS Plan Workflow \(on page 14\)](#), you need to have at least one playable unit in the mission, and build the mission:

 **WARNING**

A mission that does not have at least one playable unit, and is not built, cannot be previewed.

To add a playable unit in VBS Editor, see [Adding Units in the VBS4 Editor Manual](#).

To make a Tactical Unit playable in VBS Plan:

- a. Open **Unit Properties**.
- b. In **Name**, check the **Playable Unit** option.

 **NOTE**

Artillery Tactical Units that execute Fire Mission Orders (see [Fire Mission Order Tool \(on page 92\)](#)) are not playable.

For how to build a mission, see [Build Missions \(on page 224\)](#).

8. To give Tactical Orders to the Tactical Unit, see [Advance Order Tool \(on page 80\)](#), [Assault Order Tool \(on page 84\)](#), and [Suppress Order Tool \(on page 88\)](#).

To modify the Tactical Unit object, see [Modify a Tactical Unit Object \(below\)](#).

4.1.2 Modify a Tactical Unit Object

You can modify an existing Tactical Unit object.

Click the **Select Tool**.

 **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the object by clicking it.

A bounding box appears around the Tactical Unit object.

NOTE

The bounding-box points are disabled, as it is not possible to use them to resize a Tactical Unit object.

You can do any of the following:

- Drag the object to relocate it to a different position on the map.
- Modify the [Specific Properties \(below\)](#).
- To give Tactical Orders to the Tactical Unit, see [Advance Order Tool \(on page 80\)](#), [Assault Order Tool \(on page 84\)](#), and [Suppress Order Tool \(on page 88\)](#).
- Delete the object by pressing **Delete**.

The Tactical Unit object is modified.

4.1.3 Tactical Unit Properties

Set the following Tactical Unit properties.

4.1.3.1 Specific Properties

Properties before placement:

Specific Property	Description
Name	Tactical / CAS Unit name. NOTE The Playable Unit checkbox controls whether the Tactical Unit is playable in Execute Mode. WARNING To preview the mission as described in the VBS Plan Workflow (on page 14) , you need to have at least one playable Tactical Unit object on the map.

Additional properties after placement:

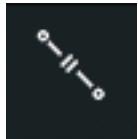
Specific Property	Description
Unique Designation	Text modifier for units, equipment, and installations, which uniquely identifies a particular symbol or track number.
Higher Formation	Text modifier for units that indicates a number or a title of higher-echelon command.

Location Description	Description of the location.
Altitude Description	Altitude information.
Reinf./Red.	Text modifier for a unit symbol, indicating whether the unit is reinforced.
Staff Comments	Custom text modifier for units, equipment, and installations.
SIDC	Unit symbol SIDC.
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

4.2 Boundary Line Tool

Using boundary lines, you can demarcate the battlefield.

Boundary lines allow you to specify movement boundaries for your Tactical Units.



Do any of the following:

- [Create a Boundary Line Object \(below\)](#)
- [Modify a Boundary Line Object \(on the next page\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Boundary Line Objects are converted to VBS4 mission entities.

WARNING

Control AI entities do not take Boundary Lines into account.

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.2.1 Create a Boundary Line Object

You can create a Boundary Line object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

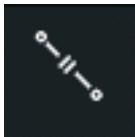
NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **Control Measures** (expanded by default).



3. Click the **Boundary Line Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Set the [Global Properties](#) (on the next page).
5. Set the [Specific Properties](#) (on page 66).
6. Click a position on the map to start a Boundary Line.
7. Click a position on the map to extend the line. Repeat as many times as required.
8. Double-click to finish drawing the line.

The Boundary Line object appears on the map, showing the control points.

9. Click outside the object.

The Boundary Line object is created on the map.

To modify the Boundary Line object, see [Modify a Boundary Line Object \(below\)](#).

4.2.2 Modify a Boundary Line Object

You can modify an existing Boundary Line object.

Follow these steps:

1. Click the **Select Tool** and select the Boundary Line object.

NOTE

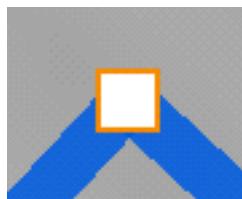
The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. You can do any of the following:

- To change the object shape, do any of the following:
 - Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(below\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The Boundary Line object is modified.

4.2.3 Boundary Line Properties

Set the following Boundary Line properties.

4.2.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">• Enter the stroke number.• Use the up / down arrows to increase / decrease the stroke.• Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.

Color Palette

You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the **Saved Colors** list.



Select to apply the selected border or fill color.



4.2.3.2 Specific Properties

Properties before placement:

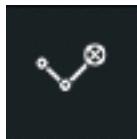
Specific Property	Description
Marker Type	Boundary marker type based on the values illustrated in the drop-down: <ul style="list-style-type: none"> • Team / Crew • Squad • Section • Platoon • Company • Battalion • Regiment • Brigade • Division • Corps • Army • Army Group • Theater
Marker Text (A / B)	First (A) and second (B) marker text to appear on the line.
Align Text Horizontally	Check this to align the text horizontally in 3D.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Font	Font family / type.
Font Size	Font size.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

4.3 Phase Line Tool

Use phase lines to specify operational timing and route planning to control and maneuver Tactical Units. If Tactical Units reach a phase before the specified time, they wait at the phase line until the specified time.



Do any of the following:

- [Create a Phase Line Object \(below\)](#)
- [Modify a Phase Line Object \(on the next page\)](#)

i NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Phase Line Objects are converted to VBS4 mission entities.

When the mission runs, the built VBS4 AI personnel and vehicle entities (see [Units Tool \(on page 57\)](#)) take the built Phase Line Control Measures into account, when moving.

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.



WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.3.1 Create a Phase Line Object

You can create a Phase Line object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

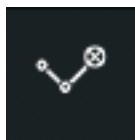
i NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **Control Measures** (expanded by default).



3. Click the **Phase Line Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Set the [Global Properties](#) (on the next page).
5. Set the [Specific Properties](#) (on page 70).
6. Click a position on the map to start a Phase Line.
7. Click a position on the map to extend the line. Repeat as many times as required.
8. Double-click to finish drawing the line.

The Phase Line object appears on the map, showing the control points.

9. Click outside the object.

The Phase Line object is created on the map.

To modify the Phase Line object, see [Modify a Phase Line Object \(below\)](#).

4.3.2 Modify a Phase Line Object

You can modify an existing Phase Line object.

Follow these steps:

1. Click the **Select Tool** and select the Phase Line object.

NOTE

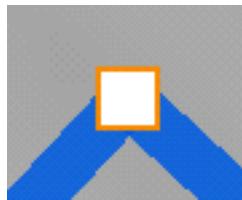
The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. You can do any of the following:

- To change the object shape, do any of the following:
 - Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(below\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The Phase Line object is modified.

4.3.3 Phase Line Properties

Set the following Phase Line properties.

4.3.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">• Enter the stroke number.• Use the up / down arrows to increase / decrease the stroke.• Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.

Color Palette

You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the **Saved Colors** list.



Select to apply the selected border or fill color.



4.3.3.2 Specific Properties

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.

Properties before placement:

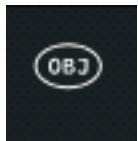
Specific Property	Description
Name	Phase Line name.
Time	Phase Line time (in the format hh:mm). <div style="border: 2px solid red; padding: 5px; margin-top: 10px;"> WARNING Tactical Units should not cross the Phase Line until the specified time. </div>
Ends	Phase Line symbol ends based on the graphic values in the Start and End drop-downs.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

4.4 Objective Tool

Use the Objective Tool to specify areas where units need to move, or as points for attack-by-fire missions.



Do any of the following:

- [Create an Objective Object \(below\)](#)
- [Modify an Objective Object \(on the next page\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Objective Objects are converted to VBS4 mission entities.

When the mission runs, the built VBS4 AI personnel and vehicle entities that execute a Suppress Order (see [Units Tool \(on page 57\)](#) and [Suppress Order Tool \(on page 88\)](#)) use the Objective Control Measures to fire at the enemy.

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.4.1 Create an Objective Object

You can create an Objective object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

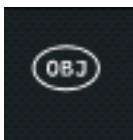
NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **Control Measures** (expanded by default).



3. Click the **Objective Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Set the [Global Properties](#) (on the next page).
5. Set the [Specific Properties](#) (on page 75).
6. Click a position on the map and hold the **LMB**, drag to set the Objective oval shape and size. Release the **LMB** to confirm.

The Objective object appears on the map and is selected.

7. Click outside the object.

The Objective object is created on the map.

To modify the Objective object, see [Modify an Objective Object \(below\)](#).

4.4.2 Modify an Objective Object

You can modify an existing Objective object.

Click the **Select Tool** and select the Objective object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

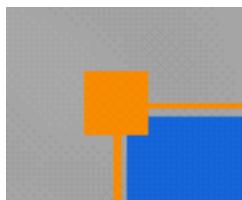
You can do any of the following:

- Click and hold the rotation point, and move the mouse to rotate the object.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the object.

- Drag any of the bounding-box points to change the object size.



- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(below\)](#).
- Modify the [Specific Properties \(on page 75\)](#).
- Delete the object by pressing **Delete**.

The Objective object is modified.

4.4.3 Objective Properties

Set the following Objective properties.

4.4.3.1 Global Properties

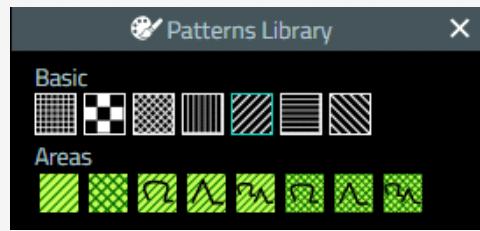
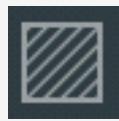
Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">Enter the stroke number.Use the up / down arrows to increase / decrease the stroke.Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Border Color	 Check the Border checkbox, then click the Border icon, and use the Color Palette to select the shape border color.

Color Palette

You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the **Saved Colors** list.



Select to apply the selected border or fill color.

**Patterns Library**

A library of patterns for filling shapes (designated by the Pattern icon).

The Basic fill patterns are:

- Grid Pattern
- Chessboard Pattern
- Grid Pattern 45°
- Line Pattern
- Line Pattern 45°
- Line Pattern 90°
- Line Pattern 315°

The Area fill patterns are:

- Bottom slow go
- Bottom no go
- Deciduous forest slow go
- Coniferous forest slow go
- Mixed forest slow go
- Deciduous forest no go
- Coniferous forest no go
- Mixed forest no go

Check the Pattern checkbox, then click the Pattern icon, and use the Patterns Library to select the pattern (basic or area).

**Pattern Scale**

Pattern scale. Do any of the following:

- Enter the scale number.
- Use the up / down arrows to increase / decrease the scale.
- Use the drop-down to select one of the preset values.

4.4.3.2 Specific Properties

Properties before placement:

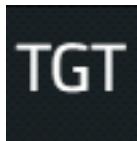
Specific Property	Description
Text	Objective text.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Width / Length	Object width / length (in meters).
Rotation	Rotation angle (in degrees) to rotate the object.

4.5 Target Tool

Use the Target Tool to specify targets for artillery Tactical Units that execute a Fire Mission Order (see [Fire Mission Order Tool \(on page 92\)](#)).



Do any of the following:

- [Create a Target Object \(below\)](#)
- [Modify a Target Object \(on the next page\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Target Objects are converted to VBS4 mission entities.

When the mission runs, the built VBS4 AI artillery entities, executing a Fire Mission Order (see [Units Tool \(on page 57\)](#) and [Fire Mission Order Tool \(on page 92\)](#)), use the built Target Control Measures to fire at the enemy.

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.5.1 Create a Target Object

You can create an Target object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **Control Measures** (expanded by default).



3. Click the **Target Tool**.

NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Click a position on the map where you want to place the Target object.

The New Target dialog opens.

5. Set the [Specific Properties \(on the next page\)](#) in the New Target dialog.

6. Click **Create New Target**.

The Target object appears on the map and is selected.

7. Click outside the object.

The Target object is created on the map.

To modify the Target object, see [Modify a Target Object \(below\)](#).

4.5.2 Modify a Target Object

You can modify an existing Target object.

Click the **Select Tool** and select the Target object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

You can do any of the following:

- Click and hold the rotation point, and move the mouse to rotate the object.

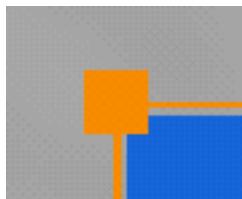


Alternatively, hold **Shift + RMB** and move the mouse to rotate the object.

i **NOTE**

Only Target objects with **Target Type** set to **Linear** or **Rectangle** can be rotated. For **Linear**, click the object twice to display the rotation point.

- Drag any of the bounding-box points to change the object size.



- Drag the object to relocate it to a different position on the map.
- Modify the [Specific Properties \(below\)](#).
- Delete the object by pressing **Delete**.

The Target object is modified.

4.5.3 Target Properties

Set the following Target properties.

4.5.3.1 Specific Properties

Properties before placement:

Specific Property	Description
Target Type	Target shape. Can be: <ul style="list-style-type: none">PointLinearRectangular
Name	Target name.

For **Target Type** set to **Linear**:

Specific Property	Description
-------------------	-------------

Azimuth	Target azimuth (in mils).
Width	Target width (in meters).

For **Target Type** set to **Rectangular**:

Specific Property	Description
Azimuth	Target azimuth (in mils).
Width	Target width (in meters).
Length	Target length (in meters).

Additional properties after placement:

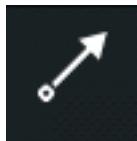
Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Width / Length	Object width / length (in meters).

 **NOTE**

Width / Length only apply to **Linear** and **Rectangular** targets.

4.6 Advance Order Tool

Apply an Advance Order to a Tactical Unit (see [Units Tool \(on page 57\)](#)) that executes when the mission runs.



Do any of the following:

- [Create an Advance Order \(below\)](#)
- [Modify an Advance Order \(on page 82\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Advance Order Objects are converted to VBS4 mission entities.

When the mission runs, the built VBS4 AI personnel and vehicle entities (see [Units Tool \(on page 57\)](#)) execute the built Advance Orders, converted to Waypoints (see the VBS4 Editor Manual).

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.6.1 Create an Advance Order

You can create an Advance Order (represented by an Advance Order object), visible in 2D / 3D.

Follow these steps:

1. To apply an Advance Order, select or create a Tactical Unit.

WARNING

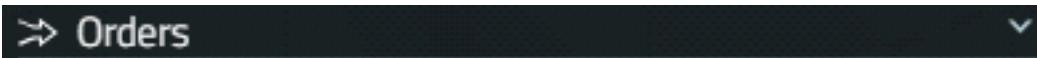
The tool is disabled if no Tactical Unit object is selected. For information on how to create a Tactical Unit object, see the [Units Tool \(on page 57\)](#).

2. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

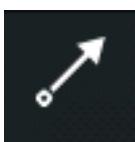
NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

3. Expand **Orders** (expanded by default).



4. Either click the **Advance Order Tool**, or right-click the **Tactical Unit object** and select **Add Advance Order**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

5. Click a position on the map to start an Advance Order line.
6. Click a position on the map to extend the line. Repeat as many times as required.
7. Double-click to finish drawing the line.

The Advance Order appears on the map, showing the control points.

8. Click outside the Advance Order object.

The Advance Order object is created on the map.

NOTE

If the Order is the first Order that the Tactical Units execute, then the Tactical Units face the Order direction when the mission runs.

To modify an Advance Order object, see [Modify an Advance Order \(on the next page\)](#).

4.6.2 Modify an Advance Order

You can modify an existing Advance Order object.

Click the **Select Tool**.

i NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the Advance Order by clicking it.

The Advance Order control points become visible.

You can do any of the following:

- To change the object shape, do any of the following:
 - Drag any of the control points, and click outside the object to confirm.

 - Delete any of the control points.
The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.
 - Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).
- Drag the object to relocate it to a different position on the map.
- Drag the Order time period in the [Timeline \(on page 32\)](#), to change the start and end Order time.
- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#).

- To chain the Advance Order with a new Order, either click an **Order Tool** icon, or right-click the **Advance Order** and select **Add Name Order**, where **Name** is the order type.

Depending on the Order type, see the Order object placement instructions in [Create an Advance Order \(on page 80\)](#), [Create an Assault Order \(on the next page\)](#), [Create a Suppress Order \(on page 88\)](#), and [Create a Defend Order \(on page 97\)](#).

- Delete the object by pressing **Delete**.

The Advance Order object is modified.

4.6.3 Advance Order Properties

Set the following Advance Order properties.

4.6.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">Enter the stroke number.Use the up / down arrows to increase / decrease the stroke.Use the drop-down to select one of the preset values.

4.6.3.2 Specific Properties

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](#).

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Start Time	Order start time (in the format hh:mm).

4.7 Assault Order Tool

Apply an Assault Order to a Tactical Unit (see [Units Tool \(on page 57\)](#)) that executes when the mission runs.



Do any of the following:

- [Create an Assault Order \(below\)](#)
- [Modify an Assault Order \(on page 86\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Assault Order Objects are converted to VBS4 mission entities.

When the mission runs, the built VBS4 AI personnel and vehicle entities (see [Units Tool \(on page 57\)](#)) execute the built Assault Orders, converted to Waypoints (see the VBS4 Editor Manual).

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.7.1 Create an Assault Order

You can create an Assault Order (represented by an Assault Order object), visible in 2D / 3D.

Follow these steps:

1. To apply an Assault Order, select or create a Tactical Unit.

WARNING

The tool is disabled if no Tactical Unit object is selected. For information on how to create a Tactical Unit object, see the [Units Tool \(on page 57\)](#).

2. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

3. Expand **Orders** (expanded by default).



4. Either click the **Assault Order Tool**, or right-click the **Tactical Unit object** and select **Add Assault Order**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

5. Set the [Specific Properties \(on page 87\)](#).

6. Click a position on the map to start an Assault Order line.
7. Click a position on the map to extend the line. Repeat as many times as required.
8. Double-click to finish drawing the line.

The Assault Order appears on the map, showing the control points.

9. Click outside the Assault Order object.

The Assault Order object is created on the map.

NOTE

If the Order is the first Order that the Tactical Units execute, then the Tactical Units face the Order direction when the mission runs.

To modify the Assault Order object, see [Modify an Assault Order \(on the next page\)](#).

4.7.2 Modify an Assault Order

You can modify an existing Assault Order.

Click the **Select Tool**.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the Assault Order by clicking it.

The Assault Order control points become visible.

You can do any of the following:

- To change the object shape, do any of the following:
 - Drag any of the control points, and click outside the object to confirm.

 - Delete any of the control points.
The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.
 - Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).
- Drag the object to relocate it to a different position on the map.
- Drag the Order time period in the [Timeline \(on page 32\)](#), to change the start and end Order time.
- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#).

- To chain the Assault Order with a new Order, either click an **Order Tool** icon, or right-click the **Assault Order** and select **Add Name Order**, where **Name** is the order type.

Depending on the Order type, see the Order object placement instructions in [Create an Advance Order \(on page 80\)](#), [Create an Assault Order \(on page 84\)](#), [Create a Suppress Order \(on the next page\)](#), and [Create a Defend Order \(on page 97\)](#).

- Delete the object by pressing **Delete**.

The Assault Order object is modified.

4.7.3 Assault Order Properties

Set the following Assault Order properties.

4.7.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">Enter the stroke number.Use the up / down arrows to increase / decrease the stroke.Use the drop-down to select one of the preset values.

4.7.3.2 Specific Properties

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](#).

Properties before placement:

Specific Property	Description
Start Time	Order start time (in the format hh:mm).
Lane Width	Order movement lane width (in meters).

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

4.8 Suppress Order Tool

Apply a Suppress Order to a Tactical Unit (see [Units Tool \(on page 57\)](#)) that executes when the mission runs, and uses objectives (see [Objective Tool \(on page 71\)](#)) to fire at the enemy.



Do any of the following:

- [Create a Suppress Order \(below\)](#)
- [Modify a Suppress Order \(on page 90\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Suppress Order Objects are converted to VBS4 mission entities.

When the mission runs, the built VBS4 AI personnel and vehicle entities (see [Units Tool \(on page 57\)](#)) execute the built Suppress Orders, converted to Waypoints (see the VBS4 Editor Manual), using the built Objective Control Measures (see [Objective Tool \(on page 71\)](#)).

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.8.1 Create a Suppress Order

You can create a Suppress Order (represented by a Suppress Order object), visible in 2D / 3D.

Follow these steps:

1. To apply a Suppress Order, select or create a Tactical Unit.

WARNING

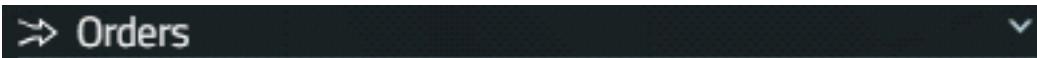
The tool is disabled if no Tactical Unit object is selected. For information on how to create a Tactical Unit object, see the [Units Tool \(on page 57\)](#).

2. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

3. Expand **Orders** (expanded by default).



4. To designate where the units need to fire, verify you have at least one objective created (see [Objective Tool \(on page 71\)](#)). To set an objective, see [Modify a Suppress Order \(on the next page\)](#).

WARNING

If no objective is created, the Suppress Order does not work.

5. Either click the **Suppress Order Tool**, or right-click the **Tactical Unit object** and select **Add Suppress Order**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

6. Click a position on the map, where you want the support by fire to take place.

The Suppress Order object appears on the map.

7. Move the mouse to rotate the Suppress Order object to set the direction in which the support by fire should take place. Click to confirm the direction.

The Suppress Order object is created on the map.

Since the Tactical Units first have to move to the Suppress Order position, a preceding Advance Order (see [Advance Order Tool \(on page 80\)](#)) is created as well, which is linked to the Suppress Order.

NOTE

If the Order is the first Order that the Tactical Units execute, then the Tactical Units face the Order direction when the mission runs.

To modify the Suppress Order object, see [Modify a Suppress Order \(on the next page\)](#).

4.8.2 Modify a Suppress Order

You can modify an existing Suppress Order.

Click the **Select Tool**.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the Suppress Order by clicking it.

A bounding box appears around the Suppress Order.

You can do any of the following:

- Click and hold the rotation point, and move the mouse to rotate the object.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the object.

- Drag the object to relocate it to a different position on the map.
- Drag the Order time period in the [Timeline \(on page 32\)](#), to change the start and end Order time.

Use the start and end arrows in the Timeline to shorten / lengthen the Order time.

NOTE

When dragging the start and end arrows, the modified time period is rounded to minutes.

- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#).

- To chain the Suppress Order with a new Order, either click an **Order Tool** icon, or right-click the **Suppress Order** and select **Add Name Order**, where **Name** is the order type.

Depending on the Order type, see the Order object placement instructions in [Create an Advance Order \(on page 80\)](#), [Create an Assault Order \(on page 84\)](#), [Create a Suppress Order \(on page 88\)](#), and [Create a Defend Order \(on page 97\)](#).

- Delete the object by pressing **Delete**.

The Suppress Order object is modified.

4.8.3 Suppress Order Properties

Set the following Suppress Order properties.

4.8.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">Enter the stroke number.Use the up / down arrows to increase / decrease the stroke.Use the drop-down to select one of the preset values.

4.8.3.2 Specific Properties

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](#).

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Width / Length	Object width / length (in meters).
Rotation	Rotation angle (in degrees) to rotate the object.
Objective	Objective associated with the order based on the values in the drop-down. The drop-down is populated with the available Objective objects.
Start Time	Order start time (in the format hh:mm).
End Time	Order end time (in the format hh:mm).

4.9 Fire Mission Order Tool

Apply a Fire Mission Order with a designated target (see [Target Tool \(on page 76\)](#)) to an artillery Tactical Unit (see [Units Tool \(on page 57\)](#)) that executes when the mission runs.



Do any of the following:

- [Create a Fire Mission Order \(below\)](#)
- [Modify a Fire Mission Order \(on page 94\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Fire Mission Order Objects are converted to VBS Call for Fire fire missions and gunlines (see [Fire Mission Order Tool \(above\)](#) and VBS Call for Fire Overview in the VBS Call for Fire Manual).

When the mission runs, the built VBS4 AI personnel and vehicle entities (see [Units Tool \(on page 57\)](#)) execute the built Fire Mission Orders, using the built Target Control Measures (see [Target Tool \(on page 76\)](#)).

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.

WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.9.1 Create a Fire Mission Order

You can create a Fire Mission Order, visible in the [Timeline \(on page 32\)](#).

Follow these steps:

1. To apply a Fire Mission Order, select or create a Tactical Unit.

WARNING

The tool is disabled if no artillery Tactical Unit object is selected. For information on how to create a Tactical Unit object, see the [Units Tool \(on page 57\)](#).

2. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

 **NOTE**

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

3. Expand **Orders** (expanded by default).



4. To designate where the units need to fire, verify you have at least one target created (see [Target Tool \(on page 76\)](#)). For more information, see step 3 of [Modify a Fire Mission Order \(on the next page\)](#).

 **WARNING**

If no target is created, the Fire Mission Order does not work.

5. Either click the **Fire Mission Order Tool**, or right-click the **Tactical Unit object** and select **Add Fire Mission Order**.



6. Set the [Specific Properties \(on page 96\)](#).

The Fire Mission Order appears in the [Timeline \(on page 32\)](#).

 **NOTE**

Fire Mission Orders are not Waypoints and can neither be chained to any other Control AI Waypoint Order, such as Advance, Assault, Suppress, or Defend Order (see [Advance Order Tool \(on page 80\)](#), [Assault Order Tool \(on page 84\)](#), [Suppress Order Tool \(on page 88\)](#), and [Defend Order Tool \(on page 97\)](#)) nor can it be chained to other Fire Mission Orders.

The Fire Mission creation / may have several error indicators. See [Fire Mission Order Errors \(on page 95\)](#).

To modify the Fire Mission Order object, see [Modify a Fire Mission Order \(on the next page\)](#).

4.9.2 Modify a Fire Mission Order

You can modify an existing Fire Mission Order.

WARNING

You can only modify an existing Fire Mission Order through VBS Plan in Prepare Mode, but not at runtime.

Canceling a Fire Mission Order that starts executing after it is built (see [Build Missions \(on page 224\)](#)) is possible in VBS Plan, but not recommended, as it may have unpredictable results.

Click the **Select Tool**.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the Fire Mission Order by clicking in the [Timeline \(on page 32\)](#) or under **Orders**.

You can do any of the following:

- Drag the Order time period in the [Timeline \(on page 32\)](#), to change the start and end Order time.

Use the start and end arrows in the Timeline to shorten / lengthen the Order time.

NOTE

When dragging the start and end arrows, the modified time period is rounded to minutes.

- Modify the [Specific Properties \(on page 96\)](#).
- Delete the Order by pressing **Delete**.

The Fire Mission Order is modified.

4.9.3 Fire Mission Order Errors

Fire Mission Order placement has the following VBS Call for Fire error feedback:

NOTE

The same error feedback is available in VBS Call for Fire.

Error	Resolution
Gunline has insufficient ammunition.	Decrease the Fire Mission Order duration, using Time on Target and End Time , or the fire rate, using Rounds per Minute , in Modify a Fire Mission Order (on the previous page).
Unattainable fire rate.	Adjust Rounds per Minute in the Modify a Fire Mission Order (on the previous page).
Mission would have to start before scenario.	Adjust Time on Target in the Modify a Fire Mission Order (on the previous page).
Target is farther than maximum range for supporting gun.	Move the Target (see Target Tool (on page 76)) closer to the Fire Mission Order (see Fire Mission Order Tool (on page 92)).
Target is closer than minimum range for supporting gun.	Move the Target (see Target Tool (on page 76)) farther from the Fire Mission Order (see Fire Mission Order Tool (on page 92)).
Firing solution for this target cannot be attained with supporting gun.	Change the Fire Mission Order (see Fire Mission Order Tool (on page 92)) terrain elevation by moving it, based on the minimum and maximum elevations indicated in the error for the given gun type.
Call for Fire is not compatible with Advanced Ballistics.	Disable the Advanced Ballistics option in Simulation Settings (see the VBS4 Administrator Manual).

4.9.4 Fire Mission Order Properties

Set the following Fire Mission Order properties.

4.9.4.1 Specific Properties

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](#).

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Available Targets	Artillery Tactical Unit target based on the values available in the drop-down. The drop-down is populated with the available Target objects. For information on creating artillery targets, see Target Tool (on page 76) .
Rounds per Minute	Artillery rounds per minute based on the values available in the drop-down.
Ammo Type	Artillery ammunition type based on the values available in the drop-down: <ul style="list-style-type: none">• HE• Smoke
Time on Target	Time when the first artillery projectile hits the target (in the format hh:mm).
End Time	Time after which no projectile hits the target (in the format hh:mm).

4.10 Defend Order Tool

Apply a Defend Order to a Tactical Unit (see [Units Tool \(on page 57\)](#)) that executes when the mission runs.

The defense behavior interchanges between taking cover and engaging the enemy.



Do any of the following:

- [Create a Defend Order \(below\)](#)
- [Modify a Defend Order \(on page 99\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), Defend Order Objects are converted to VBS4 mission entities.

When the mission runs, the built VBS4 AI personnel and vehicle entities (see [Units Tool \(on page 57\)](#)) execute the built Defend Orders, converted to Waypoints (see the VBS4 Editor Manual).

Rebuilding a mission resets the VBS4 entities based on their Tactical Objects representations.



WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

4.10.1 Create a Defend Order

You can create an Defend Order (represented by a Defend Order object), visible in 2D / 3D.

Follow these steps:

1. To apply a Defend Order, select or create a Tactical Unit.



WARNING

The tool is disabled if no Tactical Unit object is selected. For information on how to create a Tactical Unit object, see the [Units Tool \(on page 57\)](#).

2. In the [Tools Panel \(on page 23\)](#), select the **Tactical** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

3. Expand **Orders** (expanded by default).



4. Either click the **Defend Order Tool**, or right-click the **Tactical Unit object** and select **Add Defend Order**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

5. Set the [Specific Properties \(on page 101\)](#).

6. Click a position on the map, where you want the defense to take place.

The Defend Order object appears on the map.

7. Move the mouse to rotate the Defend Order object to set the direction in which the defense should take place. Click to confirm the direction.

The Defend Order object is created on the map.

Since the Tactical Units first have to move to the Defend Order position, a preceding Advance Order (see [Advance Order Tool \(on page 80\)](#)) is created as well, which is linked to the Defend Order.

The Defend Order has debug visualizations. See [Defend Order Debug Visualizations \(on page 100\)](#).

NOTE

If the Order is the first Order that the Tactical Units execute, then the Tactical Units face the Order direction when the mission runs.

NOTE

If no further Order is given after the Defend Order, the Tactical Units stay in their defensive positions indefinitely, regardless of the Defend Order duration (defined by the start and end Order time).

4.10.2 Modify a Defend Order

You can modify an existing Defend Order.

Click the **Select Tool**.

i NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the Defend Order by clicking it.

A bounding box appears around the Defend Order.

You can do any of the following:

- Click and hold the rotation point, and move the mouse to rotate the object.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the object.

- Drag the object to relocate it to a different position on the map.
- Drag the Order time period in the [Timeline \(on page 32\)](#), to change the start and end Order time.

Use the start and end arrows in the Timeline to shorten / lengthen the Order time.

i NOTE

When dragging the start and end arrows, the modified time period is rounded to minutes.

- Modify the [Global Properties \(on page 101\)](#).
- Modify the [Specific Properties \(on page 101\)](#).
- To chain the Defend Order with a new Order, either click an **Order Tool** icon, or right-click the **Defend Order** and select **Add Name Order**, where **Name** is the order type.

Depending on the Order type, see the Order object placement instructions in [Create an Advance Order \(on page 80\)](#), [Create an Assault Order \(on page 84\)](#), [Create a Suppress Order \(on page 88\)](#), and [Create a Defend Order \(on page 97\)](#).

- Delete the object by pressing **Delete**.

The Defend Order is modified.

4.10.3 Defend Order Debug Visualizations

The Defend Order provides debug visualizations that show how effective the defense is.

NOTE

The debug visualizations can only be enabled after the tactical mission is built (see [Build Missions \(on page 224\)](#)) and are only visible when the scenario executes.

FEATURE NOTICE

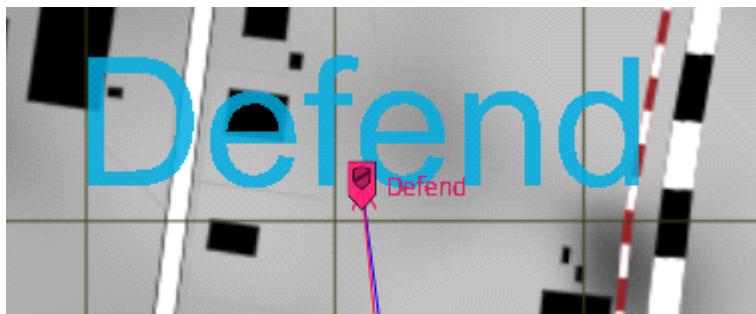
The debug visualizations vary, depending on the Tactical Unit type, and may change in future releases of VBS4.

Follow these steps:

1. Build the mission.

The Defend Order tactical symbol is converted to a Defend Order waypoint.

2. Double-click the Defend Order waypoint.



The waypoint Object Properties dialog opens.

3. Click **Advanced**, and set `debugEnabled` to `true`.
4. Click **OK** twice.
5. Run the scenario and observe the Defend Order waypoint visualizations.



EXAMPLE

For the squad Tactical Unit type, the green and red positions indicate good and bad defense spots, respectively.

Image-12: Squad Defend Order positions at nighttime



4.10.4 Defend Order Properties

Set the following Defend Order properties.

4.10.4.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">Enter the stroke number.Use the up / down arrows to increase / decrease the stroke.Use the drop-down to select one of the preset values.

4.10.4.2 Specific Properties

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.

Properties before placement:

Specific Property	Description
-------------------	-------------

Text	Defended location marker text.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Width / Length	Object width / length (in meters).
Rotation	Rotation angle (in degrees) to rotate the object.
Start Time	Order start time (in the format hh:mm).
End Time	Order end time (in the format hh:mm).

5. CAS Objects

The VBS Plan UI provides a set of Close Air Support (CAS) Tools to create CAS Objects, which are an extension of [Tactical Objects \(on page 53\)](#), to build a mission, and execute it.

★ FEATURE NOTICE

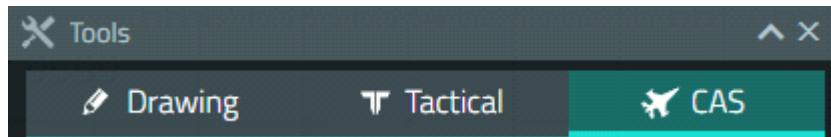
VBS Close Air Support may be subject to additional licensing. For more information, contact sales@bisimulations.com.

The CAS Objects appear in:

- VBS Plan (Prepare / Execute Mode)
- VBS Editor (Prepare / Execute Mode)
- C2 (Execute Mode)
- AAR (Assess Mode)

Like [Drawing Objects \(on page 157\)](#) and [Tactical Objects \(on page 53\)](#), you can place CAS Objects in overlays and manage them (see [Managing Overlays \(on page 211\)](#)).

In the [Tools Panel \(on page 23\)](#), select the **CAS** tab.



Select the CAS tool you want to use:

General CAS Tools

CAS Tool	Icon	Description
Select		Used to select overlay objects.
CAS Units		Used to create CAS MIL-2525C Units. To use the tool, see CAS Units Tool (on page 108) . To customize the CAS aircraft and munitions parameters, see CAS Unit Parameters (on page 113) .

Control Measure CAS Tools



Expand **Control Measures** (expanded by default):

CAS Tool	Icon	Description
Control Point (CP)		<p>Use the Control Point (CP) Tool for fixed-wing aircraft to:</p> <ul style="list-style-type: none"> • Define Holding Areas (HAs). • Define egress points. • Check-in with designated JTAC. • Maneuver prior to moving to the Initial Point (IP) (see CAS Initial Point (IP) Tool (on page 128)). <p>To use the tool, see CAS Control Point (CP) Tool (on page 125).</p>
Initial Point (IP)		<p>Used by fixed-wing aircraft as the starting point for maneuvering to the target.</p> <p>To use the tool, see CAS Initial Point (IP) Tool (on page 128).</p>
Holding Area (HA)		<p>Used by rotary-wing aircraft check-ins and CAS briefing prior to moving to the Battle Position (BP).</p> <p>To use the tool, see CAS Holding Area (HA) Tool (on page 131).</p>
Battle Position (BP)		<p>Used by rotary-wing aircraft to define the point where attacks on the target commence.</p> <p>To use the tool, see CAS Battle Position (BP) Tool (on page 134).</p>
No Fly Zone (NFZ)		<p>Used to specify where aircraft flight is restricted.</p> <p>To use the tool, see CAS No Fly Zone (NFZ) Tool (on page 137).</p>
No Fire Area (NFA)		<p>Used to specify where aircraft cannot fire munitions.</p> <p>To use the tool, see CAS No Fire Area (NFA) Tool (on page 142).</p>

Available Aircraft CAS Tool

Name	Status	Controls
A-10A	N/A	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-1	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-2	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-3	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
A-10A-4	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C	N/A	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-1	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-2	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-3	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>
F-16C-4	On hold	<input type="button" value="CH"/> <input type="button" value="Abort"/>

Expand **Available Aircraft** (expanded by default). The tool allows you to:

- Observe CAS aircraft status at CAS mission runtime.
- Control individual CAS aircraft at CAS mission runtime using Cleared Hot (CH) / Abort functions.
- Show / hide CAS aircraft splines (trajectories) and REDs (Risk-Estimate Distances).

For more information, see [CAS Available Aircraft Tool \(on page 123\)](#).

CAS Order Tools



Expand **Orders** (expanded by default):

WARNING

If no CAS Unit object is selected, the CAS Order Tools are disabled. For information on how to create a CAS Unit object, see the [CAS Units Tool \(on page 108\)](#).

CAS Tool	Icon	Description
CAS Mission Order		Used to create a CAS Mission Order for a CAS Unit object (see CAS Units Tool (on page 108)). To use the tool, see CAS Mission Order Tool (on page 147) .

NOTE

When CAS Mission Orders execute, the [CAS Mission List Panel \(on page 38\)](#) and [CAS Event List Panel \(on page 39\)](#) populate with CAS mission- and event-related information.

Follow these steps:

1. Make sure that the [Global Properties \(on page 238\)](#) and [Specific Properties \(on page 240\)](#) of the selected tool are set.
2. Create an object using the tool.

NOTE

The object is added to the selected overlay. For more information, see the [Managing Overlays \(on page 211\)](#).

3. If necessary, modify the existing object size / shape / location and [Specific Properties \(on page 240\)](#).

 **TIP**

Some tools enable you to delete control points to modify the shape of an object.



The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

4. Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo object modification actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

 **NOTE**

The bounding box does not exactly update its size to encapsulate objects when undo / redo is used. This does not affect functionality.

5. If you create CAS Units (see [CAS Units Tool \(on page 108\)](#)), you can assign CAS Orders (see [CAS Mission Order Tool \(on page 147\)](#)) and Control Measures (see [CAS Initial Point \(IP\) Tool \(on page 128\)](#), [CAS Control Point \(CP\) Tool \(on page 125\)](#), [CAS Holding Area \(HA\) Tool \(on page 131\)](#), [CAS Battle Position \(BP\) Tool \(on page 134\)](#), [CAS No Fly Zone \(NFZ\) Tool \(on page 137\)](#), [CAS No Fire Area \(NFA\) Tool \(on page 142\)](#)).

6. Review the CAS Plan that you created, using CAS Objects.

For more information, see [Review Plans \(on page 219\)](#).

7. When you finish designing your CAS mission, either click **Build Mission** or select **File > Build Mission** to build it.

For more information, see [Build Missions \(on page 224\)](#).

 **WARNING**

The following applies to CAS Units: if you build a mission, go back to the VBS Plan, and delete the CAS Objects representing the CAS Unit mission entities, the latter are not removed and have to be deleted manually in the Editor. Also, if you make any changes to CAS Unit mission entities represented by CAS Objects in the Editor, rebuilding a mission in the VBS Plan resets any of those changes.

When the mission is built, CAS Unit Objects are converted to VBS4 personnel and aircraft entities (see [CAS Units Tool \(on page 108\)](#)).

When the mission runs, the built VBS4 entities execute the CAS Orders (see [CAS Mission Order Tool \(on page 147\)](#)), using Control Measures (see [CAS Initial Point \(IP\) Tool \(on page 128\)](#), [CAS Control Point \(CP\) Tool \(on page 125\)](#), [CAS Holding Area \(HA\) Tool \(on page 131\)](#), [CAS Battle Position \(BP\) Tool \(on page 134\)](#), [CAS No Fly Zone \(NFZ\) Tool \(on page 137\)](#), [CAS No Fire Area \(NFA\) Tool \(on page 142\)](#)).

Rebuilding a mission resets the VBS4 entities based on their CAS Objects representations.

5.1 CAS Units Tool

You can create CAS aircraft units on the map, represented by the CAS Unit Object, and give them CAS Orders (see [CAS Mission Order Tool \(on page 147\)](#)) to execute.

To customize the CAS aircraft and munitions parameters, see [CAS Unit Parameters \(on page 113\)](#).



NOTE

It is not possible to use the ORBAT Editor (see [ORBAT Editor in the VBS4 Editor Manual](#)) to create custom air ORBATS.

Do any of the following:

- [Create a CAS Unit Object \(on the next page\)](#)
- [Modify a CAS Unit Object \(on page 111\)](#)

NOTE

When the mission is built (see [Build Missions \(on page 224\)](#)), CAS Unit Objects are converted to VBS4 Control AI personnel and aircraft entities.

When the mission runs, the built VBS4 AI personnel and aircraft entities execute CAS Orders (see [CAS Mission Order Tool \(on page 147\)](#)), using CAS Control Measures (see [CAS Initial Point \(IP\) Tool \(on page 128\)](#), [CAS Control Point \(CP\) Tool \(on page 125\)](#), [CAS Holding Area \(HA\) Tool \(on page 131\)](#), [CAS Battle Position \(BP\) Tool \(on page 134\)](#), [CAS No Fly Zone \(NFZ\) Tool \(on page 137\)](#), [CAS No Fire Area \(NFA\) Tool \(on page 142\)](#)), some of which represent waypoints.

Rebuilding a mission resets the VBS4 entities based on their CAS Objects representations.

WARNING

The following applies to CAS Units: if you build a mission, go back to the VBS Plan, and delete the CAS Objects representing the CAS Unit mission entities, the latter are not removed and have to be deleted manually in the Editor. Also, if you make any changes to CAS Unit mission entities represented by CAS Objects in the Editor, rebuilding a mission in the VBS Plan resets any of those changes.

5.1.1 Create a CAS Unit Object

You can create a CAS Unit object based on the MIL-STD-2525C doctrine, visible in 2D / 3D.

NOTE

In a group command structure, only the highest echelon symbology is displayed.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and click the **CAS Units Tool**.



NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

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

Units - MIL 2525C				
Affiliation	Type	Subtype	Label	Symbol Preview
EA	Air Unit	A-10A	1 Aircraft	
CZ	Armored Brigade Co...	A-10C	2 Aircraft	
Civilian	Ground Unit	AC-130H	4 Aircraft	
FR		AC-130U		
GB		AC-130W		
Generic OPFOR		AH-1W		
IN		AH-1W + UH-1Y		
KR		AH-1Z		
NL		AH-1Z + UH-1Y		
NZ		AH-64A		
SE		AH-6J		
US				

2. Select the CAS Unit **Affiliation**, **Type**, **Subtype**, **Label**, based on the available values in each column.

**TIP**

To create a new ORBAT or edit the ORBAT of the currently selected CAS Unit in the ORBAT Editor (see the VBS4 Editor Manual), click **New ORBAT** or **Edit ORBAT**, respectively.

**NOTE**

None of the CAS ORBATS can be edited.

3. Click **Place**.

The CAS Units table disappears.

4. Click a position on the map to place the CAS Unit.

The CAS Unit object is created on the map and is added to the Available Aircraft Panel (see [CAS Available Aircraft Tool \(on page 123\)](#)).

5. To be able to preview your mission, as described in the [VBS Plan Workflow \(on page 14\)](#), you need to have at least one playable unit in the mission, and build the mission:

**WARNING**

The following considerations apply:

- A mission that does not have at least one playable unit, and is not built, cannot be previewed.

To add a playable unit in VBS Editor, see [Adding Units in the VBS4 Editor Manual](#).

- Rebuilding a mission overrides any changes made to the built CAS Unit entities in the VBS Editor (Prepare Mode).

For how to build a mission, see [Build Missions \(on page 224\)](#).

6. To assign aircraft routing and CAS Orders to the CAS Unit, see [CAS Mission Order Tool \(on page 147\)](#).

To modify the CAS Unit object, see [Modify a CAS Unit Object \(on the next page\)](#).

5.1.2 Modify a CAS Unit Object

You can modify an existing CAS Unit object.

Click the **Select Tool**.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the object by clicking it.

A bounding box appears around the CAS Unit object.

NOTE

The bounding-box points are disabled, as it is not possible to use them to resize a CAS Unit object.

You can do any of the following:

- Drag the object to relocate it to a different position on the map.
- Change the default CAS Unit loadout in **Air Section Loadout**:

NOTE

For information on how to configure aircraft loadouts, see [Loadouts in CAS Unit Parameters \(on page 113\)](#).

- For all the aircraft in the CAS Unit, select one of the available loadouts in the **Air Section** drop-down.
- For a specific CAS Unit aircraft, select one of the available loadouts from the drop-down next to the specific CAS Unit aircraft.
- Change the CAS Unit clearance call type (Cleared Hot or Abort) using the **Available Aircraft Panel**. For more information, see [CAS Available Aircraft Tool \(on page 123\)](#).
- To assign aircraft routing and CAS Orders to the CAS Unit, see [CAS Mission Order Tool \(on page 147\)](#).
- Modify the [Specific Properties \(on the next page\)](#).

- Delete the object by pressing **Delete**.

NOTE

Associated Editor objects are automatically deleted when you rebuild the mission (see [Build Missions \(on page 224\)](#)), if you do not delete them manually.

The CAS Unit object is modified.

5.1.3 CAS Unit Properties

Set the following CAS Unit properties.

5.1.3.1 Specific Properties

NOTE

All the Unit Properties, apart from **Name**, can only be set in Prepare Mode, while **Name** can also be set in Preview / Execute Mode.

Specific Property	Description
Name	Tactical / CAS Unit name. NOTE The Playable Unit checkbox controls whether the Tactical Unit is playable in Execute Mode.
Unique Designation	Text modifier for units, equipment, and installations, which uniquely identifies a particular symbol or track number.
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

5.2 CAS Unit Parameters

You can modify some of the CAS Unit (see [CAS Units Tool \(on page 108\)](#)) parameters to change the aircraft and munitions functionality.

The modification is done using a JSON file, called `cas_parameters.json`, located in:

`\VBS_Installation\Components\VBSChalkboard\config\`

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.

The CAS Unit parameters are divided into the following sections:

- [Loadouts \(below\)](#)
- [Munitions \(on the next page\)](#)
- [Dispersion \(on page 117\)](#)
- [Aircraft \(on page 120\)](#)

5.2.1 Loadouts

You can configure aircraft loadouts and then assign these loadouts to specific aircraft.

Loadouts are specified in the `Loadouts` JSON object:

```
"Loadouts": {  
    "Loadout Name 1": {  
        "Munition Type Name 1": Munition Quantity,  
        "Munition Type Name 2": Munition Quantity,  
        ...  
    },  
    "Loadout Name 2": {  
        ...  
    },  
    ...  
}
```

TIP

Set the munition quantity to -1 for unlimited munitions.

⚠️ WARNING

When the scenario executes, there is no way to rearm an aircraft with a limited munitions supply.

Each loadout can contain several munition types. To specify munition types, see [Munitions \(below\)](#).

Also, aircraft can have multiple loadouts. See [Aircraft \(on page 120\)](#).

Example:

```
"Loadouts": {  
    "ARH default loadout": {  
        "Hydra HE": 14, "AGM-114K": 8, "30M M781": 450  
    },  
    "ARH loadout 2": {  
        "AGM-114K": 16, "30M M781": 450  
    }  
}
```

See the [Munitions \(below\)](#) example for definitions of some munition types used in this example.

5.2.2 Munitions

You can configure munition types and then assign these types to specific aircraft.

Munition types are defined in the [AmmoTypes](#) JSON object:

```
"AmmoTypes": {  
    "Munition Type Name 1": {  
        "class": "Munition Class Name",  
        "simulationType": "Simulation Type Name",  
        "weaponLock": "Target-Locking Type Name (for Guided Munitions)",  
        "RiskEstimateDistances": {  
            "lethalRange": Lethal Range (Meters),  
            "indirectHitRange": Indirect Hit Range (Meters)  
        },  
        "minAttackRange": Minimum Attack Range (Meters),  
        "optimalAttackRange": Optimal Attack Range (Meters),  
        "rateOfFire": Number of seconds between each shot,  
        "shotSpeed":  
            Munition Muzzle Speed (Meters per Second) (increment to the aircraft velocity),  
        "logAllImpacts": Log All Munition Impacts? (true or false),  
        "dispersion": "Dispersion Interpolation Table Name"  
    },  
    "Munition Type Name 2": {  
        ...  
    }  
}
```

```
 },  
 ...  
 }
```

The following **AmmoTypes > Munition Type Name** parameters require special attention:

Parameter	Description
class	Represents an existing munition configuration class in VBS4. For more information on munition classes, see Ammunition Configuration in the VBS Developer Reference.
simulationType	Represents an existing munition simulation type, which can be: <ul style="list-style-type: none">bomb - Unguided bomb simulation.cannon - Cannon (such as a machine gun) simulation.rocket - Unguided rocket simulation.missile - Guided missile simulation.sensor - Sensor (such as an optic sensor) simulation.
	<div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"><p>i NOTE</p><p>This simulation type requires only the definition of the class and simulationType parameters. No other AmmoTypes > Munition Type Name parameters are required.</p></div>
weaponLock	Represents the guided-munition target-locking type, which can be: <ul style="list-style-type: none">IR - Infrared (IR) target locking.PRF - Pulse Repetition Frequency (PRF) target locking.GPS - Global Positioning System (GPS) target locking.
	<div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"><p>i NOTE</p><p>Only applies to simulationType > missile or bomb munitions.</p></div>
logAllImpacts	The value of this parameter can be: <ul style="list-style-type: none">true - Logs every munition impact as a Munition Impact event in the CAS Event List Panel (on page 39).false - Only logs the first munition impact as a Munition Impact event in the CAS Event List Panel (on page 39).
dispersion	The name of a Dispersion Interpolation Table (DIT). To define a DIT, see Dispersion (on page 117) .

Once munition types are defined, they can be used in the **Loadouts** JSON (see [Loadouts \(on page 113\)](#)).

Example:

```
"AmmoTypes": {  
    "AGM-114K": {  
        "class": "vbs2_ammo_M_Hellfire_AGM114K",  
        "simulationType": "missile",  
        "weaponLock": "PRF",  
        "RiskEstimateDistances": {  
            "lethalRange": 40,  
            "indirectHitRange": 110  
        },  
        "minAttackRange": 2000.0,  
        "optimalAttackRange": 9000.0,  
        "rateOfFire": 1,  
        "shotSpeed": 700,  
        "logAllImpacts": true,  
        "dispersion": "Missile9"  
    }  
    "30M M781": {  
        "class": "vbs2_ammo_B_30mm_SAPHEI",  
        "simulationType": "cannon",  
        "RiskEstimateDistances": {  
            "lethalRange": 35,  
            "indirectHitRange": 125  
        },  
        "minAttackRange": 2000.0,  
        "optimalAttackRange": 4000.0,  
        "rateOfFire": 0.25,  
        "shotSpeed": 700,  
        "logAllImpacts": true,  
        "dispersion": "Large"  
    }  
}
```

For the **Missile9** and **Large** DIT definitions, see the [Dispersion \(on the next page\)](#) example.

5.2.3 Dispersion

You can configure dispersion for specific CAS munitions, for all aircraft armed with these munitions to use. Dispersion allows projectiles to miss targets by a certain margin of error. To control the margin of error, Dispersion Interpolation Tables (DITs) are used

NOTE

To enable / disable the CAS dispersion specified in `cas_parameters.json`, see **CAS Dispersion** in the Simulation Settings in the VBS4 Administrator Manual. Disabling dispersion is equivalent to setting it to 0.

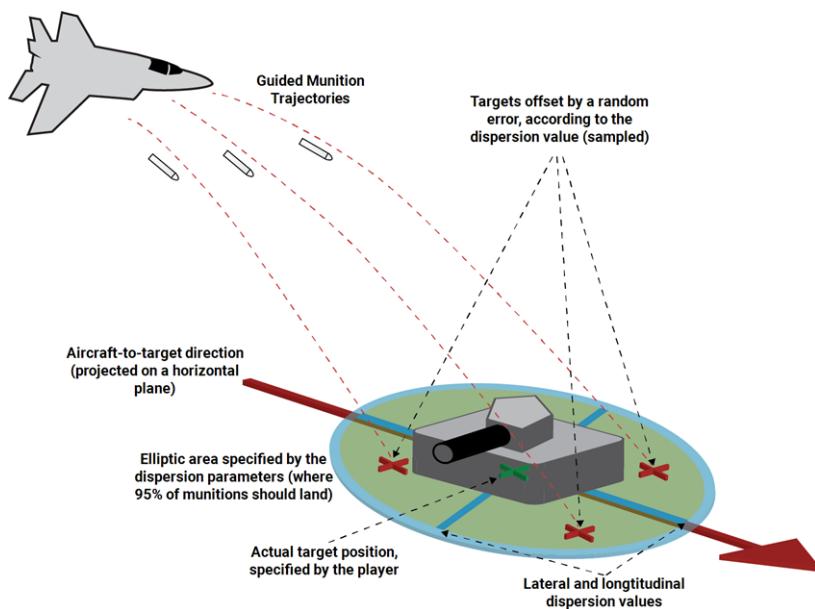
Dispersion Interpolation Table (DIT)

The dispersion behavior is simulated by offsetting the target position by a random error vector, which allows you to directly control the expected size of the error vector, and achieve predictable dispersion.

The dispersion behavior is defined by lateral and longitudinal values (distances). The longitudinal value corresponds to the variance of the error vector along the aircraft-to-target direction, while the lateral value to the horizontal orthogonal direction. This means that the lateral dispersion value specifies half of the width of the area, where 95% of shots land, and the longitudinal dispersion value specifies half of the length of the area, where 95% of shots land.

The error vector lies in the horizontal plane (in the 3D space). It is picked at random with normal distribution. The parameters of the normal distribution are set in such way that (statistically) 95% of the picked vectors lie inside an ellipse with the dimensions specified by the DIT (the lateral value is used for the semi-minor axis of the ellipse, while the longitudinal value for the semi-major axis).

Image-13: Guided munition dispersion example



The DIT is used to look up specific dispersion values (lateral and longitudinal) for specific situations. The JSON parameters to look up the values are:

- **distance** - Straight-line distance (in meters) from the aircraft to its target. A DIT can contain several distance values.
- **diveAngle** - Dive angle (in degrees) that creates the slope of the line connecting the aircraft to its target. A DIT can contain several dive-angle values.

i NOTE

The following considerations apply:

- Dive angle depends on the aircraft and target positions, not the aircraft speed. The DIT consists of lines with dive angles, and one or more of the distance values for each dive angle. Dispersion values are looked up / interpolated based on the actual distance and dive angle.
- If a DIT line consists only of one entry for distance, this value is used for every distance. If the DIT consists only of one line, this line is used for every dive-angle value. DIT lines do not necessarily need to be in ascending order, nor do they need to have the same number of entries.
- If the actual distance / dive angle is outside the range specified in the DIT, then the closest available distance / dive angle in the DIT to the actual distance / dive angle is used. For example, if the actual distance is 20000m, and the closest distance in the DIT is 1000m, then 1000m is used. Similarly, if the DIT contains 45- and 60-degree dive angles, while the actual dive angle is 0 degrees, then the 45-degree dive angle is used.

You can create new DITs to use for specific munitions. DITs are defined in the

AmmoDispersionTypes JSON object:

```
"AmmoDispersionTypes": {
    "DIT Name 1": [
        {
            "diveAngle": Dive Angle Value (Degrees),
            "dispersions": [
                {
                    "distance": Distance Value (Meters),
                    "lateral": Semi-Major Axis Value (Meters),
                    "longitudinal": Semi-Minor Axis Value (Meters)
                }
            ]
        }
    ],
    "DIT Name 2": [
        {
            "diveAngle": Dive Angle Value (Degrees),

```

```
"dispersions": [
    {
        "distance": Distance Value (Meters),
        "lateral": Semi-Major Axis Value (Meters),
        "longitudinal": Semi-Minor Axis Value (Meters)
    }
],
...
}
```

Example:

This example contains the following DIT definitions:

- **Large** - Large dispersion, with several dive angles.
- **Missile9** - This DIT always returns the same value, regardless of distance and dive angle, which can be useful for guided missiles.

```
"AmmoDispersionTypes": {
    "Large": [
        {
            "diveAngle": 0,
            "dispersions": [
                { "distance": 1000, "lateral": 20, "longitudinal": 40 },
                { "distance": 2000, "lateral": 30, "longitudinal": 50 },
                { "distance": 5000, "lateral": 40, "longitudinal": 60 }
            ]
        },
        {
            "diveAngle": 15,
            "dispersions": [
                { "distance": 1000, "lateral": 15, "longitudinal": 25 },
                { "distance": 5000, "lateral": 30, "longitudinal": 50 }
            ]
        },
        {
            "diveAngle": 45,
            "dispersions": [
                { "distance": 500, "lateral": 10, "longitudinal": 15 },
                { "distance": 2000, "lateral": 15, "longitudinal": 20 },
                { "distance": 5000, "lateral": 25, "longitudinal": 30 }
            ]
        }
    ],
    "Missile9": [
        ...
    ]
}
```

```
{  
    "diveAngle": 0,  
    "dispersions": [  
        { "distance": 500, "lateral": 9, "longitudinal": 9 }  
    ]  
},  
}  
]
```

Munitions are defined in the [AmmoTypes](#) JSON object (see [Munitions \(on page 114\)](#)). To associate a DIT with a munition type, use the [dispersion](#) parameter in the munition type definition:

```
"AmmoTypes": {  
    "Munition Type Name": {  
        ...  
        "dispersion": "DIT Name"  
    },  
}
```

5.2.4 Aircraft

You can configure the aircraft itself and use the [Loadouts \(on page 113\)](#) (and, consequently, [Munitions \(on page 114\)](#) and [Dispersion \(on page 117\)](#)) configuration.

Aircraft are specified in the [Aircrafts](#) JSON object:

```
"Aircrafts": {  
    "Aircraft Name": {  
        "maxDiveAngle": Maximum Dive Angle (Degrees),  
        "maxRollAngle": Maximum Roll Angle (Degrees),  
        "maxAngularVelocity": Maximum Angular Velocity (Degrees per Second),  
        "maxAttackPitch": Maximum Attack Pitch (Degrees),  
        "minAttackPitch": Minimum Attack Pitch (Degrees),  
        "cruiseSpeed": Cruise Speed (Meters per Second),  
        "attackSpeed": Attack Speed (Meters per Second),  
        "holdingRadius": Routing Area Radius (Meters),  
        "egressTravelLength": Distance to Egress Location (Meters),  
        "minFlyAltitude": Minimal Flight Altitude (Meters),  
        "flySpeed": Flight Speed (Meters per Second),  
        "diveSpeed": Dive Speed (Meters per Second),  
        "flyAltitude": Flight Altitude (Meters),  
        "loadouts": ["Loadout Name 1", "Loadout Name 2", ...]  
    }  
}
```

Aircraft Parameter	Units of Measurement	Description
<code>maxDiveAngle</code>	Degrees	Maximum dive angle achieved when performing a Dive attack pattern (see Attack Profile in CAS Mission Order Tool (on page 147)).
<code>maxRollAngle</code>	Degrees	Used when calculating the roll angle based on spline curvature, limits the resulting roll angle at a point on the spline.
<code>maxAngularVelocity</code>	Degrees/s	Used when calculating the roll angle based on spline curvature, limits the angular speed at a point on the spline at which the <code>maxRollAngle</code> is achieved.
<code>maxAttackPitch</code>	Degrees	Used to validate a firing solution for rotary-wing aircraft, specifically the firing angle of the aircraft at the calculated firing position.
<code>minAttackPitch</code>	Degrees	Used to validate a firing solution for rotary-wing aircraft, specifically the firing angle of the aircraft at the calculated firing position.
<code>cruiseSpeed</code>	m/s	Aircraft attempts to accelerate to this speed when approaching the IP or BP.
<code>attackSpeed</code>	m/s	Used by rotary-wing aircraft in a Level attack pattern (see Attack Profile in CAS Mission Order Tool (on page 147)).
<code>holdingRadius</code>	Meters	Default Holding Area radius when egressing from a mission.
<code>egressTravelLength</code>	Meters	Distance the aircraft travels during egress, when a specific egress direction is specified.
<code>minFlyAltitude</code>	Meters	AGL and is used during terrain following and path / spline planning, so the spline does not go under this value.
<code>flySpeed</code>	m/s	Aircraft attempts to accelerate to this speed when approaching a Holding Area.
<code>diveSpeed</code>	m/s	Aircraft attempts to accelerate to this speed when performing the actual dive during a Dive attack pattern (see Attack Profile in CAS Mission Order Tool (on page 147)).
<code>flyAltitude</code>	Meters	Overrides the default Holding Area applied to aircraft when starting a mission for the first time.
<code>loadouts</code>	<code>Loadout Name 1</code> , <code>"Loadout Name 2"</code> , ...	List of unique identifiers for one or more loadouts, specified in the Loadouts (on page 113) class.

In `loadouts`, use one or more of the loadouts that you defined in [Loadouts \(on page 113\)](#).

Example:

```
"Aircrafts": {  
    "ARH": {  
        "maxDiveAngle": 10.0,  
        "maxRollAngle": 25.0,  
        "maxAngularVelocity": 4.0,  
        "maxAttackPitch": 16.0,  
        "minAttackPitch": 0.0,  
        "cruiseSpeed": 55.5555,  
        "attackSpeed": 38.8889,  
        "holdingRadius": 400.0,  
        "egressTravelLength": 400.0,  
        "minFlyAltitude": 50,  
        "flySpeed": 69.4444,  
        "flyAltitude": 308.0,  
        "loadouts": ["ARH default loadout", "ARH loadout 2"]  
    }  
}
```

For the example definitions in [loadouts](#), see the [Loadouts \(on page 113\)](#) example.

5.3 CAS Available Aircraft Tool

After adding CAS Units using the [CAS Units Tool \(on page 108\)](#), you can manage them in the Available Aircraft Panel, which displays a list of added CAS Units.

Available Aircraft		
Name	Status	Controls
A-10A	N/A	
A-10A-1	On hold	CH Abort
A-10A-2	On hold	CH Abort
A-10A-3	On hold	CH Abort
A-10A-4	On hold	CH Abort
F-16C	N/A	
F-16C-1	On hold	CH Abort
F-16C-2	On hold	CH Abort
F-16C-3	On hold	CH Abort
F-16C-4	On hold	CH Abort

Select a CAS Unit or individual aircraft in the Available Aircraft Panel.

Do any of the following:

- To change the visibility of aircraft splines (flying trajectories) and REDs (Risk-Estimate Distances), click any of the following **Eye** icons:



- In each row, representing either a CAS Unit or individual aircraft.
- At the panel top, for all the CAS Units in the CAS mission.

- To show the available aircraft in a CAS Unit, expand the listed CAS Unit.



- To change the clearance call type, use the **Controls** column for the aircraft that receive the clearance call from the JTAC.

To change the clearance call to Cleared Hot (CH), click **CH**.

To abort the CAS mission for the selected aircraft in the CAS Unit, click **Abort**.

- The **Status** shows any of the following aircraft statuses:

NOTE

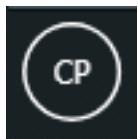
Other CAS mission statuses are displayed in the Mission List (see [CAS Mission List Panel \(on page 38\)](#)).

Aircraft Status	Description
Waiting	Aircraft is waiting to start a mission due to user-defined separation.
Ingress	Aircraft is ingressing to an IP.
Egressing	Shows when individual aircraft are currently egressing to their final location.
On Hold	Shows when all or individual aircraft are in a Holding Pattern (HP) either from routing or after egressing.
Cleared Hot	Shows when an individual aircraft is Cleared Hot (CH) and inbound to the target.

5.4 CAS Control Point (CP) Tool

Use the Control Point (CP) Tool to create Control Measure points for fixed-wing aircraft, prior to moving to the Initial Point (IP) (see [CAS Initial Point \(IP\) Tool \(on page 128\)](#)), to:

- Define routing points.
- Define egress points.
- Check-in with designated JTAC.



Do any of the following:

- [Create a CAS CP Object \(below\)](#)
- [Modify a CAS CP Object \(on the next page\)](#)

i **NOTE**

When the mission runs, the built (see [Build Missions \(on page 224\)](#)) VBS4 aircraft entities (see [CAS Units Tool \(on page 108\)](#)) use the CAS CP Objects.

5.4.1 Create a CAS CP Object

You can create a CAS CP object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and expand **Control Measures** (expanded by default).



i **NOTE**

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **CAS CP Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Click a position on the map where you want to place the CAS CP object.

The New Control Point dialog opens.

4. Set the [Specific Properties \(on the next page\)](#) in the New Control Point dialog.

5. Click **Create**.

The CAS CP object appears on the map and is selected.

6. Click outside the object.

The CAS CP object is created on the map.

To modify the CAS CP object, see [Modify a CAS CP Object \(below\)](#).

5.4.2 Modify a CAS CP Object

You can modify an existing CAS CP object.

Click the **Select Tool** and select the CAS CP object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

You can do any of the following:

- Drag the object to relocate it to a different position on the map.
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The CAS CP object is modified.

5.4.3 CAS CP Properties

Set the following CAS CP properties.

5.4.3.1 Specific Properties

Properties before placement:

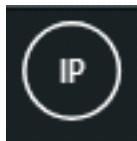
Specific Property	Description
Name	CP name.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM

Additional properties after placement:

Specific Property	Description
Text	CP name.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
Base Alt.	Object AGL altitude (in meters) in the 3D View.

5.5 CAS Initial Point (IP) Tool

Use the Initial Point (IP) Tool to create Control Measure points for fixed-wing aircraft as starting points for maneuvering to the target.



Do any of the following:

- [Create a CAS IP Object \(below\)](#)
- [Modify a CAS IP Object \(on the next page\)](#)

NOTE

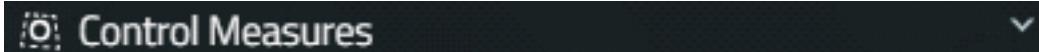
When the mission runs, the built (see [Build Missions \(on page 224\)](#)) VBS4 aircraft entities (see [CAS Units Tool \(on page 108\)](#)) use the CAS IP Objects.

5.5.1 Create a CAS IP Object

You can create a CAS IP object, visible in 2D / 3D.

Follow these steps:

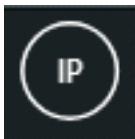
1. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and expand **Control Measures** (expanded by default).



NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **CAS IP Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Click a position on the map where you want to place the CAS IP object.

The New Initial Point dialog opens.

4. Set the [Specific Properties \(below\)](#) in the New Initial Point dialog.

5. Click **Create**.

The CAS IP object appears on the map and is selected.

6. Click outside the object.

The CAS IP object is created on the map.

To modify the CAS IP object, see [Modify a CAS IP Object \(below\)](#).

5.5.2 Modify a CAS IP Object

You can modify an existing CAS IP object.

Click the **Select Tool** and select the CAS IP object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

You can do any of the following:

- Drag the object to relocate it to a different position on the map.
- Modify the [Specific Properties \(below\)](#).
- Delete the object by pressing **Delete**.

The CAS IP object is modified.

5.5.3 CAS IP Properties

Set the following CAS IP properties.

5.5.3.1 Specific Properties

Properties before placement:

Specific Property	Description
Name	IP name.

Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
-----------------	--

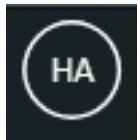
Additional properties after placement:

Specific Property	Description
Text	IP name.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
Base Alt.	Object AGL altitude (in meters) in the 3D View.

5.6 CAS Holding Area (HA) Tool

Use the Holding Area (HA) tool to create Control Measure points for rotary-wing aircraft, prior to moving to the Battle Position (BP) (see [CAS Battle Position \(BP\) Tool \(on page 134\)](#)), to:

- Define routing points.
- Define egress points.
- Check-in with designated JTAC.



Do any of the following:

- [Create a CAS HA Object \(below\)](#)
- [Modify a CAS HA Object \(on the next page\)](#)

i **NOTE**

When the mission runs, the built (see [Build Missions \(on page 224\)](#)) VBS4 aircraft entities (see [CAS Units Tool \(on page 108\)](#)) use the CAS HA Objects.

5.6.1 Create a CAS HA Object

You can create a CAS HA object, visible in 2D / 3D.

Follow these steps:

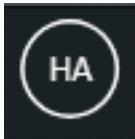
1. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and expand **Control Measures** (expanded by default).



i **NOTE**

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **CAS HA Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Click a position on the map where you want to place the CAS HA object.

The New Holding Area dialog opens.

4. Set the [Specific Properties \(on the next page\)](#) in the New Holding Area dialog.

5. Click **Create**.

The CAS HA object appears on the map and is selected.

6. Click outside the object.

The CAS HA object is created on the map.

To modify the CAS HA object, see [Modify a CAS HA Object \(below\)](#).

5.6.2 Modify a CAS HA Object

You can modify an existing CAS HA object.

Click the **Select Tool** and select the CAS HA object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

You can do any of the following:

- Drag the object to relocate it to a different position on the map.
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The CAS HA object is modified.

5.6.3 CAS HA Properties

Set the following CAS HA properties.

5.6.3.1 Specific Properties

Properties before placement:

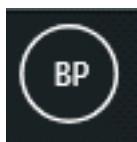
Specific Property	Description
Name	HA name.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM

Additional properties after placement:

Specific Property	Description
Text	HA name.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
Base Alt.	Object AGL altitude (in meters) in the 3D View.

5.7 CAS Battle Position (BP) Tool

Use the Battle Position (BP) Tool to create Control Measure points for rotary-wing aircraft as starting points for maneuvering to the target.



Do any of the following:

- [Create a CAS BP Object \(below\)](#)
- [Modify a CAS BP Object \(on the next page\)](#)

NOTE

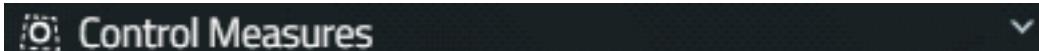
When the mission runs, the built (see [Build Missions \(on page 224\)](#)) VBS4 aircraft entities (see [CAS Units Tool \(on page 108\)](#)) use the CAS BP Objects.

5.7.1 Create a CAS BP Object

You can create a CAS BP object, visible in 2D / 3D.

Follow these steps:

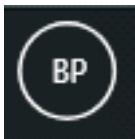
1. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and expand **Control Measures** (expanded by default).



NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **CAS BP Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Click a position on the map where you want to place the CAS BP object.

The New Battle Position dialog opens.

4. Set the [Specific Properties \(below\)](#) in the New Battle Position dialog.

5. Click **Create**.

The CAS BP object appears on the map and is selected.

6. Click outside the object.

The CAS BP object is created on the map.

To modify the CAS BP object, see [Modify a CAS BP Object \(below\)](#).

5.7.2 Modify a CAS BP Object

You can modify an existing CAS BP object.

Click the **Select Tool** and select the CAS BP object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

You can do any of the following:

- Drag the object to relocate it to a different position on the map.
- Modify the [Specific Properties \(below\)](#).
- Delete the object by pressing **Delete**.

The CAS BP object is modified.

5.7.3 CAS BP Properties

Set the following CAS BP properties.

5.7.3.1 Specific Properties

Properties before placement:

Specific Property	Description
Name	BP name.

Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
-----------------	--

Additional properties after placement:

Specific Property	Description
Text	BP name.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
Base Alt.	Object AGL altitude (in meters) in the 3D View.

5.8 CAS No Fly Zone (NFZ) Tool

Use the No Fly Zone (NFZ) Tool to designate No Fly Zones on the map for your CAS Unit (see [CAS Units Tool \(on page 108\)](#)).



Do any of the following:

- [Create a CAS NFZ Object \(below\)](#)
- [Modify a CAS NFZ Object \(on the next page\)](#)

i **NOTE**

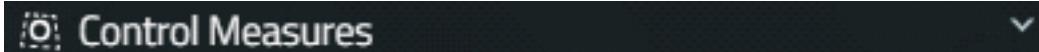
When the mission runs, the built (see [Build Missions \(on page 224\)](#)) VBS4 aircraft entities (see [CAS Units Tool \(on page 108\)](#)) use the CAS NFZ Objects.

5.8.1 Create a CAS NFZ Object

You can create a CAS NFZ Object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and expand **Control Measures** (expanded by default).



i **NOTE**

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Select one of the following NFZ shapes:

i **NOTE**

To stop drawing the object, press **Esc**. This removes the object from the map.

- **Cylinder**



- **Polyhedron**



3. Based on the selected NFZ shape, do one of the following:

- **Cylinder**

Click a position on the map and hold the **LMB**, drag to set the NFZ cylinder size. Release the **LMB** to confirm.

- **Polyhedron**

Click the start and subsequent NFZ positions to define the NFZ polyhedron. Double-click to close the NFZ polyhedron.

 **NOTE**

If the last position is different from the start position, an extra side is added to the NFZ polyhedron.

 **WARNING**

Complex polyhedrons with intersections are invalid. Attempting to draw such a polyhedron results in the shape turning **gray**, in which case, drawing cannot be completed.

The CAS NFZ object appears on the map and is selected.

4. Set the [Global Properties \(on page 140\)](#).

5. Click outside the object.

The CAS NFZ object is created on the map.

To modify the CAS NFZ object, see [Modify a CAS NFZ Object \(below\)](#).

5.8.2 Modify a CAS NFZ Object

You can modify an existing CAS NFZ object.

Click the **Select Tool** and select the CAS NFZ object.

 **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

You can do any of the following:

- In case of an NFZ **polyhedron**, to change the polyhedron shape, do any of the following:

- Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

- To rotate the NFZ shape, do the following:

- a. Click the shape.

NOTE

Make sure not to click the control points.

- b. Click and hold the rotation point, and move the mouse to rotate the shape.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the shape.

- To resize / scale the NFZ shape, do the following:

- a. Click the shape.

NOTE

Make sure not to click the control points.

- b. Drag any of the bounding-box points.



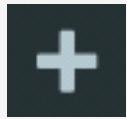
- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(below\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The CAS NFZ object is modified.

5.8.3 CAS NFZ Properties

Set the following CAS NFZ properties.

5.8.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none"> • Enter the stroke number. • Use the up / down arrows to increase / decrease the stroke. • Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Border Color	 Check the Border checkbox, then click the Border icon, and use the Color Palette to select the shape border color.
Color Palette	 You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.   Select to apply the selected border or fill color.  

5.8.3.2 Specific Properties

Specific Property	Description
Text	Text to appear.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
Base Alt.	Object AGL altitude (in meters) in the 3D View.
Width / Length	Object width / length (in meters).
Height	NFZ 3D height (in meters). <div style="border: 2px solid red; padding: 10px; margin-top: 10px;"> WARNING<p>Make sure that the NFZ height is high enough for aircraft not to fly above it.</p></div>
Rotation	Rotation angle (in degrees) to rotate the object.

5.9 CAS No Fire Area (NFA) Tool

Use the No Fire Area (NFA) Tool to designate No Fire Areas on the map for your CAS Unit (see [CAS Units Tool \(on page 108\)](#)).



Do any of the following:

- [Create a CAS NFA Object \(below\)](#)
- [Modify a CAS NFA Object \(on the next page\)](#)

i NOTE

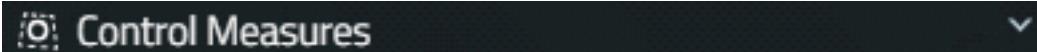
When the mission runs, the built (see [Build Missions \(on page 224\)](#)) VBS4 aircraft entities (see [CAS Units Tool \(on page 108\)](#)) use the CAS NFA Objects.

5.9.1 Create a CAS NFA Object

You can create a CAS NFA Object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and expand **Control Measures** (expanded by default).



i NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Select one of the following NFA shapes:

i NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

- **Cylinder**



- **Polyhedron**



3. Based on the selected NFA shape, do one of the following:

- **Cylinder**

Click a position on the map and hold the **LMB**, drag to set the NFA cylinder size. Release the **LMB** to confirm.

- **Polyhedron**

Click the start and subsequent NFA positions to define the NFA polyhedron. Double-click to close the NFA polyhedron.

 **NOTE**

If the last position is different from the start position, an extra side is added to the NFA polyhedron.

 **WARNING**

Complex polyhedrons with intersections are invalid. Attempting to draw such a polyhedron results in the shape turning **gray**, in which case, drawing cannot be completed.

The CAS NFA object appears on the map and is selected.

4. Set the [Global Properties \(on page 145\)](#).

5. Click outside the object.

The CAS NFA object is created on the map.

To modify the CAS NFA object, see [Modify a CAS NFA Object \(below\)](#).

5.9.2 Modify a CAS NFA Object

You can modify an existing CAS NFA object.

Click the **Select Tool** and select the CAS NFA object.

 **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

You can do any of the following:

- In case of an NFA **Polyhedron**, to change the polyhedron shape, do any of the following:

- Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

- To rotate the NFA shape, do the following:

- a. Click the shape.

NOTE

Make sure not to click the control points.

- b. Click and hold the rotation point, and move the mouse to rotate the shape.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the shape.

- To resize / scale the NFA shape, do the following:

- a. Click the shape.

NOTE

Make sure not to click the control points.

- b. Drag any of the bounding-box points.



- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(below\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The CAS NFA object is modified.

5.9.3 CAS NFA Properties

Set the following CAS NFA properties.

5.9.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">• Enter the stroke number.• Use the up / down arrows to increase / decrease the stroke.• Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Border Color	 Check the Border checkbox, then click the Border icon, and use the Color Palette to select the shape border color.
Color Palette	 You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.   Select to apply the selected border or fill color.  

5.9.3.2 Specific Properties

Specific Property	Description
Text	Text to appear.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Location	Location coordinates. Choose the coordinate type: <ul style="list-style-type: none">• LLMS• MGRS• UTM
Base Alt.	Object AGL altitude (in meters) in the 3D View.
Width / Length	Object width / length (in meters).
Height	NFA 3D height (in meters). <div style="border: 2px solid red; padding: 10px; margin-top: 10px;"> WARNING<p>Make sure that the NFA height is high enough for aircraft not to fire above it.</p></div>
Rotation	Rotation angle (in degrees) to rotate the object.

5.10 CAS Mission Order Tool

Apply a CAS Mission Order to a CAS Unit (see [CAS Units Tool \(on page 108\)](#)) at scenario runtime (Preview / Execute Mode).

NOTE

While it is possible to create CAS Mission Orders in Prepare Mode, some of the CAS Mission Order Tool controls are only available in Preview / Execute Mode, and the intention is to mainly use it at scenario runtime.



In Preview / Execute Mode, the Order execution adds events and missions to the [CAS Event List Panel \(on page 39\)](#) and [CAS Mission List Panel \(on page 38\)](#).

Do any of the following:

- [Create a CAS Mission Order \(below\)](#)
- [Modify a CAS Mission Order \(on the next page\)](#)

5.10.1 Create a CAS Mission Order

You can create a CAS Mission Order.

Follow these steps:

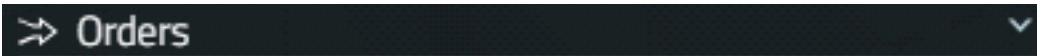
1. Make sure to place at least one FAC / JTAC unit. For more information, see Adding Units in the VBS4 Editor Manual.
2. Make sure you have created the necessary minimum of each of the required CPs / IPs or HAs / BPs, depending on the type of CAS Mission Order. For more information, see [CAS Control Point \(CP\) Tool \(on page 125\)](#), [CAS Initial Point \(IP\) Tool \(on page 128\)](#), [CAS Holding Area \(HA\) Tool \(on page 131\)](#), [CAS Battle Position \(BP\) Tool \(on page 134\)](#).
3. To apply a CAS Mission Order, select an existing CAS Unit on the map.



WARNING

The tool is disabled if no CAS Unit object is selected and built (see [Build Missions \(on page 224\)](#)). For information on how to create a CAS Unit object, see the [CAS Units Tool \(on page 108\)](#).

4. In the [Tools Panel \(on page 23\)](#), select the **CAS** tab, and expand **Orders** (expanded by default).



NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

5. Either click the **CAS Mission Order Tool**, or right-click the **CAS Unit object** and select **Add CAS Mission Order**.



6. Set the CAS Mission Order Specific Properties as described in [Modify a CAS Mission Order \(below\)](#).

NOTE

A grayed out **Mission Orders** panel indicates that either no CAS Unit has been selected or no CAS Mission Order has been created.

The CAS Mission Order is created.

5.10.2 Modify a CAS Mission Order

You can modify an existing CAS Mission Order.

NOTE

The CAS Mission Order auto-saves the modifications.

Click the **Select Tool**.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select a CAS Unit that is assigned a CAS Mission Order you want to modify.

A bounding box appears around the CAS Unit.

In **Routing**, modify the aircraft [Routing Properties \(on page 151\)](#). Click **Advance Now** to start the aircraft routing.

In **Mission Orders**, modify the following **Specific Properties**:

NOTE

Mandatory CAS Mission Order properties are marked with an asterisk (*).

When all of these properties are set, splines (flying trajectories) are added to the map (visible in the 2D and 3D Views).

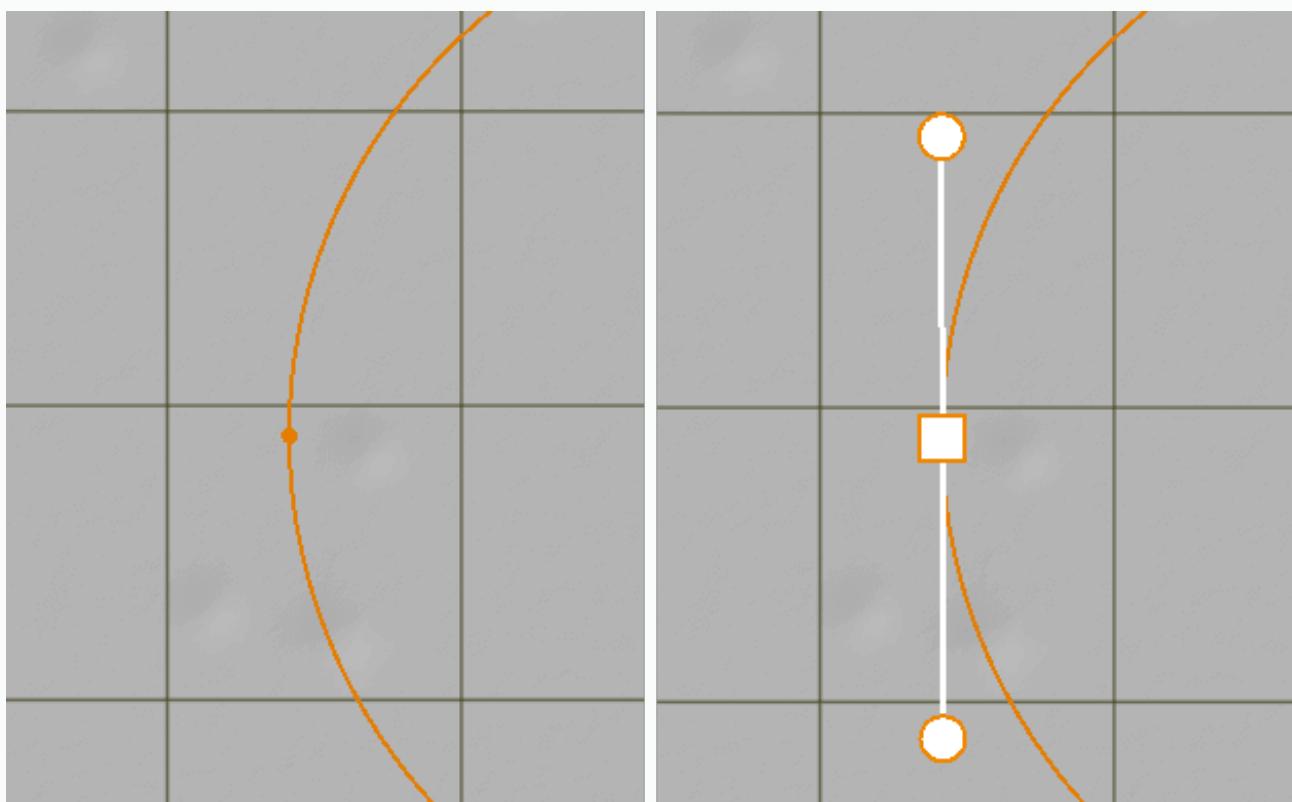
If necessary, click the spline and drag its control points to modify the trajectory.



WARNING

Make sure to place all the CAS Units necessary for the mission, build the mission (see [Build Missions \(on page 224\)](#)) before creating CAS Mission Orders or modifying splines, and not add any other CAS Units afterwards. Otherwise, the CAS mission (including spline delineation) may have unpredictable results.

Image-14: Left to right: spline without and with control points



1. In **Select Aircraft**, select an individual CAS Unit aircraft, assigned a number, for which the steps that follow apply.
2. In **Select Measures**, modify the main [Select Measures Properties \(on page 152\)](#).

3. To add a CAS target reference marker, click **Add Target**.
4. To designate the target, click either a point on the map or a vehicle entity.

**WARNING**

Vehicle entities must be either built using [Build Missions \(on page 224\)](#) or placed using the VBS Editor, before they can be designated as targets.

**TIP**

For better precision when designating targets, press **Map (M)** to switch to the 3D View. This allows you to:

- Designate targets on vertical surfaces of objects (for example, the side of a building).
- Designate vehicle entities (a vehicle unit symbol in the 2D View may not always correspond to the actual vehicle entity).

The New Target dialog opens.

5. Set the [New Target Dialog Properties \(on page 153\)](#).
6. Click **Create**.

The target reference marker appears on the map, and the target information is added under **Target List**.

If required, under **Target List**, modify the [Target Properties \(on page 153\)](#).

7. In **Select Measures**, modify the additional [Select Measures Properties \(on page 152\)](#).
8. In **Select Egress**, modify the [Select Egress Properties \(on page 154\)](#).

The lines between the IP and the target reference marker, and between the latter and the egress IP, become curved based on the egress properties.

9. In **Select Aircraft Details**, modify the [Select Aircraft Details Properties \(on page 155\)](#).
10. In **Select Attack Profile**, modify the [Select Attack Profile Properties \(on page 155\)](#).
11. Go back to the top of **Select Aircraft** to repeat the steps for other aircraft in your CAS Unit.

12. In **Execution Control**, choose one of the following:

 **NOTE**

The **Execution Control** section is only available in Preview / Execute Mode.

- To start the CAS mission, click **Start CAS Mission**.
The CAS mission starts.
- To abort the started CAS mission, click **Abort Mission**.
The CAS mission aborts.
- To begin the attack, based on the Cleared Hot clearance call from the JTAC, click **Cleared Hot**.
The CAS Unit begins the attack.

The CAS Mission Order is modified.

5.10.3 CAS Mission Order Properties

Set the following CAS Mission Order properties.

5.10.3.1 Specific Properties

Routing Properties

 **WARNING**

CAS properties marked with an asterisk (*) are mandatory.

Specific Property	Description
Route To*	Available CPs, IPs, HAs, and BPs, based on the values in the drop-down.
Coordinates	Routing coordinates. You can also select Stay Above or Stay Below in feet or meters, to stay above / below the specified altitude.

 **NOTE**

The following considerations apply:

- If both **Stay Above** and **Stay Below** are specified, their average is used.
- If both **Stay Above** and **Stay Below** are specified, and are mutually exclusive, the default aircraft altitude is used instead.

Pattern	Holding pattern. Can be: <ul style="list-style-type: none"> • Race Track / Lines • Wheel Orbit • Hover
Radius	Pattern radius in Nautical Miles (NM). <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> i NOTE The minimum is 1 NM. </div>

Select Measures Properties

Main:

Specific Property	Description
Observer	Available JTAC playable units with a URN, based on the values in the drop-down. <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> i NOTE Cannot be specified in Prepare Mode. </div>
Control Type	CAS mission control type. Can be: <ul style="list-style-type: none"> • Type 1 - Type 1 control is used when the FAC / JTAC requires control of individual attacks and the situation requires the FAC / JTAC to visually acquire the attacking aircraft and visually acquire the target for each attack. • Type 2 - Type 2 control is used when the FAC / JTAC requires control of individual attacks and is unable to visually acquire the attacking aircraft at weapons release or is unable to visually acquire the target. • Type 3 - Type 3 control is used when the FAC / JTAC requires the ability to provide clearance for multiple attacks within a single engagement subject to specific attack restrictions. <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> i NOTE The following rules apply: <ul style="list-style-type: none"> • The JTAC has to correctly identify the CAS mission type they are requesting. • The Instructor has to record the CAS mission type requested by the JTAC. </div>
Initial Point	Available IPs based on the values in the drop-down.
Heading / Distance	Heading (in degrees) and distance (in mils) to approach the CAS target.

Additional:

Specific Property	Description
Mark Type	CAS Mission Order mark type. Can be: <ul style="list-style-type: none"> • None • Smoke • Laser Set the mark Laser Code , which is the Pulse Repetition Frequency (PRF), and LTL (Laser Target Line) angle in degrees.
Friendly Location	Friendly forces location, indicated by the direction (NW, N, NE, E, SE, S, SW, W) and distance (in meters).

New Target Dialog Properties



WARNING

CAS properties marked with an asterisk (*) are mandatory.

Specific Property	Description
Name*	Target name.
Type*	Target type (auto-selected, depending on target designation). Can be: <ul style="list-style-type: none"> • Point - Geo-referenced position or GPS target coordinates. • Object - Moving target. <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> NOTE Only shows for vehicle entities, designated as targets. </div>
Location*	Target coordinates in LLMS, MGRS, or UTM. <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> NOTE Not all the coordinate types from the Coordinates Type Global Property (see Global Properties (on page 238) in the VBS Plan Manual) can be used for the target coordinates. </div>

Target Properties

To delete an existing target, either select the target reference marker on the map and press **Delete**, or click the **Trash Icon** in the target entry under **Target List**.



WARNING

CAS properties marked with an asterisk (*) are mandatory.

Specific Property	Description
Name*	Target name.
Type*	Target type (auto-selected, depending on target designation). Can be: <ul style="list-style-type: none"> Point - Geo-referenced position or GPS target coordinates. Object - Moving target. <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;">  NOTE Only shows for vehicle entities, designated as targets. </div>
Target Coordinates*	Target coordinates in LLMS, MGRS, or UTM.
Target Elevation*	Target elevation (in feet or meters) above sea level.

Select Egress Properties

Specific Property	Description
Egress Direction	Egress direction based on the direction grid (click the required direction tile - NW, N, NE, E, SE, S, SW, W). Egress Direction is optional and is followed for a distance of 2 km, before heading towards the Egress Location .
Egress Location	Egress location based on the values available in the drop-down. Egress location can either be specified using an existing CP or IP. Or if omitted, the last known CP / HA of the CAS Unit is used by default. It is assumed that all the CAS Unit aircraft have at least one known CP / HA, even if none is specified by the user, as it is the location where the CAS Unit spawns in the mission.

Select Aircraft Details Properties

Specific Property	Description
Engage	<p>Engagement type. Can be:</p> <ul style="list-style-type: none">• Immediate - Default setting. The CAS mission starts as soon as you click Start CAS Mission.• Time On Target - The CAS mission starts with a delay, timed so that the (first, if multiple) projectile impacts at the specified mission time.• Time To Target - The CAS mission starts with a delay, timed so that the (first, if multiple) projectile impacts at the specified time from when you click Start CAS Mission. For example, with a Time To Target of 5 minutes, the projectile impacts 5 minutes after you click Start CAS Mission. <p>If you select Time On Target or Time To Target, you also need to set the time in the fields that appear.</p> <div style="border: 1px solid red; padding: 10px;"><p> WARNING If the timing is set too early, the CAS mission starts immediately.</p></div> <div style="border: 1px solid #0070C0; padding: 10px; background-color: #e0f2fd;"><p> NOTE Time On Target is set in relation to the Elapsed Time / Mission Time. For more information, see Synchronize Time in the VBS4 Editor Manual.</p></div>

Select Attack Profile Properties

Specific Property	Description
Separation	Attack separation (in seconds).
Altitude	Attack altitude (in feet or meters).

Attack Profile*

Attack profile. Can be:

- Level
- Orbit
- Pop Up
- Dive

NOTE

An aircraft performing an Orbit attack can only engage one target per CAS mission.

WARNING

In case of insufficient attack distance and / or altitude, the "Not Able to Fire" error message is displayed.

TIP

You can also calibrate the `maxDiveAngle` in the aircraft or optimal firing distances in the munition JSON configuration (see [CAS Unit Parameters \(on page 113\)](#)) to enable dive attacks.

Munitions*

Munition type based on the values available in the drop-down.

Set the munitions **Quantity** and **Beaten Zone** (used by unguided munitions, and represents a line, measured in meters, along which munitions are dropped in equidistant manner).

Selecting the munition adds Risk-Estimate Distance Rings (REDs) to the map, which indicate the damage area for the chosen munition.

TIP

You can show / hide REDs using the [CAS Available Aircraft Tool \(on page 123\)](#).

6. Drawing Objects

The VBS Plan UI provides a set of Drawing tools to annotate 2D and 3D views with objects / shapes.

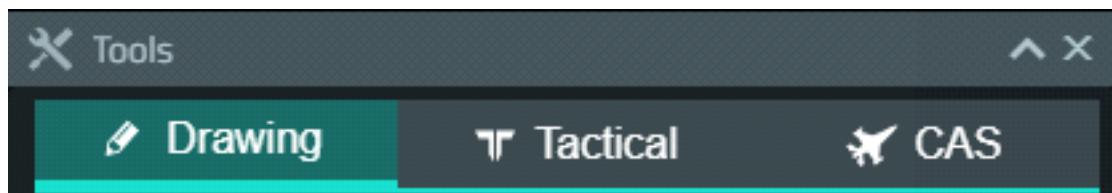
The Drawing Objects appear in:

- VBS Plan (Prepare / Execute Mode)
- VBS Editor (Prepare / Execute Mode)
- C2 (Execute Mode)
- AAR (Assess Mode)

The Drawing tools are located in the [Tools Panel \(on page 23\)](#), and each drawing tool has overlay properties (see the [Properties Reference \(on page 238\)](#)). Once the overlays are drawn, you can manage them (see [Managing Overlays \(on page 211\)](#)).

In addition, you can create your own custom symbols / shapes, and store them in the [Symbol Library \(on page 208\)](#).

In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.



Select the Drawing tool you want to use:

Drawing Tool	Icon	Description
Select Tool		Used to select overlay objects.
Line Tool		Used to draw straight lines. To use the tool, see Line Tool (on page 160) .
Freedraw Tool		Used for freehand drawing. To use the tool, see Freedraw Tool (on page 165) .

Drawing Tool	Icon	Description
Text Tool		Used to draw a user-specified text. To use the tool, see Text Tool (on page 168) .
Grid Tool		Used to draw a grid. To use the tool, see Grid Tool (on page 171) .
Unit Symbol Tool		Used to draw a MIL-2525C unit symbol. To use the tool, see Unit Symbol Tool (on page 175) .
2D Objects Tools		Used to draw any of the following 2D shapes: <ul style="list-style-type: none"> • Irregular 2D Shape • Rectangle • Square • Ellipse • Circle • Polygon Expand 2D Objects (expanded by default): To use the tools, see 2D Objects Tools (on page 179) .
3D Objects Tools		Used to draw any of the following 3D shapes: <ul style="list-style-type: none"> • Cuboid • Cube • Air Corridor • Cylinder • Prism Expand 3D Objects (expanded by default): To use the tool, see 3D Objects Tools (on page 189) .
Control Measures Tools		The following control measure drawings are available: <ul style="list-style-type: none"> • Assembly Area • Engagement Area • Friendly Area • Named Area of Interest • Target Area of Interest • Decision Point • Observation Post Expand Control Measures (expanded by default): For the Area control measures, see Area Tool (on page 195) . For Decision Point, see Decision Point Tool (on page 200) . For Observation Post, see Observation Post Tool (on page 204) .

Follow these steps:

1. Make sure that the [Global Properties \(on page 238\)](#) and [Specific Properties \(on page 240\)](#) of the selected tool are set.
2. Draw an object using the tool.

NOTE

The object is added to the selected overlay. For more information, see the [Managing Overlays \(on page 211\)](#).

3. If necessary, modify the existing object size / shape / location and [Specific Properties \(on page 240\)](#).

TIP

Some tools enable you to delete control points to modify the shape of an object.



The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

4. Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo object modification actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

NOTE

The bounding box does not exactly update its size to encapsulate objects when undo / redo is used. This does not affect functionality.

6.1 Line Tool

Use the Line Tool to draw one or more straight lines.



Do any of the following:

- [Create a Line Object \(below\)](#)
- [Modify a Line Object \(on the next page\)](#)

6.1.1 Create a Line Object

You can create a Line object, which represents various types of line, such as obstacles and boundary markers, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **Line Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Set the [Global Properties \(on page 162\)](#).
4. Set the [Specific Properties \(on page 162\)](#), based on the line type.
5. Click a position on the map to start a line.
6. Click a position on the map to extend the line. Repeat as many times as required.
7. Double-click to finish drawing the line.

The Line object appears on the map, showing the control points.

8. Click outside the shape.

The Line object is created on the map.

To modify the Line object, see [Modify a Line Object \(below\)](#).

6.1.2 Modify a Line Object

You can modify an existing Line object.

Follow these steps:

1. Click the **Select Tool** and select the Line object.

i **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. You can do any of the following:

- To change the shape, do any of the following:
 - Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

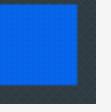
- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#), based on the line type.
- Delete the object by pressing **Delete**.

The Line object is modified.

6.1.3 Line Properties

Set the following Line properties.

6.1.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none"> Enter the stroke number. Use the up / down arrows to increase / decrease the stroke. Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Color Palette	 <p>You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.</p>     <p>Select to apply the selected border or fill color.</p>

6.1.3.2 Specific Properties

Properties before placement:

General:

Specific Property	Description
Line Type	Line type. Can be: <ul style="list-style-type: none"> Default (basic line). Line Obstacles (used to designate obstacles). Boundary Markers (used to designate boundary markers).
Font	Font family / type.
Font Size	Font size.

Render Text on Surface	Select to snap the text to the same plane as the ground.
-------------------------------	--

For the **Default** line type:

Specific Property	Description
Stroke Type	Line stroke type based on the values illustrated in the drop-down: <ul style="list-style-type: none">• Solid• Dashed• Dotted• Dot-dash• Round-dot• Border• Feba• Feba 2• Flot 1• Flot 2• Flot 3• Notched• Railroad• Wire• ZigZag
Arrowheads	Arrow head type, at arrow start and end. Use the graphic types illustrated in the Start and End drop-downs.
Text	Text to appear.

For the **Line Obstacles** line type:

Specific Property	Description
Obstacles Type	Obstacle type based on the drop-down values: <ul style="list-style-type: none">• Surface• Water• Other
Marker Type	Obstacle marker type based on the values illustrated in the drop-down: <ul style="list-style-type: none">• Tanks slow go• Armed vehicles slow go• Tanks no go• Armed vehicle no go• Tanks no go / slow go• Armed vehicles no go / slow go• Steep edge (high / low)• Buried obstacle• Incremented obstacle
Text	Text to appear.

For the **Boundary Markers** line type:

Specific Property	Description
-------------------	-------------

Marker Type	Boundary marker type based on the values illustrated in the drop-down:		
	• Team / Crew	• Battalion	• Corps
	• Squad	• Regiment	• Army
	• Section	• Brigade	• Army Group
	• Platoon	• Division	• Theater
	• Company		
Marker Text (A / B)	First (A) and second (B) marker text to appear on the line.		
Align Text Horizontally	Check this to align the text horizontally in 3D.		

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

6.2 Freedraw Tool

Use the Freedraw Tool to create freehand drawings on the map.



Do any of the following:

- [Create a Freedraw Object \(below\)](#)
- [Modify a Freedraw Object \(on the next page\)](#)

6.2.1 Create a Freedraw Object

You can create a Freedraw Object, which represents a freehand drawing on the map, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

 **NOTE**

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **Freedraw Tool**.



 **NOTE**

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Set the [Global Properties \(on the next page\)](#).
4. Set the [Specific Properties \(on page 167\)](#).
5. Click and hold the **LMB** to draw a freehand line. Release the **LMB** to finish drawing the line.
The Freedraw object appears on the map, showing the control points.
6. Click outside the shape.

The Freedraw object is created on the map.

To modify the Freedraw object, see [Modify a Freedraw Object \(on the next page\)](#).

6.2.2 Modify a Freedraw Object

You can modify an existing Freedraw object.

Follow these steps:

1. Click the **Select Tool** and select the Freedraw object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. Do any of the following:

- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(below\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The Freedraw object is modified.

6.2.3 Freedraw Properties

Set the following Freedraw properties.

6.2.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">• Enter the stroke number.• Use the up / down arrows to increase / decrease the stroke.• Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.

Color Palette

You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the **Saved Colors** list.



Select to apply the selected border or fill color.



6.2.3.2 Specific Properties

Properties before placement:

Specific Property	Description
Stroke Type	Freedraw stroke type based on the values illustrated in the drop-down: <ul style="list-style-type: none"> • Solid • Dashed • Dotted • Dot-dash • Round-dot
Text	Text to appear.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

6.3 Text Tool

You can annotate the map with text.



Do any of the following:

- [Create a Text Object \(below\)](#)
- [Modify a Text Object \(on the next page\)](#)

6.3.1 Create a Text Object

You can create a Text object, which represents any text on the map, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

 **NOTE**

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **Text Tool**.



 **NOTE**

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Set the [Global Properties \(on page 170\)](#).
4. Set the [Specific Properties \(on page 170\)](#).
5. Click a location on the map for the text to appear at.
6. Type the text.
7. Press **Enter** to confirm.

The Text object is created on the map.

To modify the Text object, see [Modify a Text Object \(on the next page\)](#).

6.3.2 Modify a Text Object

You can modify an existing Text object.

Follow these steps:

1. Click the **Select Tool**.

i **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. Select the object by clicking the text.

A bounding box appears around the Text object.

i **NOTE**

The bounding-box points are disabled, as it is not possible to use them to resize a Text object.

3. You can do any of the following:

- To rotate the shape, do the following:
 - a. Click the shape.
 - b. Click and hold the rotation point, and move the mouse to rotate the shape.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the shape.

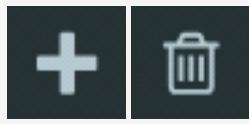
- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The Text object is modified.

6.3.3 Text Properties

Set the following Text properties.

6.3.3.1 Global Properties

Global Property	Description
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Color Palette	 <p>You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.</p>  <p>Select to apply the selected border or fill color.</p> 

6.3.3.2 Specific Properties

Properties before placement:

Specific Property	Description
Text	Text to appear.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Base Alt.	Object AGL altitude (in meters) in the 3D View.
Rotation	Rotation angle (in degrees) to rotate the object.

6.4 Grid Tool

You can create a grid on the map.



Do any of the following:

- [Create a Grid Object \(below\)](#)
- [Modify a Grid Object \(on the next page\)](#)

6.4.1 Create a Grid Object

You can create a Grid object, which represents a 2D grid on the map, visible in 2D / 3D.

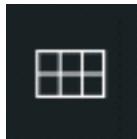
Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **Grid Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Set the [Global Properties \(on page 173\)](#).
4. Set the [Specific Properties \(on page 173\)](#).
5. Click a position on the map and hold the **LMB**, drag to set the grid size. Release the **LMB** to confirm.

The Grid object appears on the map, showing the control points.

6. Click outside the shape.

The Grid object is created on the map.

To modify the Grid object, see [Modify a Grid Object \(on the next page\)](#).

6.4.2 Modify a Grid Object

You can modify an existing Grid object.

Follow these steps:

1. Click the **Select Tool** and select the Grid object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. You can do any of the following:

- To resize / scale the Grid object, do the following:
 - a. Drag any of the control points.



- b. Click outside the object area, to confirm the new size / scale.

NOTE

The bounding-box points are disabled, as it is not possible to use them to resize a Grid object.

- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The Grid object is modified.

6.4.3 Grid Properties

Set the following Grid properties.

6.4.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none"> Enter the stroke number. Use the up / down arrows to increase / decrease the stroke. Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Color Palette	 <p>You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.</p>     <p>Select to apply the selected border or fill color.</p>

6.4.3.2 Specific Properties

Properties before placement:

Specific Property	Description
Cell Size	Grid cell size (in meters).
Divide Cells	Grid cell subdivision based on the values in the drop-down: <ul style="list-style-type: none"> None Keypad (9) Keypad (9), Intercardinal (4)
Start At	Grid row and column to start at.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

6.5 Unit Symbol Tool

You can create unit symbols on the map.



i NOTE

The following considerations apply:

- The Unit Symbol Object, created using the Unit Symbol Tool, is not the same as a Tactical Unit Object (see [Units Tool \(on page 57\)](#)). The former is only a symbol drawn on the map, while the latter can be built into unit entities (see [Build Missions \(on page 224\)](#)).
- The Unit Symbol Tool relies on the ORBAT (Order of Battle) definitions that can be created / modified using the ORBAT Editor (see ORBAT Editor in the VBS4 Editor Manual).

Do any of the following:

- [Create a Unit Symbol Object \(below\)](#)
- [Modify a Unit Symbol Object \(on page 177\)](#)

6.5.1 Create a Unit Symbol Object

You can create a Unit Symbol object, based on the MIL-STD-2525C doctrine, visible in 2D / 3D.

i NOTE

In a group command structure, only the highest echelon symbology is displayed.

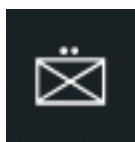
Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

i NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Click the **Unit Symbol Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

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

Unit Symbols					
Affiliation	Battle Dimension	Status	Size	Function ID	Symbol Preview
Friend Hostile Unknown Pending ...more	Ground Unit Ground Equip... Ground Instal... Space Air ...more	Present Planned ...more	Unspecified Team/Crew Squad Section Platoon/D... Company/... Battalion/S... Regiment/... Brigade ...more	Search Unmanned Aircr... Unmanned Aircr... Unmanned Aircr... Infantry Infantry Light Infantry Motoriz... Infantry Mountain Infantry Airborne Infantry Air Ass... Infantry Mechan... ...more	 SIDC SFGPUCI----A Unique Designation Higher Formation

3. Select the symbol **Affiliation**, **Battle Dimension**, **Status**, **Size**, **Function ID**, based on the available values in each column (click **... more** to expand the list in each column).

TIP

You can enter the Function ID name in the **Type to Search** field of the **Function ID** column.

4. Enter the **SIDC** (Symbol Identification Coding), **Unique Designation**, and **Higher Formation**.
5. Click **Place**.
6. Click a position on the map to place the symbol.

The Unit Symbol object is created on the map.

To modify the Unit Symbol object, see [Modify a Unit Symbol Object \(on the next page\)](#).

6.5.2 Modify a Unit Symbol Object

You can modify an existing Unit Symbol object.

Follow these steps:

1. Click the **Select Tool**.

i **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. Select the object by clicking it.

A bounding box appears around the Unit Symbol object.

i **NOTE**

The bounding-box points are disabled, as it is not possible to use them to resize a Unit Symbol object.

3. You can do any of the following:

- Drag the object to relocate it to a different position on the map.
- Modify the [Specific Properties \(below\)](#).
- Delete the object by pressing **Delete**.

The Unit Symbol object is modified.

6.5.2.1 Unit Symbol Properties

Set the following Unit Symbol properties.

6.5.2.2 Specific Properties

Specific Property	Description
Symbol Outline	Unit Symbol outline frame width (in pt).
Fill	Unit Symbol fill hue / color mode based on the values in the drop-down.
Unique Designation	Text modifier for units, equipment, and installations, which uniquely identifies a particular symbol or track number.

Higher Formation	Text modifier for units that indicates a number or a title of higher-echelon command.
Location Description	Description of the location.
Altitude Description	Altitude information.
Reinf./Red.	Text modifier for a unit symbol, indicating whether the unit is reinforced.
Staff Comments	Custom text modifier for units, equipment, and installations.
SIDC	Unit symbol SIDC.
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

6.6 2D Objects Tools

You can create one of the following geometric 2D shapes:



- Irregular 2D Shape
- Rectangle
- Square
- Ellipse
- Circle
- Polygon

Each of these 2D shapes is represented by a tool.

For how to create and modify 2D Shape objects, see:

- [Create a 2D Shape Object \(below\)](#)
- [Modify a 2D Shape Object \(on the next page\)](#)

6.6.1 Create a 2D Shape Object

You can create a 2D Shape object, representing a predefined 2D shape, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **2D Objects** (expanded by default) and select any of the shape tools:



- Irregular 2D Shape
- Rectangle
- Square

- Ellipse
- Circle
- Polygon

NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

3. To create an Irregular 2D Shape, see [Irregular 2D Shape Tool \(on page 184\)](#).

To create other 2D Shapes:

- a. Set the [Global Properties \(on the next page\)](#).
- b. In the case of a Polygon, set the [Specific Properties \(on page 183\)](#).
- c. Click a position on the map and hold the **LMB**, drag to set the shape size. Release the **LMB** to confirm.
- d. The 2D Shape object appears on the map and is selected.
- e. Click outside the shape.

The 2D Shape object is created on the map.

To modify the 2D Shape object, see [Modify a 2D Shape Object \(below\)](#).

6.6.2 Modify a 2D Shape Object

You can modify an existing 2D Shape object.

Click the **Select Tool**.

i NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

Select the object by clicking it.

A bounding box appears around the 2D Shape object.

For Irregular 2D Shapes, see [Modify an Irregular 2D Shape Object \(on page 185\)](#).

For other 2D Shapes, do any of the following:

- Click and hold the rotation point, and move the mouse to rotate the shape.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the shape.

- Drag any of the bounding-box points to change the shape size.



- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(below\)](#).
- Modify the [Specific Properties \(on page 183\)](#).
- Delete the object by pressing **Delete**.

The 2D Shape object is modified.

6.6.3 2D Shape Properties

Set the following 2D Shape properties.

6.6.3.1 Global Properties

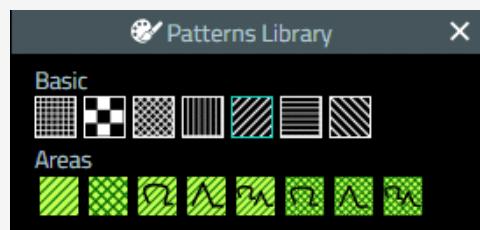
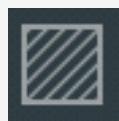
Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">• Enter the stroke number.• Use the up / down arrows to increase / decrease the stroke.• Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Border Color	 Check the Border checkbox, then click the Border icon, and use the Color Palette to select the shape border color.

Color Palette

You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the **Saved Colors** list.



Select to apply the selected border or fill color.

**Patterns Library**

A library of patterns for filling shapes (designated by the Pattern icon).

The Basic fill patterns are:

- Grid Pattern
- Chessboard Pattern
- Grid Pattern 45°
- Line Pattern
- Line Pattern 45°
- Line Pattern 90°
- Line Pattern 315°

The Area fill patterns are:

- Bottom slow go
- Bottom no go
- Deciduous forest slow go
- Coniferous forest slow go
- Mixed forest slow go
- Deciduous forest no go
- Coniferous forest no go
- Mixed forest no go

Check the Pattern checkbox, then click the Pattern icon, and use the Patterns Library to select the pattern (basic or area).

**Pattern Scale**

Pattern scale. Do any of the following:

- Enter the scale number.
- Use the up / down arrows to increase / decrease the scale.
- Use the drop-down to select one of the preset values.

6.6.3.2 Specific Properties

Properties before placement:

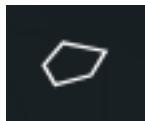
Specific Property	Description
Text	Text to appear.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Sides	Number of polygon / prism sides.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Width / Length	Object width / length (in meters).
Rotation	Rotation angle (in degrees) to rotate the object.

6.6.4 Irregular 2D Shape Tool

Use the Irregular 2D Shape Tool to draw irregular 2D polygons.



Do any of the following:

- [Create an Irregular 2D Shape Object \(below\)](#)
- [Modify an Irregular 2D Shape Object \(on the next page\)](#)

6.6.4.1 Create an Irregular 2D Shape Object

You can create an Irregular 2D Shape object, which represents an irregular 2D polygon shape on the map, and is also visible on the terrain (in 3D).

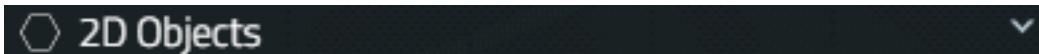
Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

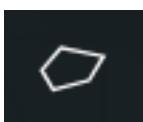
NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **2D Objects** (expanded by default).



3. Click the **Irregular 2D Shape Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Set the [Global Properties \(on page 187\)](#).

- Click the start and subsequent positions to define the shape of the irregular polygon. Double-click to close the polygon.

NOTE

If the last position is different from the start position, an extra side is added to the irregular polygon.

WARNING

Complex polygons with intersections are invalid. Attempting to draw such a polygon results in the shape turning **gray**, in which case, drawing cannot be completed.

The Irregular 2D Shape object appears on the map, showing the control points.

- Click outside the shape.

The Irregular 2D Shape object is created on the map.

To modify the Irregular 2D Shape object, see [Modify an Irregular 2D Shape Object \(below\)](#).

6.6.4.2 Modify an Irregular 2D Shape Object

You can modify an existing Irregular 2D Shape object.

Click the **Select Tool** and select the Irregular 2D Shape object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

To change the shape, do any of the following:

- Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

WARNING

Removing control points from Irregular 2D Shape objects can cause them to be invalid (grayed-out).

To rotate the shape, do the following:

1. Click the shape.

NOTE

Make sure not to click the control points.

2. Click and hold the rotation point, and move the mouse to rotate the shape.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the shape.

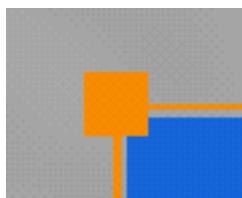
To resize / scale the shape, do the following:

1. Click the shape.

NOTE

Make sure not to click the control points.

2. Drag any of the bounding-box points.



Drag the object to relocate it to a different position on the map.

Modify the [Global Properties \(on the next page\)](#).

Modify the [Specific Properties \(on page 188\)](#).

Delete the object by pressing **Delete**.

The Irregular 2D Shape object is modified.

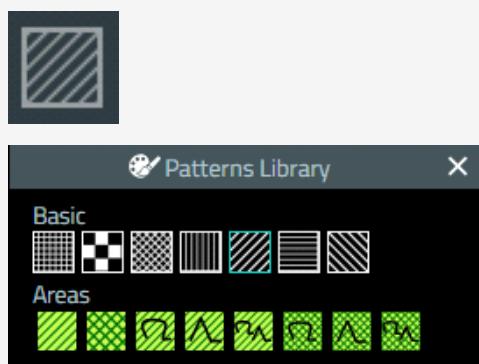
6.6.4.3 Irregular 2D Shape Properties

Set the following Irregular 2D Shape properties.

6.6.4.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">Enter the stroke number.Use the up / down arrows to increase / decrease the stroke.Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Border Color	 Check the Border checkbox, then click the Border icon, and use the Color Palette to select the shape border color.
Color Palette	 <p>You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.</p>   <p>Select to apply the selected border or fill color.</p>  

Patterns Library



A library of patterns for filling shapes (designated by the Pattern icon).

The Basic fill patterns are:

- Grid Pattern
- Chessboard Pattern
- Grid Pattern 45°
- Line Pattern
- Line Pattern 45°
- Line Pattern 90°
- Line Pattern 315°

The Area fill patterns are:

- Bottom slow go
- Bottom no go
- Deciduous forest slow go
- Coniferous forest slow go
- Mixed forest slow go
- Deciduous forest no go
- Coniferous forest no go
- Mixed forest no go

Check the Pattern checkbox, then click the Pattern icon, and use the Patterns Library to select the pattern (basic or area).



Pattern Scale

Pattern scale. Do any of the following:

- Enter the scale number.
- Use the up / down arrows to increase / decrease the scale.
- Use the drop-down to select one of the preset values.

6.6.4.3.2 Specific Properties

Specific Property	Description
Text	Text to appear.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Width / Length	Object width / length (in meters).
Rotation	Rotation angle (in degrees) to rotate the object.

6.7 3D Objects Tools

You can create one of the following geometric 3D shapes:

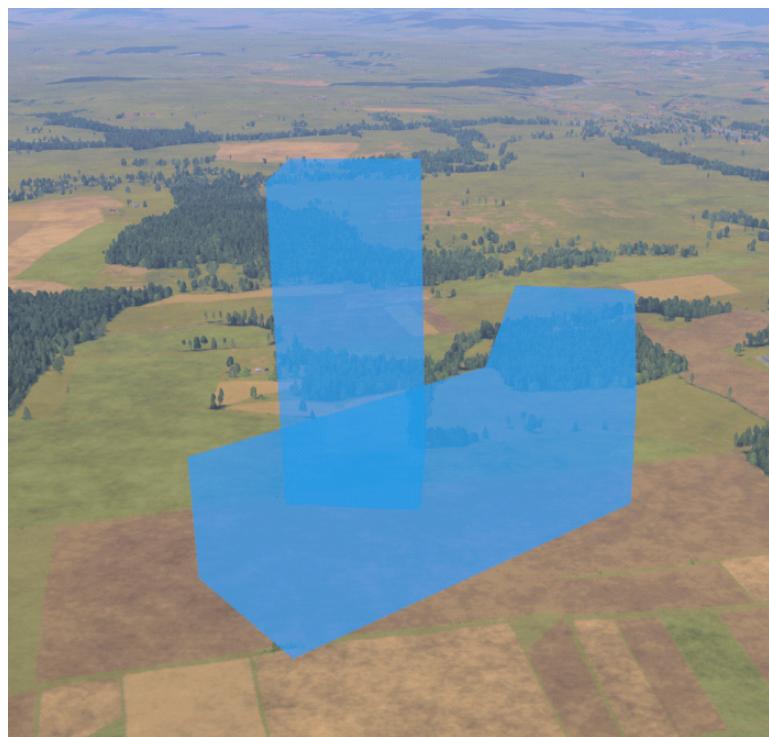
3D Objects

- Cuboid
- Cube
- Air Corridor
- Cylinder
- Prism

Each of these 3D shapes is represented by a tool.

Air Corridor relies on ASL positioning, while all the other 3D shapes rely on AGL positioning. For example, if you place an Air Corridor and a Cuboid that are 100m high, they do not appear aligned in 3D.

Image-15: ASL - AGL height difference



To create and modify a 3D Shape object, see:

- [Create a 3D Shape Object \(on the next page\)](#)
- [Modify a 3D Shape Object \(on page 191\)](#)

6.7.1 Create a 3D Shape Object

You can create a 3D Shape object, which represents any of the predefined 3D shapes, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

i **NOTE**

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **3D Objects** (expanded by default), and select a shape tool:



- **Cuboid**
- **Cube**
- **Air Corridor**

- **Cylinder**
- **Prism**

i **NOTE**

To stop drawing the object, press **Esc**. This removes the object from the map.

3. Set the [Global Properties \(on page 193\)](#).
4. Set the [Specific Properties \(on page 193\)](#), based on the selected 3D shape.

5. Do one of the following:

- For **Air Corridor**, do the following:
 - a. Click a position on the map, where you want the air corridor to start.
 - b. Click a position on the map, where you want the air corridor to change direction.
Repeat this step for as many line segments as needed.
 - c. Double-click to finish drawing the air corridor.



WARNING

The default Air Corridor placement is in ASL, which may result in it being sunk in the terrain. To finish the Air Corridor shape, you have to select and modify it using the **Specific Properties**. To do so, see [Modify a 3D Shape Object \(below\)](#).

- For all the other 3D shapes, click a position on the map and hold the **LMB**, drag to set the shape size. Release the **LMB** to confirm.

The 3D Shape object appears on the map and is selected.

6. Click outside the shape.

The 3D Shape object is created on the map.

To modify the 3D Shape object, see [Modify a 3D Shape Object \(below\)](#).

6.7.2 Modify a 3D Shape Object

You can modify an existing 3D Shape object.

Click the **Select Tool** and select the 3D Shape object.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

For **Air Corridor**, to change the shape, do the following:

1. Click any of the control points, and do any of the following:

- Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).
- In **Control Points Properties**, modify the relevant [Specific Properties \(on the next page\)](#).

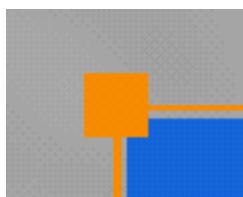
2. Click outside the object area, to confirm the new shape.

To rotate the shape, click and hold the rotation point, and move the mouse to rotate the shape



Alternatively, hold **Shift + RMB** and move the mouse to rotate the shape.

To resize / scale the shape, drag any of the bounding-box points.



Drag the object to relocate it to a different position on the map.

Modify the [Global Properties \(on the next page\)](#).

Modify the [Specific Properties \(on the next page\)](#), depending on the 3D shape.

Delete the object by pressing **Delete**.

The 3D Shape object is modified.

6.7.3 3D Shape Properties

Set the following 3D Shape properties.

6.7.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none"> Enter the stroke number. Use the up / down arrows to increase / decrease the stroke. Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Border Color	 Check the Border checkbox, then click the Border icon, and use the Color Palette to select the shape border color.
Color Palette	 <p>You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.</p>   <p>Select to apply the selected border or fill color.</p>  

6.7.3.2 Specific Properties

Properties before placement:

Specific Property	Description
Text	Text to appear.
Font	Font family / type.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

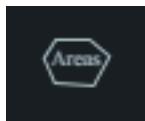
Sides	Number of polygon / prism sides.
Width / Height	Object width / height (in meters).

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Base Alt.	Object AGL altitude (in meters) in the 3D View.
Width / Length	Object width / length (in meters).
Height	3D shape height (in meters).
Rotation	Rotation angle (in degrees) to rotate the object.

6.8 Area Tool

You can designate areas on the map that serve a certain purpose.



The following area types are supported:

- Friendly Area
- Named Area of Interest
- Target Area of Interest
- Assembly Area
- Assault Position

Do any of the following:

- [Create an Area Object \(below\)](#)
- [Modify an Area Object \(on the next page\)](#)

6.8.1 Create an Area Object

You can create an Area object, visible in 2D / 3D.

Follow these steps:

1. In the Tools Panel (on page 23), select the **Drawing** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **Control Measures** (expanded by default).



3. Click the **Area Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Set the [Global Properties \(on page 198\)](#).
5. Set the [Specific Properties \(on page 198\)](#).
6. Click the start and subsequent positions to define the area shape. Double-click to close the shape.

NOTE

If the last position is different from the start position, an extra side is added to the shape.

The Area object appears on the map and is selected.

7. Click outside the shape.

The Area object is created on the map.

To the Area object, see [Modify an Area Object \(below\)](#).

6.8.2 Modify an Area Object

You can modify an Area object.

Click the **Select Tool**.

NOTE

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

To change the shape, do any of the following:

- Drag any of the control points, and click outside the object to confirm.



- Delete any of the control points.

The object updates itself automatically by creating a line, using the shortest path possible, between the control points on either side of the deleted one.

- Use **LCtrl + Y / LCtrl + Z (Undo / Redo)** to undo / redo either of the aforementioned control points actions (see also [Share Overlays - Considerations \(on page 216\)](#)).

To rotate the shape, do the following:

1. Click the shape.

 **NOTE**

Make sure not to click the control points.

2. Click and hold the rotation point, and move the mouse to rotate the shape.



Alternatively, hold **Shift + RMB** and move the mouse to rotate the shape.

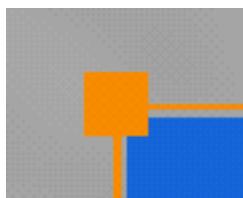
To resize / scale the shape, do the following:

- a. Click the shape.

 **NOTE**

Make sure not to click the control points.

- b. Drag any of the bounding-box points.



Drag the object to relocate it to a different position on the map.

Modify the [Global Properties \(on the next page\)](#).

Modify the [Specific Properties \(on the next page\)](#).

Delete the object by pressing **Delete**.

The Area object is modified.

6.8.3 Area Properties

Set the following Area properties.

6.8.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none"> Enter the stroke number. Use the up / down arrows to increase / decrease the stroke. Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Color Palette	 <p>You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.</p>   <p>Select to apply the selected border or fill color.</p>  

6.8.3.2 Specific Properties

Properties before placement:

Specific Property	Description
Area Type	Area type based on the values available in the drop-down: <ul style="list-style-type: none"> Friendly Area Named Area of Interest Target Area of Interest Assembly Area Assault Position
Unique Designation	Area name.
Font Size	Font size.

Render Text on Surface	Select to snap the text to the same plane as the ground.
-------------------------------	--

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).
Width / Length	Object width / length (in meters).
Rotation	Rotation angle (in degrees) to rotate the object.

6.9 Decision Point Tool

You can designate points on the map, where commanders need to make decisions concerning a specific course of action.



Do any of the following:

- [Create a Decision Point Object \(below\)](#)
- [Modify a Decision Point Object \(on the next page\)](#)

6.9.1 Create a Decision Point Object

You can create a Decision Point object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **Control Measures** (expanded by default).



3. Click the **Decision Point Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Set the [Global Properties \(on page 202\)](#).
5. Set the [Specific Properties \(on page 202\)](#).
6. Click a position on the map, where you want to designate a decision point, while holding the **LMB**, and drag the mouse to set the decision point size. Release the **LMB** to set the size.
The Decision Point object appears on the map and is selected.
7. Click outside the shape.

The Decision Point object is created on the map.

To modify the Decision Point object, see [Modify a Decision Point Object \(below\)](#).

6.9.2 Modify a Decision Point Object

You can modify a Decision Point object.

Follow these steps:

1. Click the **Select Tool** and select the Decision Point object.

i **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. You can do any of the following:

- Drag any of the bounding-box points to change the shape size.



- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The Decision Point object is modified.

6.9.3 Decision Point Properties

Set the following Decision Point properties.

6.9.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none"> Enter the stroke number. Use the up / down arrows to increase / decrease the stroke. Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Color Palette	 <p>You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.</p>     <p>Select to apply the selected border or fill color.</p>

6.9.3.2 Specific Properties

Properties before placement:

Specific Property	Description
Unique Designation	Decision Point name.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

Width / Length

Object width / length (in meters).

6.10 Observation Post Tool

You can designate positions from which military observations are made, or fire directed and adjusted, and which possess appropriate communications. Also, observation posts may be airborne.



Do any of the following:

- [Create an Observation Post Object \(below\)](#)
- [Modify an Observation Post Object \(on the next page\)](#)

6.10.1 Create an Observation Post Object

You can create a Observation Post object, visible in 2D / 3D.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tab.

NOTE

If you have previously closed the panel, select **Show All Panels** from the **View** menu (see [View Menu Options \(on page 235\)](#)) to show all the VBS Plan UI panels.

2. Expand **Control Measures** (expanded by default).



3. Click the **Observation Post Tool**.



NOTE

To stop drawing the object, press **Esc**. This removes the object from the map.

4. Set the [Global Properties \(on page 206\)](#).
5. Set the [Specific Properties \(on page 206\)](#).
6. Click a position on the map, where you want to designate an observation post, while holding the **LMB**, and drag the mouse to set the observation post size. Release the **LMB** to set the size.

The Observation Post object appears on the map and is selected.

7. Click outside the shape.

The Observation Post object is created on the map.

To modify the Observation Post object, see [Modify an Observation Post Object \(below\)](#).

6.10.2 Modify an Observation Post Object

You can modify an existing Observation Post object.

Follow these steps:

1. Click the **Select Tool** and select the Observation Post object.

i **NOTE**

The Select Tool has the following considerations:

- The cursor always selects the top object across all the available overlays.
- 3D objects are always placed above 2D objects, regardless of the overlay order.
- Objects that are part of a hidden / locked overlay are not selectable.

For more information, see [Managing Overlays \(on page 211\)](#).

2. You can do any of the following:

- Drag any of the bounding-box points to change the shape size.



- Drag the object to relocate it to a different position on the map.
- Modify the [Global Properties \(on the next page\)](#).
- Modify the [Specific Properties \(on the next page\)](#).
- Delete the object by pressing **Delete**.

The Observation Post object is modified.

6.10.3 Observation Post Properties

Set the following Observation Post properties.

6.10.3.1 Global Properties

Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none"> Enter the stroke number. Use the up / down arrows to increase / decrease the stroke. Use the drop-down to select one of the preset values.
Fill Color	 Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Color Palette	 You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the Saved Colors list.     Select to apply the selected border or fill color.

6.10.3.2 Specific Properties

Properties before placement:

Specific Property	Description
Unique Designation	Observation Post name.
Font Size	Font size.
Render Text on Surface	Select to snap the text to the same plane as the ground.

Additional properties after placement:

Specific Property	Description
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).

Width / Length

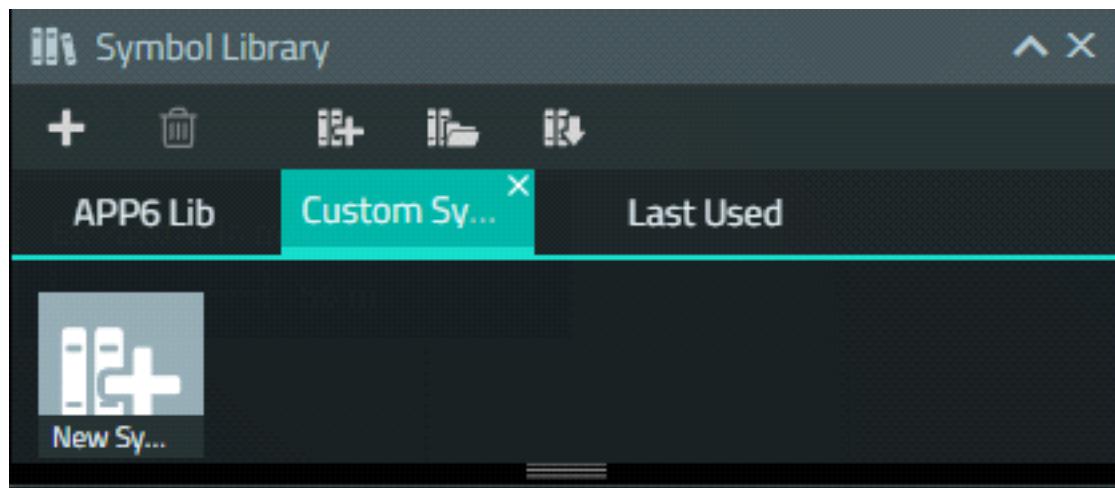
Object width / length (in meters).

6.11 Symbol Library

The Symbol Library allows you to create custom Drawing symbols, using overlay objects created with the tools described in [Drawing Objects \(on page 157\)](#). The custom Drawing symbols can also be composite symbols, consisting of several overlay objects.

For example, you can create a custom Drawing symbol by drawing a custom line, using the [Line Tool \(on page 160\)](#) or the [Freedraw Tool \(on page 165\)](#), and then store it as a custom Drawing symbol in the Symbol Library.

Image-16: Symbol Library panel with three custom Drawing symbols



- Create a New Symbol Library (below)
- Use an Existing Symbol Library (on the next page)

6.11.1 Create a New Symbol Library

You can create a new Symbol Library, for your custom Drawing symbols.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tools category.
2. In the **Symbol Library** panel, click the **New Symbol Library** icon, to create a new Symbol Library.



A new Symbol Library is created and a new tab appears in the Symbol Library panel.

3. To name the Symbol Library, click the tab name, enter the new text, and press **Enter** to confirm.

4. Select any custom Drawing symbol on the map (use [Group \(on page 235\)](#) to group several objects, if you want to create a composite symbol), and click the **Add Symbol** icon.



The new symbol is added to the Symbol Library, and appears in your Symbol Library tab.

5. (Optional) If you want to remove a symbol from the Symbol Library, click the symbol in your Symbol Library tab, and click the **Delete Symbol** icon.



The symbol is removed from the Symbol Library.

6. To name the added symbol, click the symbol name, enter the new text, and press **Enter** to confirm.
7. Repeat steps 3-5 for as many custom Drawing symbols as you need, to populate your Symbol Library.
8. To save your Symbol Library, click the **Save Symbol Library** icon.



The Save Symbol Library dialog opens.

9. Select the folder, enter the Symbol Library file name, and click **Save**.

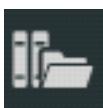
The new Symbol Library is created.

6.11.2 Use an Existing Symbol Library

You can use an existing Symbol Library, to extend the drawing capabilities described in [Drawing Objects \(on page 157\)](#), and add custom Drawing symbols to the map.

Follow these steps:

1. In the [Tools Panel \(on page 23\)](#), select the **Drawing** tools category.
2. In the **Symbol Library** panel, click the **Open Symbol Library** icon, to open an existing Symbol Library.



The Open Symbol Library dialog opens.

Alternatively, you can select the **Last Used** tab, which contains the last used symbols.

3. Browse to the Symbol Library file that you want to open, and click **Open**.

The Symbol Library is loaded.

4. Click any of the available library symbols to select it.
5. Click a location on the map to place the symbol.

 **NOTE**

Selecting the symbol again stops the placement, and selecting a different symbol mid-placement switches to it.

The custom Drawing symbols appear on the map.

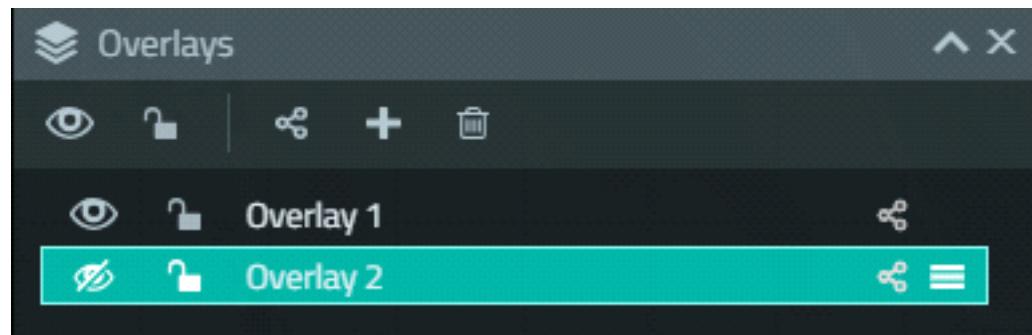
7. Managing Overlays

Drawing Objects (on page 157), Tactical Objects (on page 53), and CAS Objects (on page 103) are stored in overlays. You can create multiple overlays where different objects are stored. This allows you to show objects that are only relevant to certain Trainees.

You can manage existing overlays in the **Prepare Mode** and **Execute Mode**, using the Overlays panel:

- Add / Delete Overlays (on the next page)
- Rename Overlays (on the next page)
- Show / Hide Overlays (on the next page)
- Lock / Unlock Overlays for Editing (on page 214)
- Overlay Draw Order (on page 213)
- Share Overlays - Network Collaboration (on page 215)

Image-17: Overlays panel



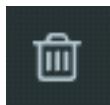
7.1 Add / Delete Overlays

You can add and delete overlays.

- To add an overlay, click the Plus icon.



- To delete an overlay, click the overlay row to select it, and then click the Trash icon.



7.2 Rename Overlays

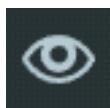
You can rename an existing overlay.

1. Click the overlay row to select it.
2. Click the overlay name.
3. Type the new overlay name and press **Enter** to confirm.

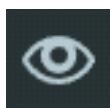
7.3 Show / Hide Overlays

You can show / hide all the overlays or a specific one.

- To toggle show / hide for all the overlays, click the top Eye icon.



- To toggle show / hide for a specific overlay, click the Eye icon in the specific overlay row.



NOTE

Placing [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), or [CAS Objects \(on page 103\)](#) in a hidden overlay is not allowed. Also, the show / hide overlay options only applies locally, which means that if an overlay is hidden on one computer, it remains shown on the other computers in the multiplayer scenario.

Overlays created in the **Prepare Mode** and saved in the mission are available to every Trainee.

7.4 Overlay Draw Order

You can control the draw order of objects within a single overlay, and the order of overlays, relative to one another.

VBS Plan preserves the history of the draw order, in which the objects are created in the overlay.

i NOTE

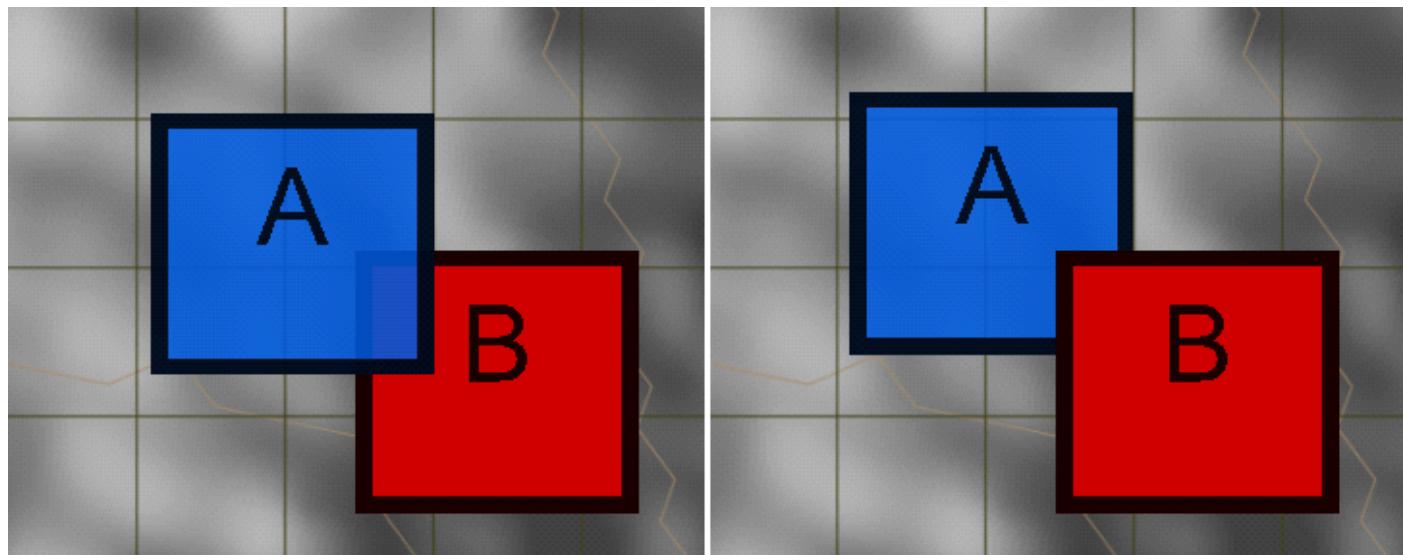
3D Objects (see [3D Objects Tools \(on page 189\)](#)) have a higher priority than 2D Objects (see [2D Objects Tools \(on page 179\)](#)), and are always displayed on top.

To change the draw order of objects, follow these steps:

1. Use the **Select Tool** (see [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), [CAS Objects \(on page 103\)](#)) to select the objects. Hold **Shift** to select multiple objects.
2. Use the **Cut (on page 234) / Paste (on page 234)** options to bring the selected objects to the front.

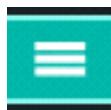
The draw order of the objects changes.

Image-18: Draw order change: before (left) and after (right)



To change the overlays order, follow these steps:

1. In the **Overlays** panel, click an overlay.
2. Using the **Drag** icon, drag and drop the overlay to a different position in the overlays list.

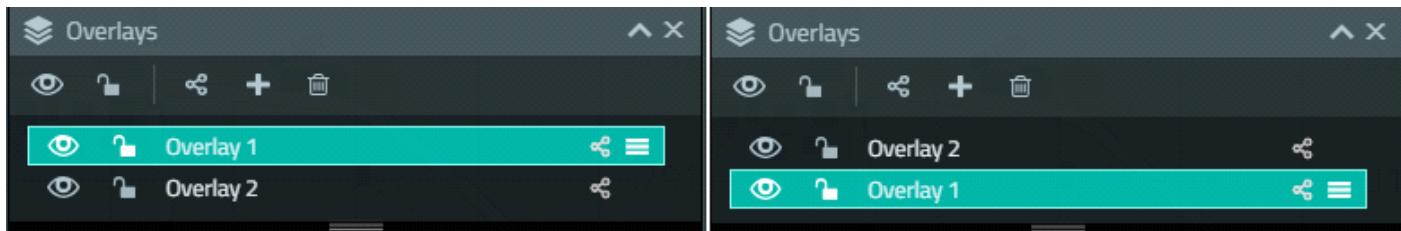


TIP

You can drag the overlay directly. Step 1 is only a safety measure to ensure that the wrong overlay is not accidentally moved to a different position.

The overlays order changes.

Image-19: Overlays order change: before (left) and after (right)



7.5 Lock / Unlock Overlays for Editing

You can lock / unlock an overlay for editing.

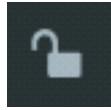
NOTE

Placing Drawing, Tactical, or CAS Objects in a locked overlay is not allowed. Administrators cannot remotely lock an overlay for multiplayer scenario participants. Also, the lock only applies locally, which means that if an overlay is locked on one computer, it remains unlocked on the other computers in the multiplayer scenario.

- To toggle lock / unlock for all the overlays, click the top Lock icon.



- To toggle lock / unlock for a specific overlay, click the Lock icon in the specific overlay row.



7.6 Share Overlays - Network Collaboration

You can share overlays with other multiplayer scenario participants using network collaboration.

An Administrator must define in the **Prepare Mode** which overlays can be shared with certain participant sides and groups.

WARNING

An Administrator sets overlay sharing rights in the **Prepare Mode**. It is not possible to set overlay sharing rights in the **Execution Mode**.

Follow these steps:

1. Open VBS Plan in the **Prepare Mode**, and click the top **Share** icon.



The Share Overlays panel opens, where you can select the scenario participant sides and groups to share the overlays with.



The **Side** selection is primary, while the **Groups** selection is secondary. For example, if you want to share the overlays with everyone on the BLUFOR side, you need to check **Side > Blufor**. On the other hand, if you want to share the overlays only with a particular BLUFOR group, you need to make sure that **Side > Blufor** is unchecked (otherwise, the overlays are shared with all BLUFOR participants) and that **Groups > Wanted Group** is checked.

2. Select the scenario participant sides (you can use the **Side** check box to select all the sides) and / or groups (you can use the **Groups** check box to select all the groups) to share the overlays with.
3. Click **Apply** to share the overlay.

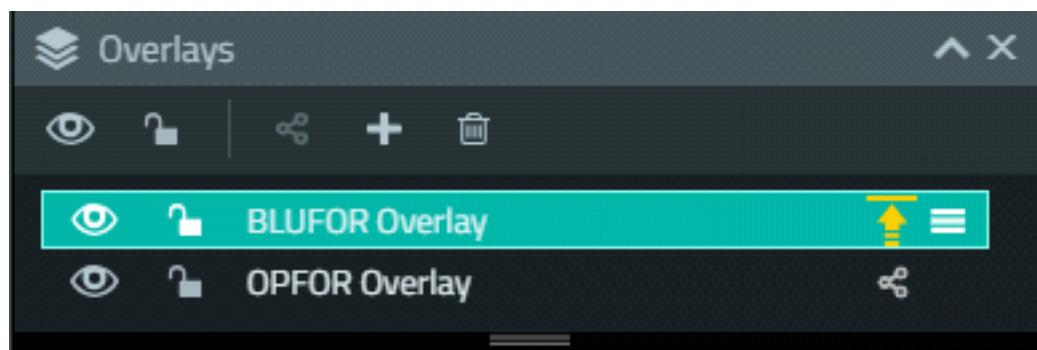
The overlay is shared with the selected sides and / or groups.

Once the overlays are shared and the participants join the multiplayer scenario, each participant can make changes in any of the overlays shared with them, and commit these changes over the network to all other participants (who have the same overlays shared with them).

Follow these steps:

1. Open VBS Plan in Execute Mode (see VBS4 Toolbar in the Introduction to VBS4 Guide and VBS4 Toolbar for Training in the VBS4 Trainee Manual).
2. Select one of the shared overlays in the **Overlays** panel.
3. Make your changes in the overlay.

The **Commit Changes** icon appears next to the overlay.



4. Click the **Commit Changes** icon to update the overlays for all the participants, who have the same overlay shared with them.



The changes are committed and propagated to other participants in the multiplayer scenario.

7.6.1 Share Overlays - Considerations

The following considerations apply:

- When overlay changes are committed, all history of previous actions is cleared for all connected instances of VBS4 that receive the updates (you cannot reach previous actions using **LCtrl + Y / LCtr + Z (Undo / Redo)**, for example). Action history is only available locally. Bohemia Interactive Simulations suggests using multiple overlays, with one being strictly local, to preserve action history.

- If other participants make any uncommitted local changes in the same overlay, their changes are merged with the commit. Overlay changes remain local, until they are committed, after which, they are available to others.
- In **Execute Mode**, you can only make changes to [Drawing Objects](#) (on page 157), but not [Tactical Objects](#) (on page 53) or [CAS Objects](#) (on page 103). If any changes are made to overlay objects in **Execute Mode**, [Tactical Objects](#) (on page 53) and [CAS Objects](#) (on page 103) are transmitted by the **Commit Changes** action as drawings.

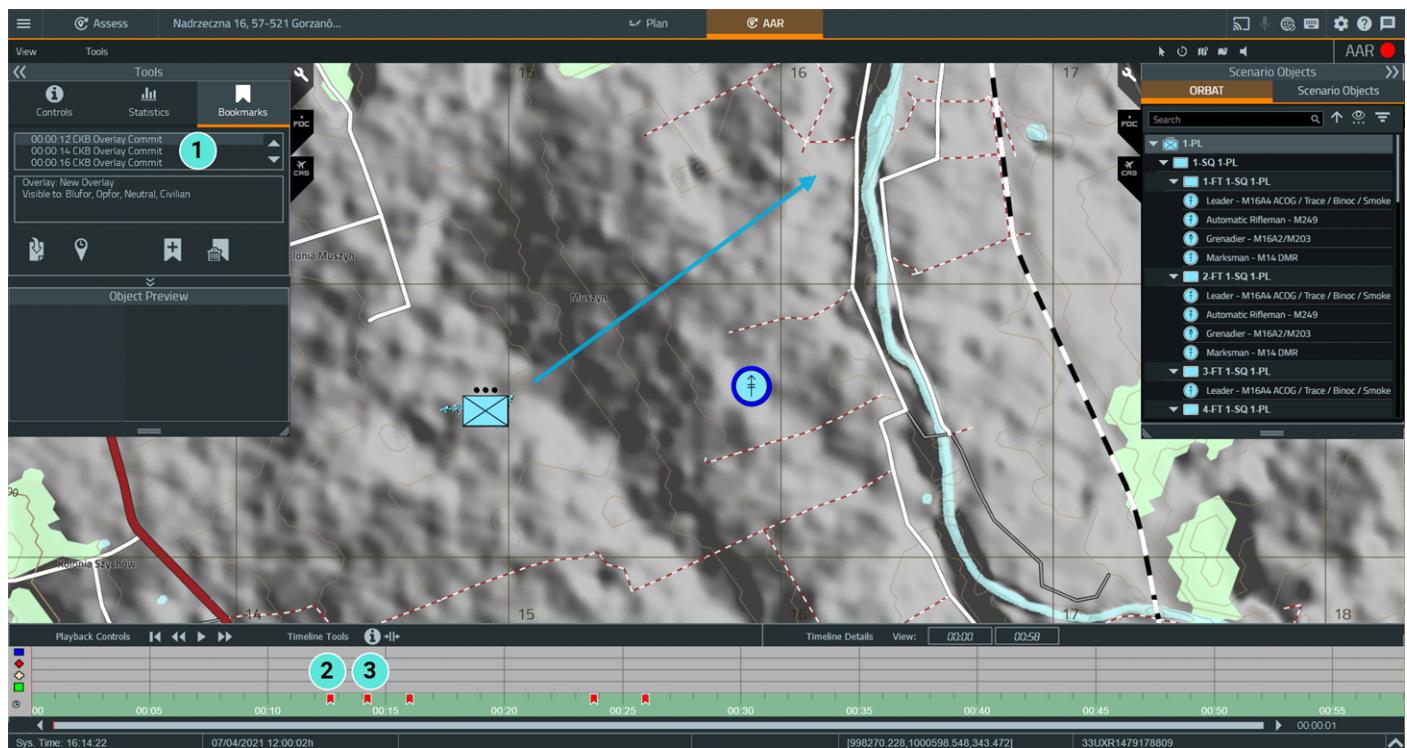
7.6.2 After Action Review (AAR)

If After Action Review (AAR) (see the VBS4 AAR Manual) is recorded, every commit creates an AAR bookmark. In addition, VBS4 can add automatic overlay commits.

WARNING

Do not add new overlays during AAR recording in **Execute Mode**. VBS Plan functionality is not finalized in AAR mode. New local (not shared) overlays are not recorded, resulting in drawings not being visible in AAR (only bookmarks).

Image-20: VBS Plan commit bookmarks in the AAR



Number	Description
1	VBS Plan commit bookmarks.
2, 3	VBS Plan commits in the AAR Timeline.

8. Export Content

You can export content from VBS Plan as:

- [VBS Plan Drawings \(below\)](#)

To import content, see [Import Content \(on page 52\)](#).

8.1 VBS Plan Drawings

You can export VBS Plan Drawings ([.ckbo](#) files).

NOTE

VBS Plan Drawings are only visible in scenarios with the same geographic location.

Follow these steps:

1. Open **File > Export > Plan Overlays**.

WARNING

Only visible overlays can be exported. For more information, see [Show / Hide Overlays \(on page 212\)](#).

2. Browse to the location where you want to save the file.

3. In **File name**, enter a name for your VBS Plan Drawing ([.ckbo](#)) file, and click **Save**.

The VBS Plan Drawings are exported.

9. Review Plans

Once you have placed [Drawing Objects](#) (on page 157), [Tactical Objects](#) (on page 53), or [CAS Objects](#) (on page 103) on the map, you can review the Tactical Plan by editing the [Specific Properties](#) (on page 240) of existing VBS Plan objects, and use the [Timeline](#) (on page 32) to visualize, coordinate, and update the execution of your Tactical and CAS Orders.

WARNING

No [Timeline](#) (on page 32) modifications are possible during Scenario execution. Also, AI timings do not work if the Scenario execution speed is changed.

To be able to preview the Tactical Plan as a mission, as described in the [VBS Plan Workflow](#) (on page 14), make sure that there is at least one playable Tactical or CAS Unit object placed on the map.

WARNING

A mission that has no playable Tactical or CAS Unit objects cannot be previewed.

For more information, see [Units Tool](#) (on page 57) and [CAS Units Tool](#) (on page 108).

To zoom in / out of the timeline to change its scale and update the Tactical or CAS Orders that take a small / large amount of time to execute, click any of the [Timeline Density Controls](#).

Image-21: Left to right: zoom in, out, reset

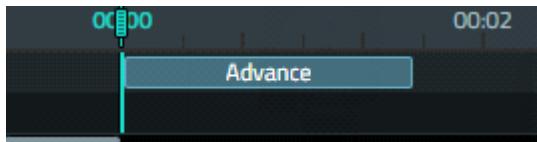


NOTE

Depending on the timeline scale, the current timeline position may be rounded up. For example, if the Order time box is between 0 and 5 minutes, a 2.5-minute timeline position may be rounded up to a 2-minute timeline position.

To change the Tactical or CAS Order execution start and end time, drag the Tactical or CAS Order time box left / right in the timeline.

Image-22: Advance Order time box in the timeline



NOTE

For Defend, Fire Mission, and Suppress Orders (see [Defend Order Tool \(on page 97\)](#), [Fire Mission Order Tool \(on page 92\)](#), and [Suppress Order Tool \(on page 88\)](#)), you can also shorten / lengthen the duration of the Order execution by dragging the start and end arrows of the Order in the timeline.



For Fire Mission Orders (see [Fire Mission Order Tool \(on page 92\)](#)), start time is time on target (the time artillery units start firing) and does not take into account the artillery preparation time.

To see where the Tactical or CAS Units will be and what they will do at a specific time, drag the **Timeline Scrubber** left / right in Prepare Mode, to move back and forward in time.

NOTE

The Tactical Units move along the real path (not a straight line, such as indicated by Tactical Order markers), using the terrain navigation mesh. This path takes into account the worst-case time estimate for the Tactical Units to finish executing a Tactical Order. However, since the timeline only provides an estimate, Tactical Units may finish executing a Tactical Order sooner when the Scenario runs.

Assault Orders (see [Assault Order Tool \(on page 84\)](#)) are non-deterministic, and it is not possible to calculate in advance in Prepare Mode how much time they will take to execute, if the Tactical Units need to take cover and / or engage the enemy in the Preview / Execute Mode.

Image-23: Timeline Scrubber at a specific mission time

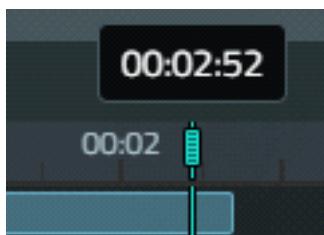


Image-24: Tactical Units timeline movement along the navigation mesh



Fire Mission Order placement has the following error feedback:

i NOTE

The same error feedback is available in VBS Call for Fire.

Error	Resolution
Gunline has insufficient ammunition.	Decrease the Fire Mission Order duration, using Time on Target and End Time , or the fire rate, using Rounds per Minute , in Modify a Fire Mission Order (on page 94) .
Unattainable fire rate.	Adjust Rounds per Minute in the Modify a Fire Mission Order (on page 94) .
Mission would have to start before scenario.	Adjust Time on Target in the Modify a Fire Mission Order (on page 94) .
Target is farther than maximum range for supporting gun.	Move the Target (see Target Tool (on page 76)) closer to the Fire Mission Order (see Fire Mission Order Tool (on page 92)).
Target is closer than minimum range for supporting gun.	Move the Target (see Target Tool (on page 76)) farther from the Fire Mission Order (see Fire Mission Order Tool (on page 92)).

Error	Resolution
Firing solution for this target cannot be attained with supporting gun.	Change the Fire Mission Order (see Fire Mission Order Tool (on page 92)) terrain elevation by moving it, based on the minimum and maximum elevations indicated in the error for the given gun type.
Call for Fire is not compatible with Advanced Ballistics.	Disable the Advanced Ballistics option in Simulation Settings (see the VBS4 Administrator Manual).

The Defend Order (see [Defend Order Tool \(on page 97\)](#)) provides debug visualizations that show how effective the defense is.

NOTE

The debug visualizations can only be enabled after the tactical mission is built (see [Build Missions \(on page 224\)](#)) and are only visible when the scenario executes.

FEATURE NOTICE

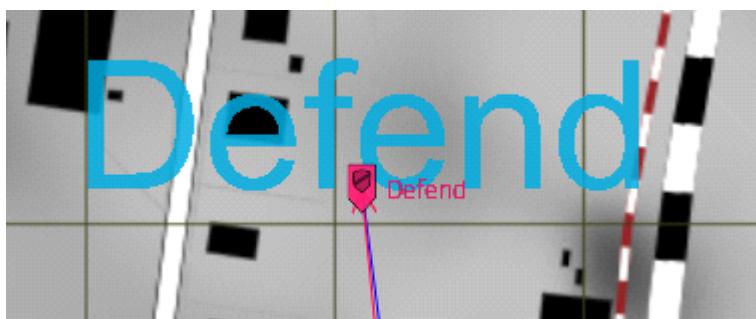
The debug visualizations vary, depending on the Tactical Unit type, and may change in future releases of VBS4.

Follow these steps:

1. Build the mission.

The Defend Order tactical symbol is converted to a Defend Order waypoint.

2. Double-click the Defend Order waypoint.



The waypoint Object Properties dialog opens.

3. Click **Advanced**, and set `debugEnabled` to `true`.
4. Click **OK** twice.
5. Run the scenario and observe the Defend Order waypoint visualizations.



EXAMPLE

For the squad Tactical Unit type, the green and red positions indicate good and bad defense spots, respectively.

Image-25: Squad Defend Order positions at nighttime



Once the timeline modification is complete, proceed to building your tactical mission. For more information, see [Build Missions \(on the next page\)](#).

10. Build Missions

Once you finish designing your Tactical Plan, using [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), and [CAS Objects \(on page 103\)](#), and reviewing it (see [Review Plans \(on page 219\)](#)), you can prepare it further for mission execution by building it.

NOTE

You can only build a mission in **Prepare Mode**.

To build the Tactical Plan into a mission, click **Build Mission** or select **File > Build Mission**.

NOTE

Built [Tactical Objects \(on page 53\)](#) have the following aspects:

- When the mission is built, Tactical Objects are converted to VBS4 Control AI personnel and vehicle entities, Waypoints (see [Waypoints in the VBS4 Editor Manual](#)), and VBS Call for Fire fire missions and gunlines.
- When the mission runs, the built VBS4 AI personnel and vehicle entities execute Orders, converted to Waypoints, and take Control Measures (apart from Boundary Lines) into account.

Built [CAS Objects \(on page 103\)](#) have the following aspects:

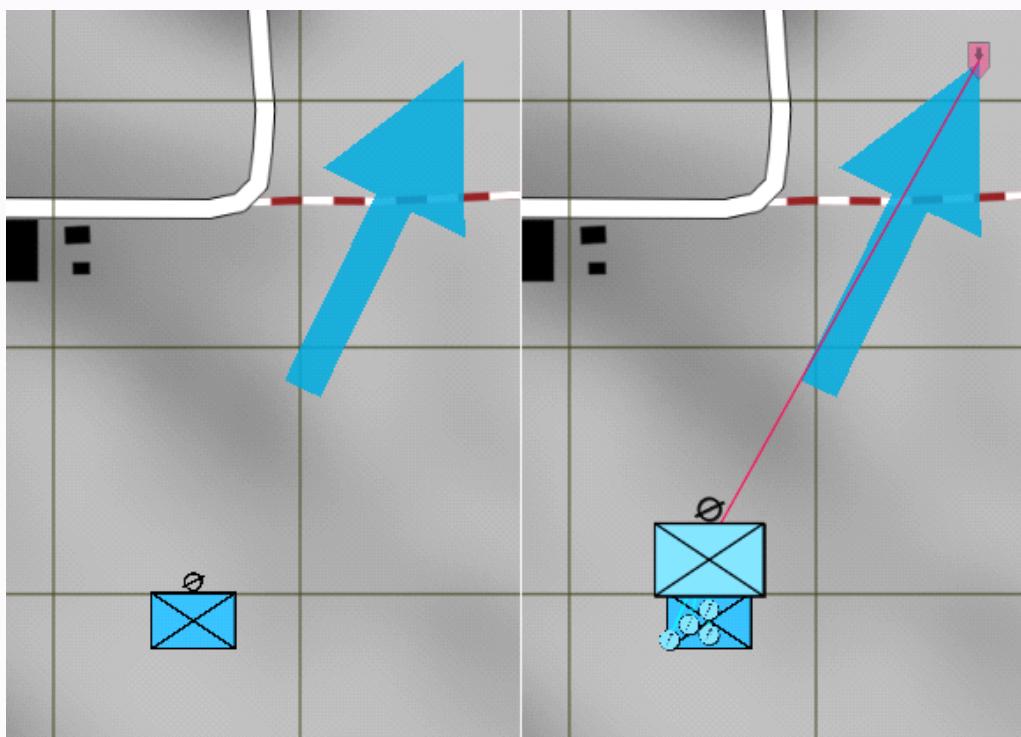
- When the mission is built, CAS Unit Objects are converted to VBS4 personnel and aircraft entities (see [CAS Units Tool \(on page 108\)](#)).
- When the mission runs, the built VBS4 entities execute the CAS Orders (see [CAS Mission Order Tool \(on page 147\)](#)), using Control Measures (see [CAS Initial Point \(IP\) Tool \(on page 128\)](#), [CAS Control Point \(CP\) Tool \(on page 125\)](#), [CAS Holding Area \(HA\) Tool \(on page 131\)](#), [CAS Battle Position \(BP\) Tool \(on page 134\)](#), [CAS No Fly Zone \(NFZ\) Tool \(on page 137\)](#), [CAS No Fire Area \(NFA\) Tool \(on page 142\)](#)).

Rebuilding a mission resets the VBS4 entities based on their Tactical / CAS Objects representations.



EXAMPLE

Image-26: Before (left) and after (right) Build Mission



As can be seen in the right image, a BLUFOR group and waypoints are added after the mission is built.

Once the mission is built, you can make additional changes.

Follow these steps:

1. Add additional Editor Objects, or update the ones created by VBS Plan. For more information, see Scenario Preparation in the Introduction to VBS4 Guide.



WARNING

If you build a mission, go back to the VBS Plan, and delete the Tactical Objects representing mission entities. The latter are not removed and have to be deleted manually in the Editor. Also, if you make changes to mission entities represented by Tactical Objects in the Editor, rebuilding a mission in VBS Plan resets any of those changes.

2. Preview the mission in single-player.

Select **Preview** in the VBS4 Toolbar (see VBS4 UI Overview in the Introduction to VBS4 Guide).

WARNING

A mission that has no playable units cannot be previewed.

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

TIP

To select a specific playable character, edit the wanted unit (from the list of units, created with **Build Mission**), using Edit Unit Options (see the VBS4 Editor Manual) in the Editor.

For more information, see Scenario Preparation in the Introduction to VBS4 Guide.

3. Save your Tactical Plan and built mission:

Click the **Main Menu** icon and select **Battlespaces > Save**.



For more information, see [Save \(on page 21\)](#).

4. Execute the Tactical Plan.

Instructors see Tactical Orders that Tactical Units execute at in the Scenario.



For more information, see Scenario Execution in the Introduction to VBS4 Guide.

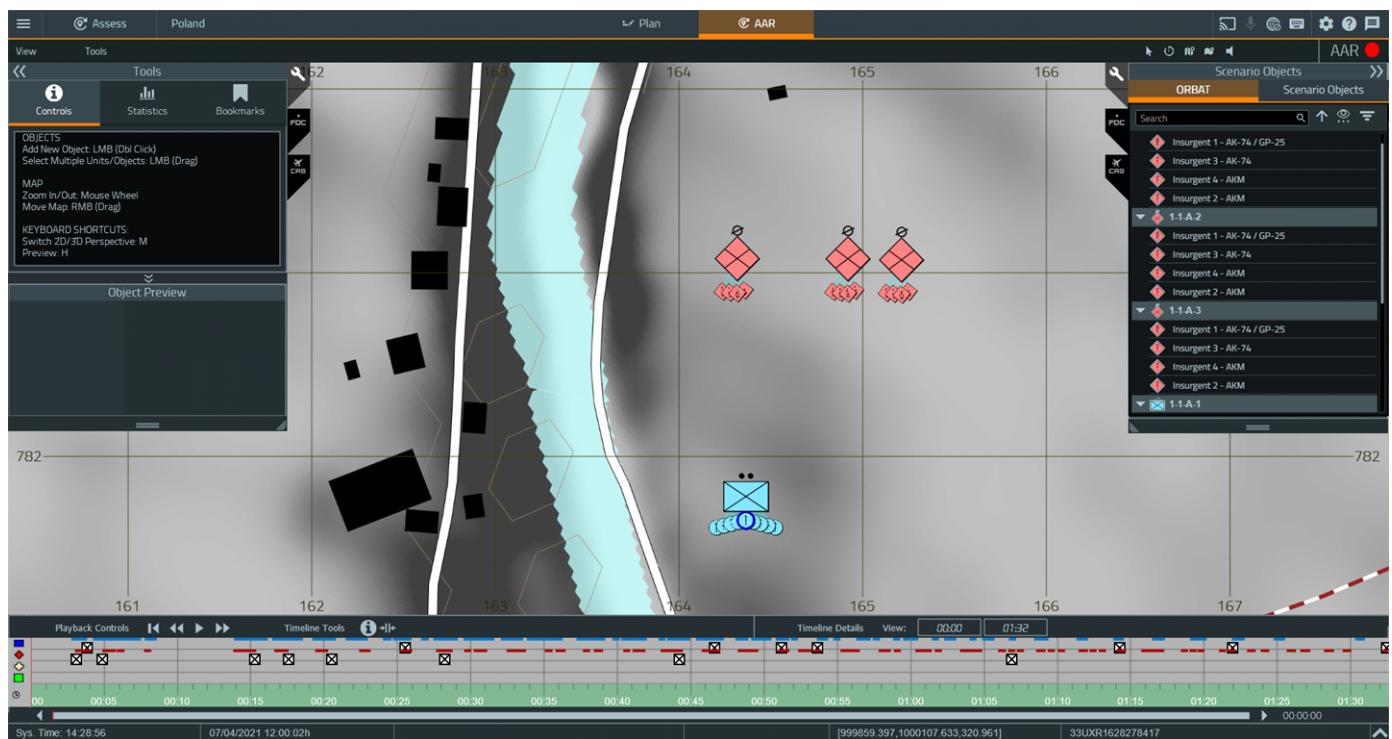
11. VBS Plan in AAR

Administrators / Instructors, and Trainees are able to review VBS Plan training scenarios retrospectively, using the After Action Review (AAR) feature. This feature enables the analysis of Trainee decision making and performance during a scenario.

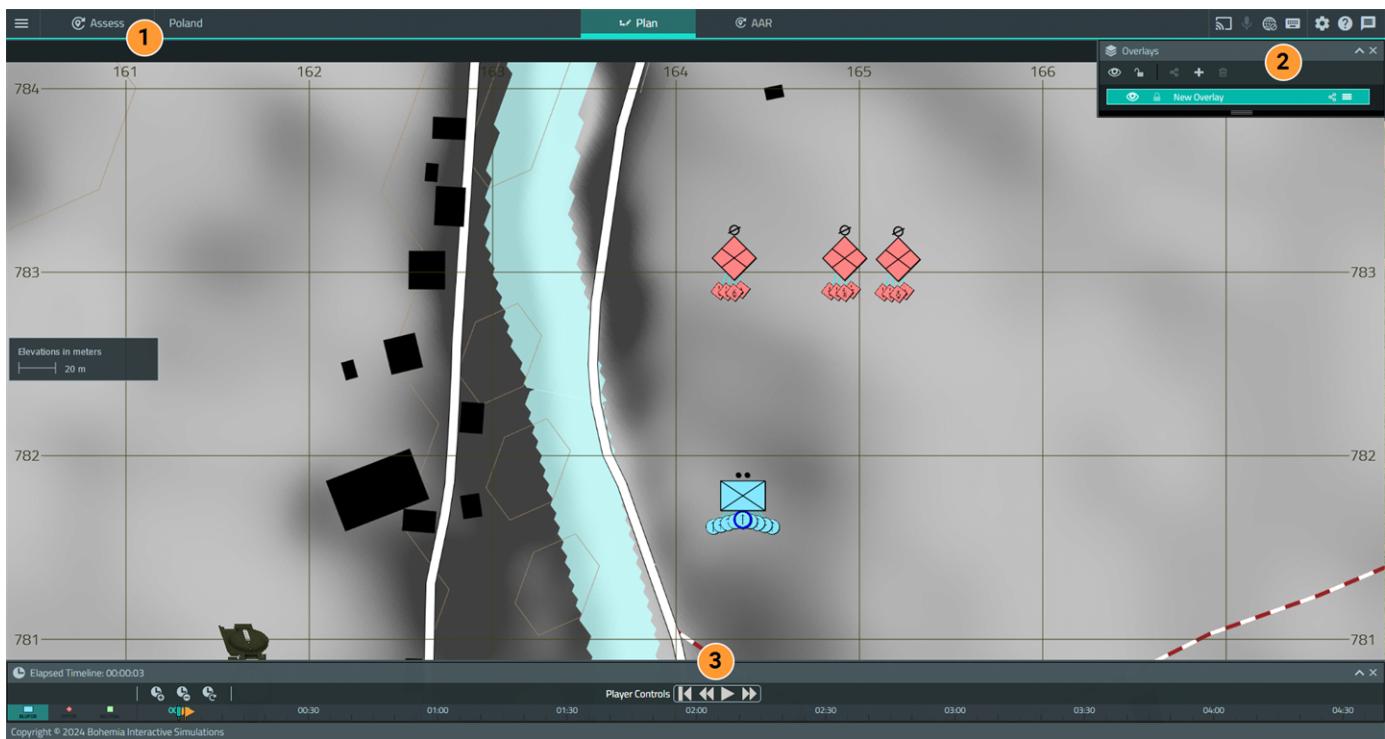
AAR scenario recordings are accessed by the Administrator / Instructor. However, the Trainee can also view them on their computer.

For more information about the AAR, see After Action Review (AAR) in the VBS4 AAR Manual.

In the Assess Mode (see Scenario Assessment in the Introduction to VBS4 Guide), with the AAR Tool UI open, select **Plan** in the VBS4 Toolbar (see the Introduction to VBS4 Guide), to access VBS Plan in AAR UI.



The VBS Plan Tool opens in AAR.



No.	Name	Description
1	VBS4 Toolbar (below)	The VBS Plan Toolbar in Assess Mode, provides access to the global Main Menu functions, Tool Selection switching to AAR, plus VBS4 Settings, Documentation, and Notifications.
2	Overlays Panel (on the next page)	Shows the VBS Plan overlays, available in the AAR recording.
3	Timeline Panel (on the next page)	The VBS Plan tactical mission execution timeline.

TIP

You can resize the panels by dragging their borders. To reset the panels to default view, select [Show All Panels \(on page 236\)](#) in the [View Menu Options \(on page 235\)](#).

11.1 VBS4 Toolbar

The VBS Plan Toolbar in Assess Mode, provides access to the global Main Menu functions, Tool Selection switching to AAR, plus VBS4 Settings, Documentation, and Notifications.

To access the VBS4 Main Menu for the VBS4 Toolbar in Assess Mode, click the **Main Menu** icon.

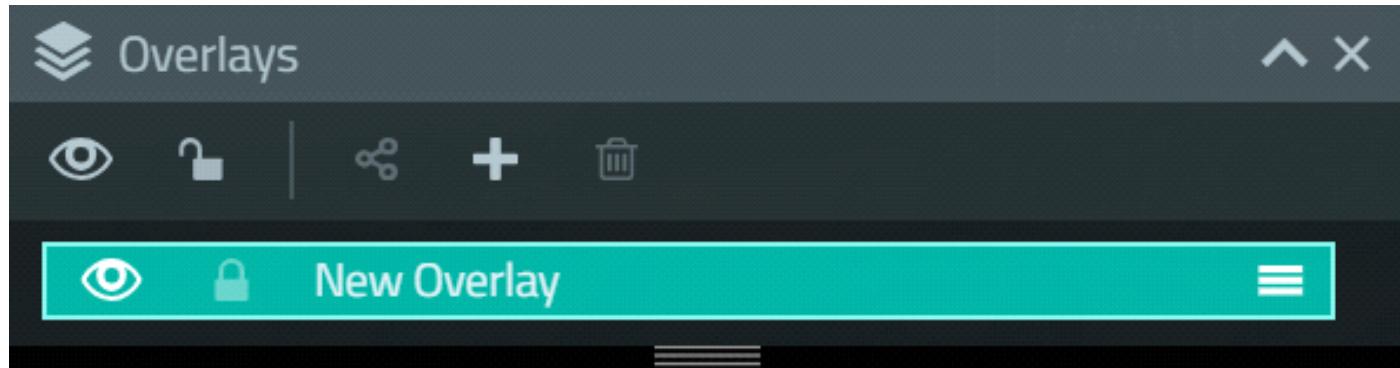


The following options are available:

Option	Description
Save As	Saves the AAR as a Battlespace scenario. For more information, see Creating a Battlespace from the AAR in the VBS4 AAR Manual.
Close	Closes the AAR and Assess Mode.

11.2 Overlays Panel

The Overlays Panel shows the VBS Plan overlays, available in the AAR recording.



For more information on the Overlays Panel options, see [Managing Overlays](#) (on page 211).

11.3 Timeline Panel

The Timeline Panel contains the VBS Plan tactical mission execution timeline.

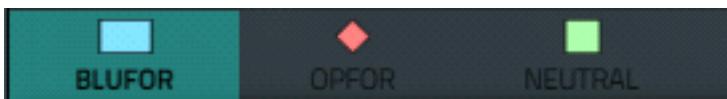
- **Player Controls** - The AAR playback controls.



The AAR playback controls are (left to right):

- Return to Start
- Rewind
- Play / Stop
- Fast-Forward

- **Timeline Legend** - The mission timeline legend, consisting of BLUFOR, OPFOR, and Neutral tactical units.



These legend icons appear in the timeline, to indicate a unit-specific event.

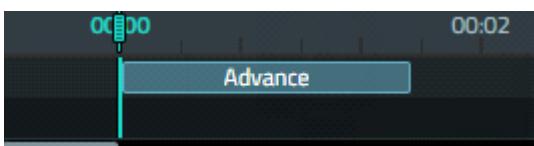
- **Timeline Density Controls** - The timeline density controls allow you to zoom in, zoom out, and reset to the default timeline density level.

Image-27: Left to right: zoom in, out, reset



- **Other Timeline Controls** - In addition to the **Timeline Density Controls**, you can also change the start and end time of orders to execute, by dragging the order time box left (to start the order earlier) and right (to start the order later) in the timeline.

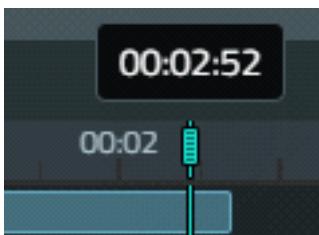
Image-28: Advance Order time box



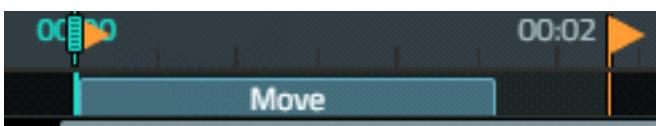
NOTE

For Suppress Orders (see [Suppress Order Tool \(on page 88\)](#)), you can also lengthen / shorten the duration of the order execution by dragging the start and end positions of the order in the timeline.

The blue **Timeline Scrubber** allows you to jump to a specific mission time.



The AAR start and end recording time orange-flag indicators show the extent of the VBS Plan recording for the AAR.

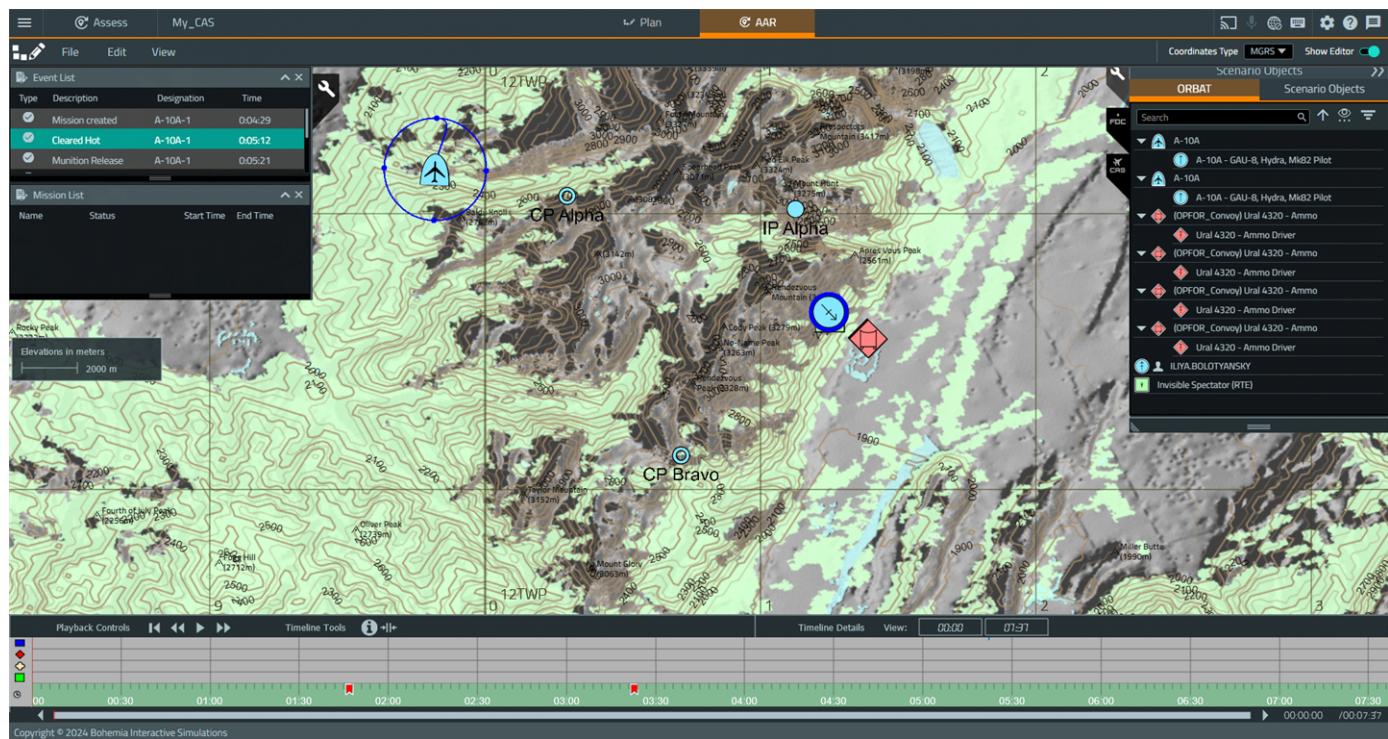


12. VBS Close Air Support (CAS) in AAR

Administrators / Instructors, and Trainees are able to review CAS training scenarios retrospectively, using the After Action Review (AAR) feature. This feature enables the analysis of Trainee decision making and performance during a scenario .

AAR scenario recordings are accessed by the Administrator / Instructor. However, the Trainee can also view them on their computer. For more information about accessing AAR recordings and using the AAR UI, see After Action Review (AAR) in the VBS4 AAR Manual.

To open the CAS AAR UI, click the **CAS** tab in the AAR.



The CAS AAR UI consists of:

- [Event List \(below\)](#)
- [Mission List \(on the next page\)](#)

In addition, VBS4 automatically adds CAS activity to the AAR Timeline as overlay commits and corresponding AAR bookmarks. For more information, see [Share Overlays - Network Collaboration \(on page 215\)](#).

12.1 Event List

The Event List Panel shows the CAS events that happened during the CAS mission.

The Event List Panel is available in the Preview / Execute / Assess Modes.

In Assess Mode, CAS Events are added to the AAR Timeline (see AAR Playback and the User Interface in the VBS4 AAR Manual).

Type	Description	Designation	Time
✓	Mission created	A-10A-1	0:04:32
✓	Egressing	A-10A-1	0:09:26
✓	Off Dry	A-10A-1	0:09:26
⚠	No Cleared Hot Given	A-10A-1	0:09:26
⚠	Not Able to Fire	A-10A-1	0:09:26

For more information, see [CAS Event List Panel \(on page 39\)](#).

12.2 Mission List

The Mission List shows all the CAS missions performed by individual aircraft in the CAS Unit.

The Mission List Panel is available in the Preview / Execute / Assess Modes.

Name	Status	Start Time	End Time
A-10A	On Mission	0:04:32	0:06:45

For more information, see [CAS Mission List Panel \(on page 38\)](#).

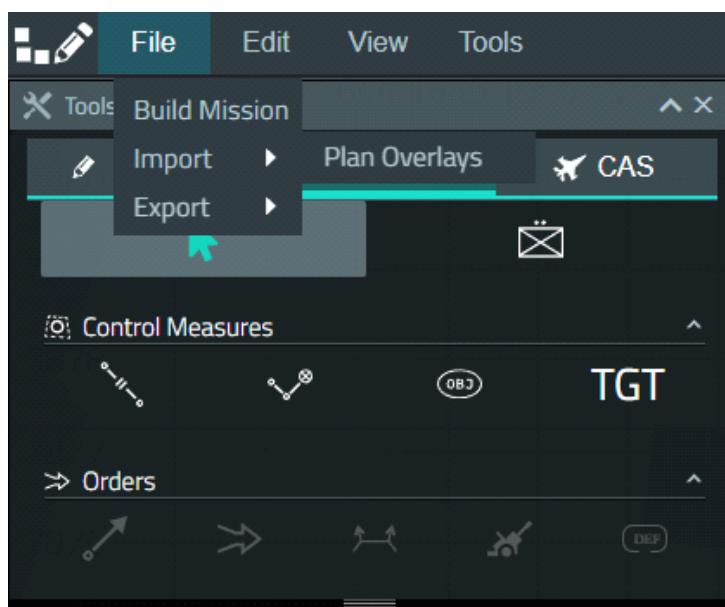
13. Menu Options Reference

When creating overlay objects (see [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), [CAS Objects \(on page 103\)](#)), the following menu options can be used:

- [File Menu Options \(below\)](#) - Building a mission, importing / exporting content.
- [Edit Menu Options \(on the next page\)](#) - Standard editing options for overlay objects, such as copy / paste / delete.
- [View Menu Options \(on page 235\)](#) - VBS Plan UI options.
- [Tools Menu Options \(on page 236\)](#) - Weather controls and ORBAT (Order of Battle) specification.

13.1 File Menu Options

Use the File menu to build missions, import / export content.



Click **File** in the top menu.

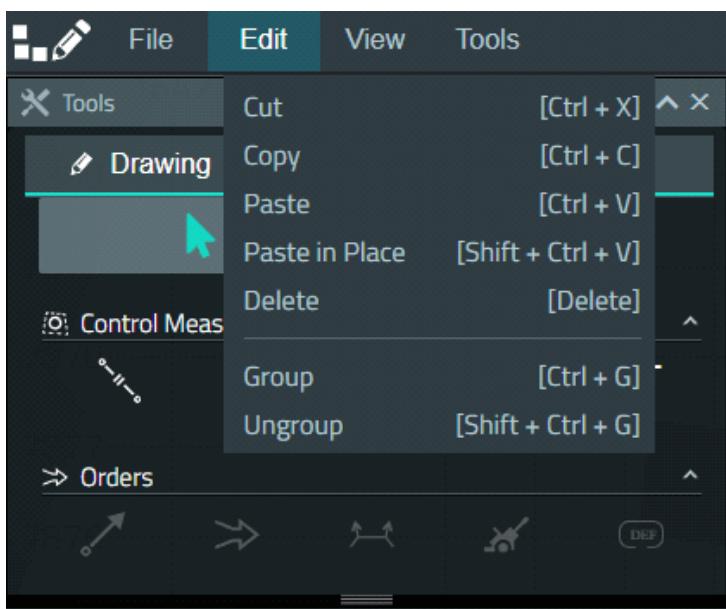
Select one of the following menu options:

Menu Option	Description
Build Mission	Builds a tactical mission. For more information, see Build Missions (on page 224) .
Import	Imports Drawing Objects (on page 157) , Tactical Objects (on page 53) , and CAS Objects (on page 103) from .ckbo files . For more information, see Import Content (on page 52) .

Menu Option	Description
Export	Exports Drawing Objects (on page 157), Tactical Objects (on page 53), and CAS Objects (on page 103) to .ckbo files. For more information, see Export Content (on page 218).

13.2 Edit Menu Options

Use the Edit menu to edit overlay objects.



Click an overlay object on the map to select it.

Click **Edit** in the top menu.

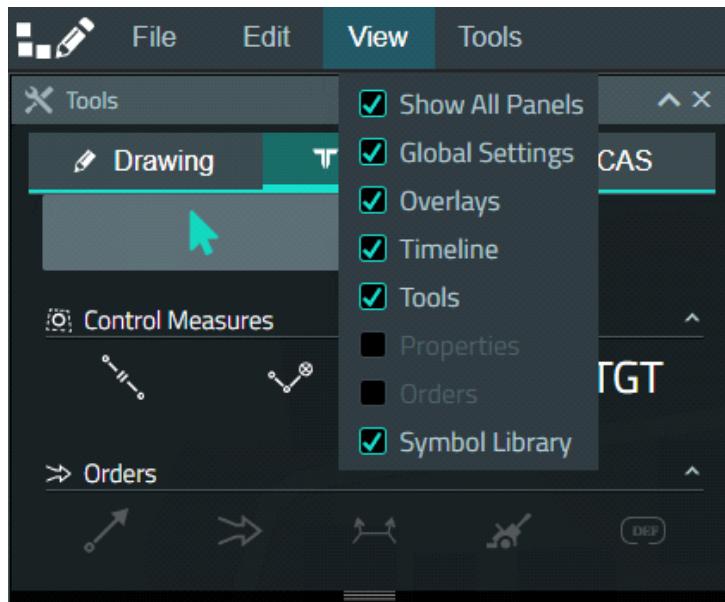
Select one of the following menu options:

Menu Option	Description
Cut	Click Cut (or press Ctrl + X) to cut the object.
Copy	Click Copy (or press Ctrl + C) to copy the object.
Paste	Click Paste (or press Ctrl + V) to paste the object.
Paste in Place	Click Paste in Place (or press Shift + Ctrl + V) to paste the object in place (the object is pasted at the same map coordinates).
Delete	Click Delete (or press Delete) to delete the object.

Menu Option	Description
Group	<p>To group several objects:</p> <ol style="list-style-type: none"> 1. Hold Shift and select the overlay objects. 2. Click Group (or press Ctrl + G) to group the selected overlay objects.
Ungroup	<p>Click Ungroup (or press Shift + Ctrl + G) to ungroup the selected overlay object (which consists of several overlay objects grouped together using the Group (above) menu option).</p>

13.3 View Menu Options

Use the View menu to control the visibility of various VBS Plan UI panels.



Click **View** in the top menu.

Check any of the following menu options, representing the VBS Plan UI panels:

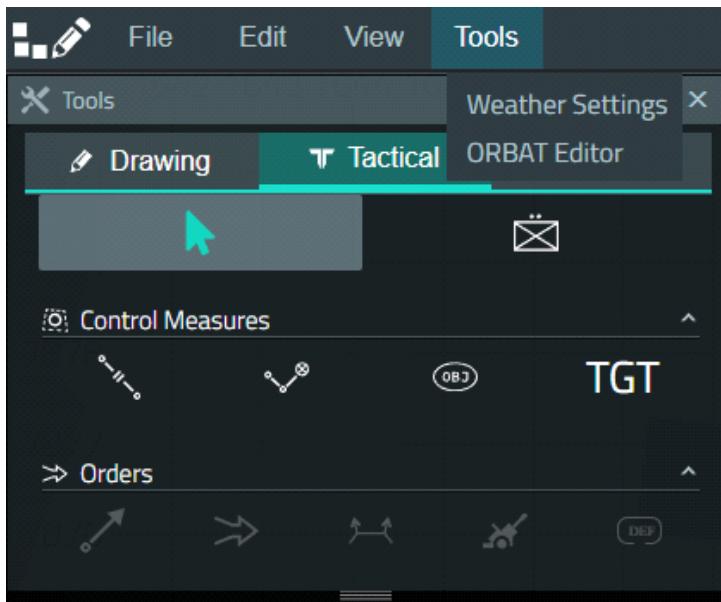
NOTE

If the UI panels do not apply to the currently selected VBS Plan tool and / or object, they appear as unchecked and disabled in the View menu. Also, if you close any of the UI panels by clicking **X**, they remain hidden, until checked again in the View menu.

Menu Option	Description
Show All Panels	Shows / hides all the VBS Plan UI panels in their default view, if some or all of them were closed. For more information about the UI panels, see VBS Plan UI Overview (on page 18) .
Global Settings	Shows / hides the Global Settings (on page 30) .
Overlays	Shows / hides the Overlays panel - see Properties Panels (on page 29) .
Timeline	Shows / hides the Timeline (on page 32) .
Tools	Shows / hides the Tools Panel (on page 23) .
Properties	Shows / hides the Specific Properties panel - see Properties Panels (on page 29) .
Orders	Shows / hides the Orders panel for Tactical Order Tools and CAS Order Tools - see Tactical Objects (on page 53) and CAS Objects (on page 103) .
Symbol Library	Shows / hides the Symbol Library (on page 208) .

13.4 Tools Menu Options

Use the Tools menu to adjust weather parameters, and create / edit ORBATs using the ORBAT Editor.



Click **Tools** in the top menu.

Select one of the following menu options:

Menu Option	Description
Weather Settings	Control the scenario weather - see Weather Settings in the VBS4 Editor Manual.
ORBAT Editor	Create / edit ORBATs - see ORBAT Editor in the VBS4 Editor Manual.

14. Properties Reference

The Drawing and Tactical properties are divided into three categories (all are located on the right side of the VBS Plan UI):

- **Global Properties (below)** - Properties that apply to all the Drawing and some CAS tools (see [Drawing Objects \(on page 157\)](#) and [CAS Objects \(on page 103\)](#) in the Tools Panel (on page 23)).
- **Specific Properties (on page 240)** - Properties of [Drawing Objects \(on page 157\)](#), [Tactical Objects \(on page 53\)](#), and [CAS Objects \(on page 103\)](#) that apply when an existing overlay object is created or modified.

14.1 Global Properties

Depending on the object type, the following Global Properties (displayed from left to right) may be usable with [Drawing Objects \(on page 157\)](#) and some [CAS Objects \(on page 103\)](#)

Image-29: Global Properties example



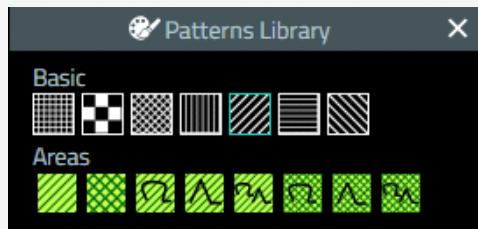
Global Property	Description
Stroke	Stroke size (line width). Do any of the following: <ul style="list-style-type: none">• Enter the stroke number.• Use the up / down arrows to increase / decrease the stroke.• Use the drop-down to select one of the preset values.
Fill Color	Check the Fill checkbox, then click the Fill icon, and use the Color Palette to select the shape fill color.
Border Color	Check the Border checkbox, then click the Border icon, and use the Color Palette to select the shape border color.

Color Palette

You can set the color by clicking the color spectrum, or by typing in the RGBA values manually. Use the Plus icon and the Trash icon to add / remove the selected color to / from the **Saved Colors** list.



Select to apply the selected border or fill color.

**Patterns Library**

A library of patterns for filling shapes (designated by the Pattern icon).

The Basic fill patterns are:

- Grid Pattern
- Chessboard Pattern
- Grid Pattern 45°
- Line Pattern
- Line Pattern 45°
- Line Pattern 90°
- Line Pattern 315°

The Area fill patterns are:

- Bottom slow go
- Bottom no go
- Deciduous forest slow go
- Coniferous forest slow go
- Mixed forest slow go
- Deciduous forest no go
- Coniferous forest no go
- Mixed forest no go

Check the Pattern checkbox, then click the Pattern icon, and use the Patterns Library to select the pattern (basic or area).

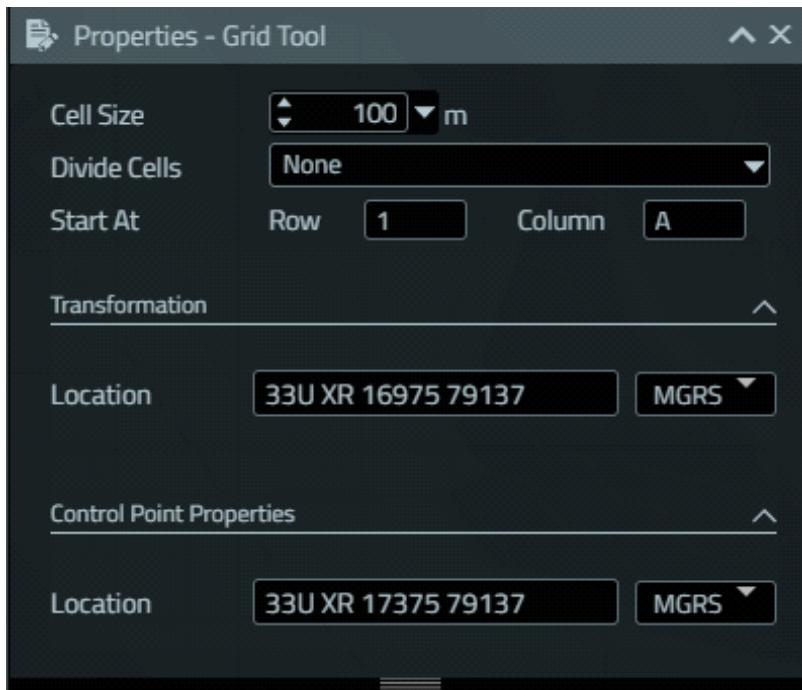
**Pattern Scale**

Pattern scale. Do any of the following:

- Enter the scale number.
- Use the up / down arrows to increase / decrease the scale.
- Use the drop-down to select one of the preset values.

14.2 Specific Properties

The following specific properties may be available for Drawing tools (see [Drawing Objects \(on page 157\)](#)), Tactical tools (see [Tactical Objects \(on page 53\)](#)), and CAS tools (see [CAS Objects \(on page 103\)](#)) depending on the object type.



i NOTE

The following table contains all possible Specific Properties, while each object only has a subset of these properties.

Specific Property	Description
Align Text Horizontally	Check this to align the text horizontally in 3D.
Altitude	ASL altitude (in meters) in the 3D View.
Altitude Description	Altitude information.
Ammo Type	Artillery ammunition type based on the values available in the drop-down: <ul style="list-style-type: none">• HE• Smoke

Area Type	Area type based on the values available in the drop-down: <ul style="list-style-type: none">• Friendly Area• Named Area of Interest• Target Area of Interest• Assembly Area• Assault Position
Arrowheads	Arrow head type, at arrow start and end. Use the graphic types illustrated in the Start and End drop-downs.
Available Targets	Artillery Tactical Unit target based on the values available in the drop-down. The drop-down is populated with the available Target objects. For information on creating artillery targets, see Target Tool (on page 76) .
Azimuth	Target azimuth (in mils).
Base Alt.	Object AGL altitude (in meters) in the 3D View.
Cell Size	Grid cell size (in meters).
Divide Cells	Grid cell subdivision based on the values in the drop-down: <ul style="list-style-type: none">• None• Keypad (9)• Keypad (9), Intercardinal (4)
End Time	Time after which no projectile hits the target (in the format hh:mm).
End Time	Order end time (in the format hh:mm).
Ends	Phase Line symbol ends based on the graphic values in the Start and End drop-downs.
Fill	Unit Symbol fill hue / color mode based on the values in the drop-down.
Font	Font family / type.
Font Size	Font size.
Height	3D shape height (in meters).
Higher Formation	Text modifier for units that indicates a number or a title of higher-echelon command.
Lane Width	Order movement lane width (in meters).
Length	Target length (in meters).

Line Type	Line type. Can be: <ul style="list-style-type: none"> • Default (basic line). • Line Obstacles (used to designate obstacles). • Boundary Markers (used to designate boundary markers). 			
Location	Location based on the Coordinates Type (see Plan Toolbar (on page 22)).			
Location Description	Description of the location.			
Marker Text (A / B)	First (A) and second (B) marker text to appear on the line.			
Marker Type	Boundary marker type based on the values illustrated in the drop-down: <table border="0"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Team / Crew • Squad • Section • Platoon • Company </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Battalion • Regiment • Brigade • Division </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Corps • Army • Army Group • Theater </td> </tr> </table>	<ul style="list-style-type: none"> • Team / Crew • Squad • Section • Platoon • Company 	<ul style="list-style-type: none"> • Battalion • Regiment • Brigade • Division 	<ul style="list-style-type: none"> • Corps • Army • Army Group • Theater
<ul style="list-style-type: none"> • Team / Crew • Squad • Section • Platoon • Company 	<ul style="list-style-type: none"> • Battalion • Regiment • Brigade • Division 	<ul style="list-style-type: none"> • Corps • Army • Army Group • Theater 		
Marker Type	Obstacle marker type based on the values illustrated in the drop-down: <table border="0"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Tanks slow go • Armed vehicles slow go • Tanks no go • Armed vehicle no go • Tanks no go / slow go </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Armed vehicles no go / slow go • Steep edge (high / low) • Buried obstacle • Incremented obstacle </td> </tr> </table>	<ul style="list-style-type: none"> • Tanks slow go • Armed vehicles slow go • Tanks no go • Armed vehicle no go • Tanks no go / slow go 	<ul style="list-style-type: none"> • Armed vehicles no go / slow go • Steep edge (high / low) • Buried obstacle • Incremented obstacle 	
<ul style="list-style-type: none"> • Tanks slow go • Armed vehicles slow go • Tanks no go • Armed vehicle no go • Tanks no go / slow go 	<ul style="list-style-type: none"> • Armed vehicles no go / slow go • Steep edge (high / low) • Buried obstacle • Incremented obstacle 			
Name	Phase Line name.			
Name	Tactical / CAS Unit name. <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> <p>NOTE</p> <p>The Playable Unit checkbox controls whether the Tactical Unit is playable in Execute Mode.</p> </div> <div style="border: 2px solid red; padding: 10px; margin-top: 10px;"> <p>WARNING</p> <p>To preview the mission as described in the VBS Plan Workflow (on page 14), you need to have at least one playable Tactical Unit object on the map.</p> </div>			
Name	Target name.			
Objective	Objective associated with the order based on the values in the drop-down. The drop-down is populated with the available Objective objects.			

Obstacles Type	Obstacle type based on the drop-down values: <ul style="list-style-type: none">• Surface• Water• Other															
Sides	Number of polygon / prism sides.															
SIDC	Unit symbol SIDC.															
Staff Comments	Custom text modifier for units, equipment, and installations.															
Start At	Grid row and column to start at.															
Start Time	Order start time (in the format hh:mm).															
Stroke Type	Freedraw stroke type based on the values illustrated in the drop-down: <ul style="list-style-type: none">• Solid• Dashed• Dotted• Dot-dash• Round-dot															
Stroke Type	Line stroke type based on the values illustrated in the drop-down: <table style="width: 100%;"><tr><td style="width: 33%;">• Solid</td><td style="width: 33%;">• Border</td><td style="width: 33%;">• Flot 3</td></tr><tr><td>• Dashed</td><td>• Feba</td><td>• Notched</td></tr><tr><td>• Dotted</td><td>• Feba 2</td><td>• Railroad</td></tr><tr><td>• Dot-dash</td><td>• Flot 1</td><td>• Wire</td></tr><tr><td>• Round-dot</td><td>• Flot 2</td><td>• ZigZag</td></tr></table>	• Solid	• Border	• Flot 3	• Dashed	• Feba	• Notched	• Dotted	• Feba 2	• Railroad	• Dot-dash	• Flot 1	• Wire	• Round-dot	• Flot 2	• ZigZag
• Solid	• Border	• Flot 3														
• Dashed	• Feba	• Notched														
• Dotted	• Feba 2	• Railroad														
• Dot-dash	• Flot 1	• Wire														
• Round-dot	• Flot 2	• ZigZag														
Symbol Outline	Unit Symbol outline frame width (in pt).															
Reinf./Red.	Text modifier for a unit symbol, indicating whether the unit is reinforced.															
Render Text on Surface	Select to snap the text to the same plane as the ground.															
Rotation	Rotation angle (in degrees) to rotate the object.															
Rounds per Minute	Artillery rounds per minute based on the values available in the drop-down.															
Target Type	Target shape. Can be: <ul style="list-style-type: none">• Point• Linear• Rectangular															
Text	Defended location marker text.															
Text	Objective text.															

Text	Text to appear.
Time	Phase Line time (in the format hh:mm). <div style="border: 2px solid red; padding: 5px; margin-top: 10px;"> WARNING Tactical Units should not cross the Phase Line until the specified time.</div>
Time on Target	Time when the first artillery projectile hits the target (in the format hh:mm).
Unique Designation	Text modifier for units, equipment, and installations, which uniquely identifies a particular symbol or track number.
Unique Designation	Area name.
Unique Designation	Decision Point name.
Unique Designation	Observation Post name.
Width	Target width (in meters).
Width / Length	Object width / length (in meters).

15. Create Custom ORBATS

You can create a custom ORBAT (Order of Battle) to place as Tactical Units in VBS Plan, using the ORBAT Editor (see the VBS4 Editor Manual).

This how-to describes using the ORBAT Editor to create an example ORBAT consisting of a GB Squad with two Fireteams, and the resulting JSONC files.

WARNING

The backwards compatibility of this how-to is not guaranteed, and the specification may change in future releases of VBS4. For older and / or deprecated ORBAT definitions, see the VBS4 23.1 version of this topic.

The ORBAT example workflow is as follows:

1. [Create the Fireteam ORBATS \(below\)](#)
2. [Create the Squad ORBAT \(on page 251\)](#)
3. [Place the Squad ORBAT in the Scenario \(on page 253\)](#)

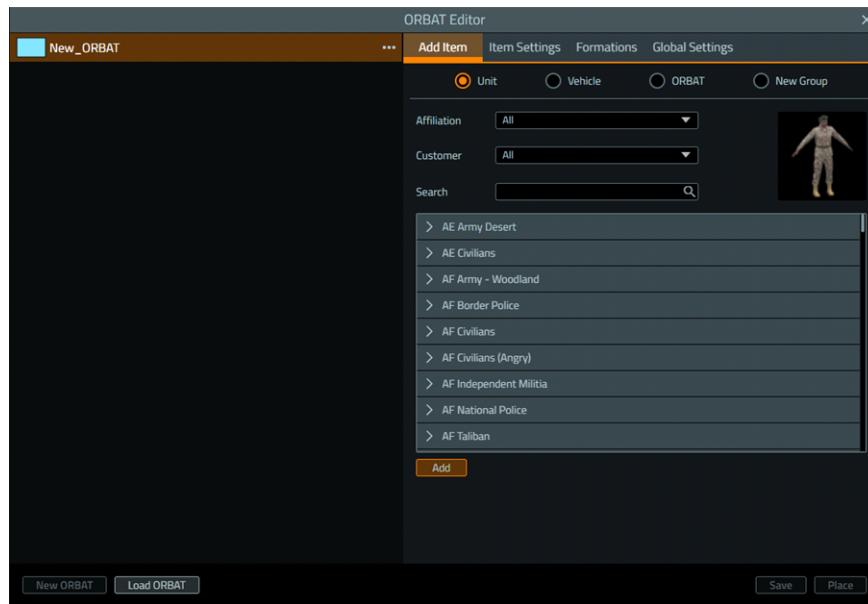
The ORBAT Editor creates JSONC files that represent the ORBAT, see [ORBAT JSONC Files \(on page 254\)](#).

15.1 Create the Fireteam ORBATS

First, create the Fireteam ORBAT for your Squad ORBAT (create the first Fireteam, and then make a second one out of the first with several modifications).

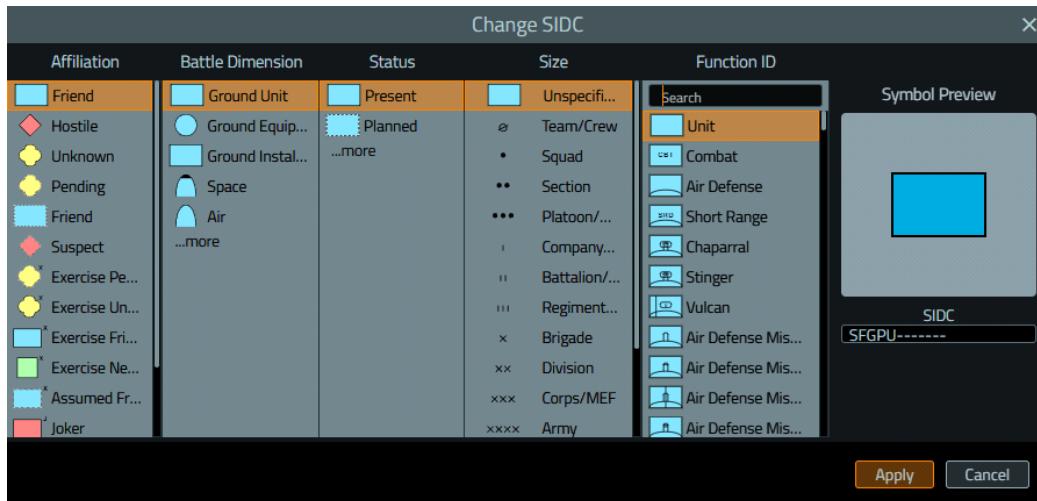
In VBS Plan or VBS Editor, open the **Tools** menu and select **ORBAT Editor**.

The ORBAT Editor opens, displaying the ORBAT Tree on the left, and ORBAT Settings on the right.



Change the SIDC:

- In **Item Settings > SIDC**, click **Change** to open the Change SIDC dialog.



- In the **Size** column, select **Team/Crew**, and in the **Function ID** column, select **Infantry**, then click **Apply**.

The SIDC and symbol of the Fireteam ORBAT changes.

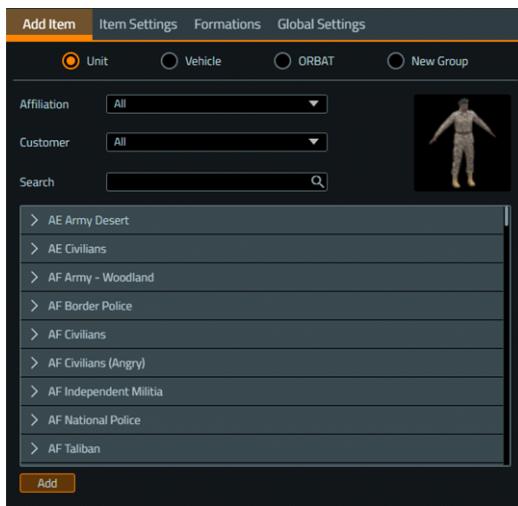


Add Units to the Fireteam:

- In the **New_ORBAT** row, click the **Ellipsis icon**, and select **Add Unit**.



The **Add Item** tab opens, with **Unit** selected.



2. In the **Customer** drop-down, select **UK Customer**.

This narrows down the number of displayed units to only show UK units.

3. In **Search**, type **section**.

This narrows down the number of displayed units, to match your search string.

4. Select **GB Army MTP > Section Commander** and click **Add**.

The Section Commander unit is added to your ORBAT. The **Chevron icon** indicates that the unit is a leader.



NOTE

Any first unit added to a group automatically becomes the group leader.

5. Repeat step 3, but search for **marksman**, and select **GB Army MTP > Marksman**, then click **Add**.

The Marksman unit is added to your ORBAT.

6. Repeat step 3, but search for **grenadier**, and select **GB Army MTP > Grenadier**, then click **Add**.

The Grenadier unit is added to your ORBAT.

7. Repeat step 3, but search for **rifleman**, and select **GB Army MTP > Rifleman**, then click **Add**.

The Rifleman unit is added to your ORBAT.

Modify the Rifleman Loadout:

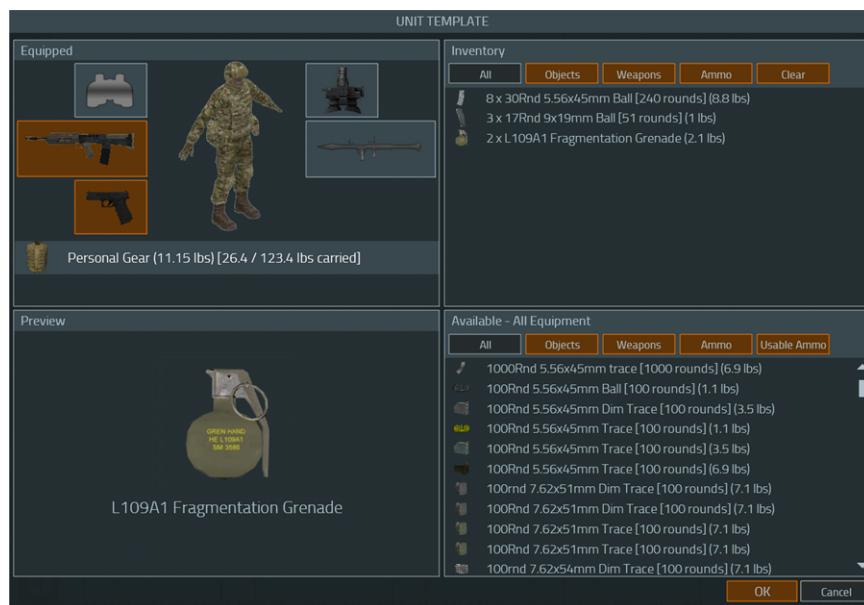
1. Click **Editor** in the VBS4 Toolbar (see the Introduction to VBS4 Guide).

NOTE

It is not possible to change the loadout with **Plan** selected in the VBS4 Toolbar.

- With the Rifleman unit selected in the ORBAT Tree, select the **Item Settings** tab, and in **Loadout**, click **Change**.

The Unit Template panel opens.



- In the **Available - All Equipment** panel, select **Weapons**, and click anywhere in the panel.

This displays all the available weapons for the unit.

- Type **MBT-LAW**, until the list is shortened and the **MBT-LAW** weapon is selected.
- Drag the **MBT-LAW** into the Secondary Weapon slot.



The unit is now equipped with the **MBT-LAW** weapon.

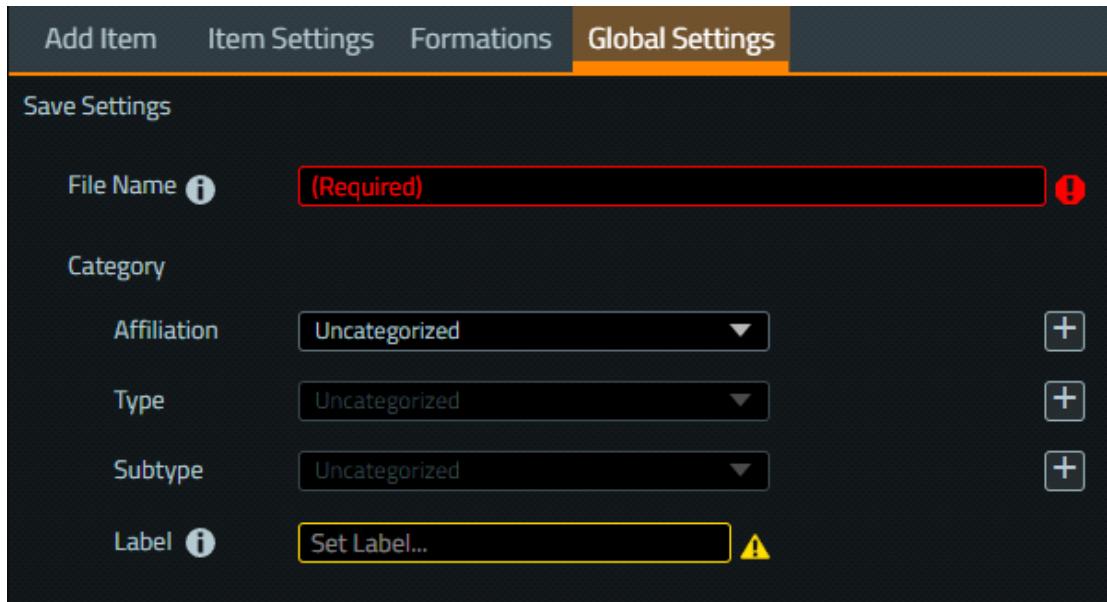
- In the **Available - All Equipment** panel, select **Usable Ammo**, and click anywhere in the panel.
 - This displays all the usable ammunition that the unit can have (based on equipped weapons).
 - Type **MBT-LAW**, until the list is shortened and the **MBT-LAW-HEAT** ammunition is selected.
 - Drag the **MBT-HEAT-LAW** to the **Inventory** panel.
 - In the **How Many?** dialog, enter 1 and click **OK**.
- One **MBT-LAW-HEAT** missile is added to the unit inventory / loadout.
- Click **OK** to confirm.

Update the ORBAT:

- With the Rifleman unit selected in the ORBAT Tree and the **Item Settings** tab selected, in **Description**, enter **Rifleman - L85A3 - NLAW**.

This changes the Rifleman unit name to **Rifleman - L85A3 - NLAW** in the ORBAT Tree.

- Open the **Global Settings** tab and modify the **Save Settings** in the following steps.



- In **File Name**, enter the ORBAT file name as **gb_fireteam_a**.
- In the **Affiliation** drop-down, select **GB**.
- In the **Type** drop-down, select **Ground Unit**.
- In **Subtype**, click the **Plus icon**.



The Name and Symbol fields appear.

- In **Name**, enter **Infantry**.
 - In **Symbol**, click **Change** to open the Change SIDC dialog - repeat step 2 of the main procedure, to set the symbol.
- In **Label**, enter **Fireteam A**.
 - Click **Save**.

The Fireteam A ORBAT is created and saved.

Create a Second Fireteam by Using the First One:

1. Select the **Marksman** unit in the ORBAT Tree, click the **Ellipsis icon**, and select **Delete**.
2. Select the **Section Commander** unit in the ORBAT Tree, click the **Ellipsis icon**, and select **Duplicate**.

Another Section Commander is added to the ORBAT.

3. Select the duplicate Section Commander in the ORBAT Tree, select the **Item Settings** tab, and in **Type**, click **Change**.

NOTE

The duplicate Section Commander does not have the **Chevron icon**, as he is not the actual leader of the group.

The Change Type dialog opens.



4. In **Customer**, select **UK Customer**, if not selected already.

5. In **Search**, enter **gpmg**, select **GB Army MTP > Gunner, GPMG** and click **OK**.

The Section Command unit type is changed to GPMG Gunner.

6. Select the **Global Settings** tab and modify **Save Settings** in the following steps.
7. In **File Name**, enter **gb_fireteam_b**.
8. In **Label**, enter **Fireteam B**.
9. Click **Save**.

The Fireteam B ORBAT is created and saved.

The first and second Fireteams are created and can now be combined into a Squad - see [Create the Squad ORBAT \(below\)](#).

15.2 Create the Squad ORBAT

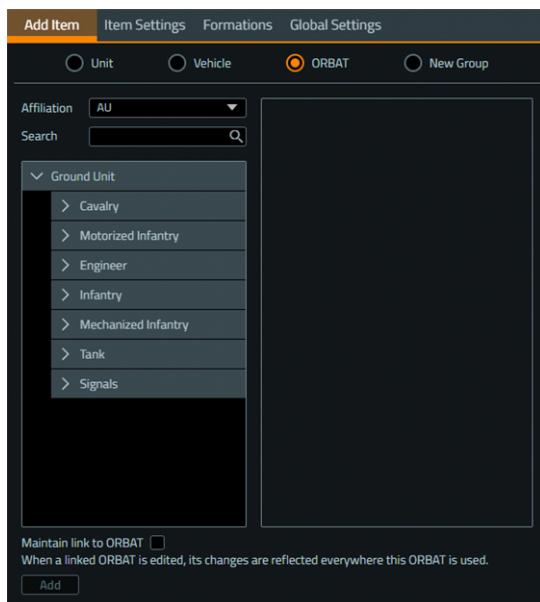
After creating the two Fireteams (two ORBATS), combine them into a Squad (new ORBAT).

Follow these steps:

1. In the ORBAT Editor, click **New ORBAT**.

ORBAT Editor creates a new (empty) ORBAT.

2. Select the **Add Item** tab, and select **ORBAT**.



3. In the **Affiliation** drop-down, select **GB**.

4. Expand **Ground Unit > Infantry**, and select **Fireteam A**.

5. Click **OK**.

The Fireteam A ORBAT is added to the new Squad ORBAT.

6. Repeat steps 2 - 5, but in the step 4, select **Fireteam B**.

The Fireteam B ORBAT is added to the new Squad ORBAT.

7. Select the **New_ORBAT** row in the ORBAT Tree, select the **Item Settings** tab, and in **SIDC**, click **Change**.

The Change SIDC dialog opens.

8. In the **Size** column, select **Squad**, and in the **Function ID** column, select **Infantry**, then click **Apply**.

The SIDC and symbol of the Squad ORBAT changes.



9. Save the Squad ORBAT:

- a. Open the **Global Settings** tab and modify the **Save Settings** in the following steps.
- b. In **File Name**, enter the ORBAT file name as **gb_squad1**.
- c. In the **Affiliation** drop-down, select **GB**.
- d. In the **Type** drop-down, select **Ground Unit**.
- e. In the **Subtype** drop-down, select **Infantry**.
- f. In **Label**, enter **Squad**.
- g. Click **Save**.

The Squad ORBAT is saved.

The Squad ORBAT is created, containing two Fireteam ORBATS.

gb_squad1	...
gb_fireteam_a	...
Section Commander - L85A3 - Virtus 1, PRR	...
Marksman - L129A1 - Virtus 1, PRR	...
Grenadier - L85A3 GLM - Virtus 1, PRR	...
Rifleman - L85A3 - NLAW	...
gb_fireteam_b	...
Section Commander - L85A3 - Virtus 1, PRR	...
Gunner, GPMG - L7A2 - Virtus 1, PRR	...
Grenadier - L85A3 GLM - Virtus 1, PRR	...
Rifleman - L85A3 - NLAW	...

Next, [Place the Squad ORBAT in the Scenario \(on the next page\)](#).

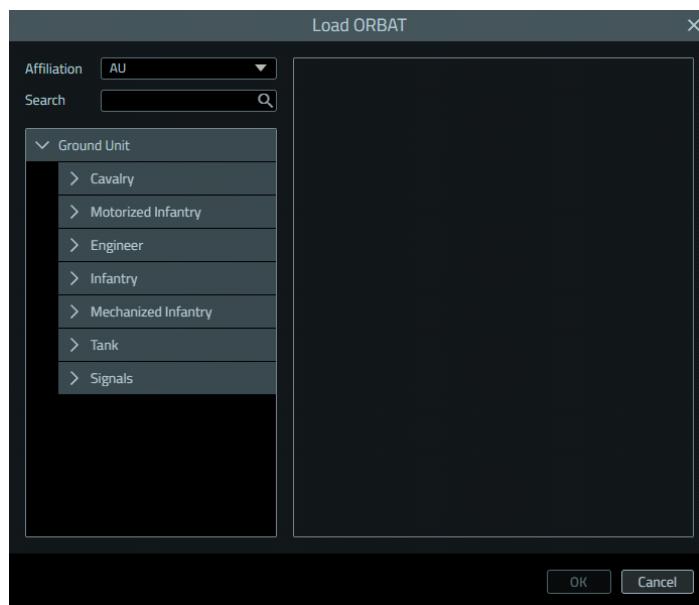
15.3 Place the Squad ORBAT in the Scenario

Now that the Squad ORBAT is created, you can place its units in the scenario, either using the ORBAT Editor directly, when in VBS Editor, or from VBS Plan.

Placement using the ORBAT Editor in VBS Editor:

1. In the ORBAT Editor, if the Squad ORBAT is not already loaded (if it is loaded, skip to step 1.d of this procedure), load it first by clicking **Load ORBAT**.

The Load ORBAT dialog opens.



2. In the **Affiliation** drop-down, select **GB**.
3. In **Ground Unit > Infantry**, select **Squad**, and click **OK**.

The Squad ORBAT is loaded.

4. Select the **Global Settings** tab and modify the **Placement Settings**.
5. If you want to make the Squad units playable, toggle **Playable** to be on.
6. Click **Place**.
7. Click a location on the map, where you want to place the Squad.

The Squad units are placed on the map.

Placement using VBS Plan:

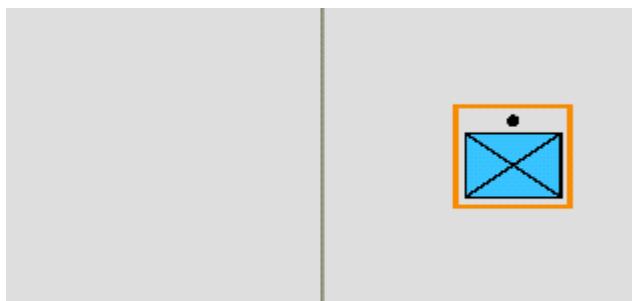
1. Use the [Units Tool \(on page 57\)](#), until you get to step 3 in [Create a Tactical Unit Object \(on page 58\)](#).

The Tactical Units table opens.

2. In the **Affiliation** column, select **GB**.

3. In the **Type** column, select **Ground Unit**.
4. In the **Subtype** column, select **Infantry**.
5. In the **Label** column, select **Squad**.
6. Click **Place**.
7. Click a location on the map, where you want to place the Squad.

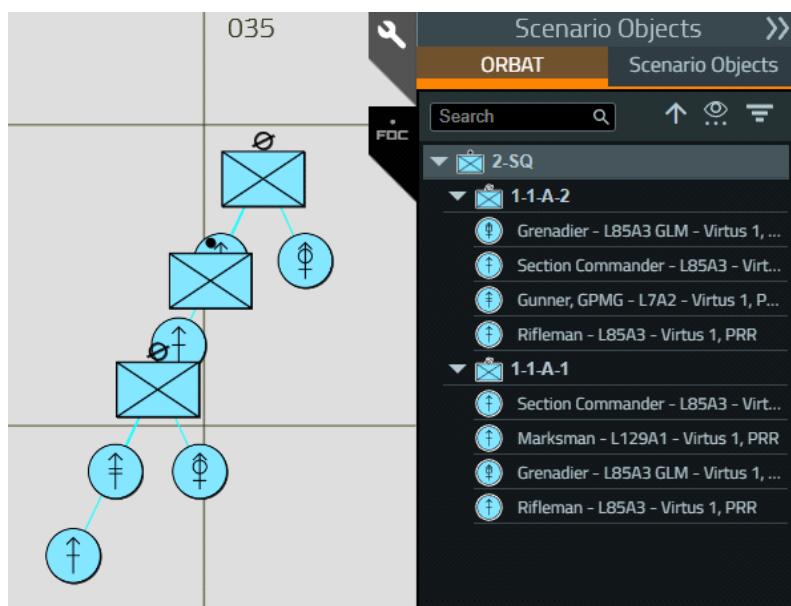
The Squad Tactical Unit object is placed on the map.



8. Click **Build Mission** (see [Build Missions \(on page 224\)](#)) to convert the Squad Tactical Unit object into VBS Editor units.

The Squad units are placed on the map.

Image-30: Squad units in the VBS Editor



15.4 ORBAT JSONC Files

The ORBAT Editor creates JSONC files that represent the ORBAT.

For general information on the JSONC ORBAT parameters, see [ORBAT Parameters \(on page 260\)](#).

ORBAT Editor saves the JSONC files at:

\Documents\VBS4\Doctrine\

The files in the `\Doctrine\` folder for this example are (they may be other ones, if other custom ORBATs are defined):

- `gb_fireteam_a.jsonc` - Fireteam A ORBAT.
- `gb_fireteam_b.jsonc` - Fireteam B ORBAT.
- `gb_squad1.jsonc` - Squad ORBAT.
- `\Categories\AllCategories.jsonc` - All the categories used by the ORBAT Editor. This file is created because the **Infantry** custom **Subtype** was introduced in the example.

The `gb_fireteam_a.jsonc` file has the following structure:

```
{  
    "UnitSymbols" :  
    [  
        {  
            "category" :  
            {  
                // Category Affiliation in the ORBAT Editor UI  
                "affiliationAlias" : "GB",  
                // Category Type in the ORBAT Editor UI  
                "battleDimensionAlias" : "Ground Unit",  
                // Category Subtype in the ORBAT Editor UI  
                "functionIdAlias" : "Infantry",  
                /* Fireteam A name, as it appears in some parts of the ORBAT Editor  
                   and the VBS Plan (Tactical Units table) UI  
                */  
                "sizeAlias" : "Fireteam A"  
            },  
            "composition" :  
            [  
                // Fireteam A composition (the definitions of Fireteam A units)  
            ],  
            "leaderIndex" : 0,  
            "name" : "gb_fireteam_a",  
            "sidc" : "SFGPUCI----A",  
            "unitSymbolData" :  
            {  
                "affiliation" : "friend",  
                "battleDimension" : "ground unit",  
                "function_id" : "armor track",  
                "size" : "section"  
            }  
        }  
    ],  
}
```

```
    "Version" : 1  
}
```

The `gb_fireteam_b.jsonc` file has the following structure:

```
{  
  "UnitSymbols" :  
  [  
    {  
      "category" :  
      {  
        // Category Affiliation in the ORBAT Editor UI  
        "affiliationAlias" : "GB",  
        // Category Type in the ORBAT Editor UI  
        "battleDimensionAlias" : "Ground Unit",  
        // Category Subtype in the ORBAT Editor UI  
        "functionIdAlias" : "Infantry",  
        /* Fireteam B name, as it appears in some parts of the ORBAT Editor  
           and the VBS Plan (Tactical Units table) UI  
        */  
        "sizeAlias" : "Fireteam B"  
      },  
      "composition" :  
      [  
        // Fireteam B composition (the definitions of Fireteam B units)  
      ],  
      "leaderIndex" : 0,  
      "name" : "gb_fireteam_b",  
      "sfdc" : "SFGPUCI----A",  
      "unitSymbolData" :  
      {  
        "affiliation" : "friend",  
        "battleDimension" : "ground unit",  
        "function_id" : "armor track",  
        "size" : "section"  
      }  
    }  
  ],  
  "Version" : 1  
}
```

The `gb_squad1.jsonc` file has the following structure:

```
{  
  "UnitSymbols" :  
  [  
    {
```

```
{  
    "category" :  
    {  
        // Category Affiliation in the ORBAT Editor UI  
        "affiliationAlias" : "GB",  
        // Category Type in the ORBAT Editor UI  
        "battleDimensionAlias" : "Ground Unit",  
        // Category Subtype in the ORBAT Editor UI  
        "functionIdAlias" : "Infantry",  
        /* Squad name, as it appears in some parts of the ORBAT Editor  
           and the VBS Plan (Tactical Units table) UI  
        */  
        "sizeAlias" : "Squad"  
    },  
    "composition" :  
    [  
        // Reference to the Fireteam A composition (in gb_fireteam_a.jsonc)  
        "gb_fireteam_a",  
        // Reference to the Fireteam B composition (in gb_fireteam_b.jsonc)  
        "gb_fireteam_b"  
    ],  
    "name" : "gb_squad1",  
    "sidc" : "SFGPUCI----B",  
    "unitSymbolData" :  
    {  
        "affiliation" : "friend",  
        "battleDimension" : "ground unit",  
        "function_id" : "armor track",  
        "size" : "section"  
    }  
},  
],  
"Version" : 1  
}
```

The `\Categories\AllCategories.jsonc` file has the following structure:

```
{  
    "Categories" :  
    [  
        ...  
        {  
            "affiliationAlias" : "GB",  
            "battleDimensions" :  
            [  
                ...  
            ]  
        }  
    ]  
}
```

```
{  
    "battleDimensionAlias" : "Ground Unit",  
    "functionIds" :  
    [  
        {  
            "functionIdAlias" : "Light Role Infantry",  
            "icon" : "",  
            "sidc" : "SFGPUCI----"  
        },  
        {  
            "functionIdAlias" : "Light Mechanized Infantry",  
            "icon" : "",  
            "sidc" : "SFGPUCIM----"  
        },  
        {  
            "functionIdAlias" : "Mechanized Infantry",  
            "icon" : "",  
            "sidc" : "SFGPUCIZ----"  
        },  
        {  
            "functionIdAlias" : "Armor",  
            "icon" : "",  
            "sidc" : "SFGPUCA-----"  
        },  
        {  
            "functionIdAlias" : "Armoured Cavalry",  
            "icon" : "",  
            "sidc" : "SFGPUCATL---"  
        },  
        {  
            "functionIdAlias" : "Light Cavalry",  
            "icon" : "",  
            "sidc" : "SFGPUCRRL---"  
        },  
        /* The Squad custom Infantry Category Subtype, as it appears in  
           some parts of the ORBAT Editor and VBS Plan (Tactical Units  
           table) UI  
        */  
        {  
            "functionIdAlias" : "Infantry",  
            "icon" : "",  
            "sidc" : "SFGPUCI----"  
        }  
    ],  
    "icon" : "",  
    "sidc" : "SFGPU-----"  
}
```

```
  ],
  "icon" : "",
  "sidc" : "SFGPU-----"
},
...
]
}
```

You can find the full example of the JSONC files in the HTML version of this topic.

15.5 ORBAT Parameters

The JSONC ORBAT parameters are used when creating custom ORBATs (see [Create Custom ORBATs \(on page 245\)](#)).

ORBAT Editor saves the JSONC files at:

`\Documents\VBS4\Doctrine\`

WARNING

The following considerations apply:

- Bohemia Interactive Simulations does not advise changing the ORBAT parameters directly, and recommends using the ORBAT Editor instead (see ORBAT Editor in the VBS4 Editor Manual), to create ORBATs using the VBS4 UI.
- The backward compatibility of this how-to is not guaranteed, and the specification may change in future releases of VBS4. For older and / or deprecated ORBAT definitions, see the VBS4 23.1 version of this topic.
- The JSONC file also contain a definition of the ORBAT formation. However, due to its complexity, changing them directly in the file is risky and not recommended by Bohemia Interactive Simulations. Modifying formations can be done using the ORBAT Formations Editor (see the VBS4 Editor Manual).

The parameters are divided into the following sections:

- [Compositions \(below\)](#)
- [UnitSymbols \(on page 265\)](#)
- [Roles \(on page 267\)](#)
- [Behaviors \(on page 268\)](#)
- [UnitSymbolData \(on page 269\)](#)
- [Category \(on page 270\)](#)
- [Categories \(on page 270\)](#)

15.5.1 Compositions

Parameter	Type	Description
<code>name</code>	String	Unique identifier of the unit.
<code>role</code>	String	Role the unit takes in the AI behavior. Usage depends on the behavior used.

Parameter	Type	Description
<code>composition</code>	Array (Composition Entry (on the next page) / String)	Composition Entry (on the next page), that can contain a Unit (on page 263) / Vehicle (on page 264), or a Group (on the next page). Alternatively, use the <code>name</code> (on the previous page) parameter.
<code>equipment</code>	Array (String)	If creating a mixed group of vehicles and troops, vehicle entities can be added here. Use the <code>name</code> (on the previous page) parameter in a similar fashion to <code>composition (above)</code> parameter.
<code>leaderIndex</code>	Integer	Index of the leader group or entity position in the <code>composition (above)</code> array.

Examples

Example `name`:

```
"name": "GB_Army_LightInfantry_Platoon"
```

Example `role`:

```
"role": "IFVsection"
```

Example `composition`:

```
"composition": [
    "GB_Army_LightInfantry_Platoon_H",
    "GB_Army_LightInfantry_Section",
    "GB_Army_LightInfantry_Section",
    "GB_Army_LightInfantry_Section"
]
```

Example `equipment`:

```
"equipment": [ "M2A3" ]
```

Example `leaderIndex`:

```
"leaderIndex": 0
```

15.5.1.1 Composition Entry

A Composition Entry can be a Group, a Unit, or a Vehicle.

15.5.1.1 Group

Parameter	Type	Description
<code>type</code>	Integer	Must be 0, for Group.
<code>sidc</code> (Optional)	String	SIDC string of a MIL-2525C symbol that represents the Group.
<code>description</code> (Optional)	String	Description of the Group (see Description in Adding Groups in the VBS4 Editor Manual).
<code>composition</code>	Array (Composition Entry of Group / Unit (on the next page) / Vehicle (on page 264))	Group sub-groups / units / vehicles.

Examples

Example `type`:

```
"type": 0
```

Example `sidc`:

```
"sidc": "SAGPU-----"
```

Example `description`:

```
"description": "Vehicle in Group"
```

Example `composition`:

```
"composition": [
  {
    "class": "vbs_au_army_leader_amcu_m_medium_tbas0_none_ef88_helmet",
    "sidc": "SFGPEWRR----",
    "type": 1
  },
  {
    "class": "vbs_au_army_machinegunner_amcu_m_medium_tbas0_none_f89_helmet",
    "sidc": "SGPPEWRR----"
  }
]
```

```

    "sidc": "SFGPEWRR----",
    "type": 1
},
...
]

```

15.5.1.1.2 Unit

Parameter	Type	Description
<code>class</code>	String	Unit class name.
<code>type</code>	Integer	Must be 1, for Unit.
<code>sidc</code> (Optional)	String	SIDC string of a MIL-2525C symbol that represents the Unit.
<code>description</code> (Optional)	String	Description of the Unit (see Description in Adding Units in the VBS4 Editor Manual).
<code>urn</code> (Optional)	String	Unit Reference Number (URN) of the Unit (see URN Marking in Adding Units in the VBS4 Editor Manual).
<code>loadout</code> (Optional)	Array (String)	Unit loadout. The weapons and ammunition are specified as nested Arrays of String.

Examples

Example `class`:

```
"class": "vbs_au_army_leader_amcu_m_medium_tbao0_none_ef88_helmet"
```

Example `type`:

```
"type": 1
```

Example `sidc`:

```
"sidc": "SFGPEWRR----"
```

Example `description`:

```
"description": "Unit in Vehicle"
```

Example `urn`:

```
"urn": "BG134"
```

Example **loadout**:

```
"loadout": [
    [
        ["\\"vbs_dvs_xx_9K310_Igla\\", \"vbs2_usmc_baton\\"],
        [
            "\\"vbs2_mag_30rnd_762x39_Ball_akm\\", "\\"vbs2_mag_30rnd_762x39_Ball_akm\\",
            "\\"vbs2_mag_30rnd_762x39_Ball_akm\\", "\\"vbs2_mag_30rnd_762x39_Ball_akm\\",
            "\\"vbs2_mag_30rnd_762x39_Ball_akm\\", "\\"vbs2_mag_rgnfrag\\",
            "\\"vbs2_mag_rgnfrag\\", "\\"vbs2_mag_baton_poke\\",
            "\\"vbs2_mag_baton_strike\\", "\\"vbs2_mag_baton_push\\"
        ],
        [],[],[],"\\"vbs2_af_borderPolice_d_akm\\",true
    ]
]"
```

15.5.1.1.3 Vehicle

Parameter	Type	Description
class	String	Vehicle class name.
type	Integer	Must be 2, for Vehicle.
sidc (Optional)	String	SIDC string of a MIL-2525C symbol that represents the Vehicle.
description (Optional)	String	Description of the Vehicle (see Description in Adding Vehicles in the VBS4 Editor Manual).
urn (Optional)	String	Unit Reference Number (URN) of the Vehicle (see URN Marking in Adding Vehicles in the VBS4 Editor Manual).
composition	Array (Composition Entry of Unit (on the previous page))	Vehicle crew units.

Examples

Example **class**:

```
"class": "vbs_au_army_untrooper_amcu_m_medium_tbas0_none_ef88_cap"
```

Example **type**:

```
"type": 2
```

Example **sidc**:

```
"sidc": "SFGPUCAWL---"
```

Example **description**:

```
"description": "Vehicle in Group"
```

Example **urn**:

```
"urn": "AG134"
```

Example **composition**:

```
"composition" :  
[  
  {  
    "class":  
      "vbs2_af_ana_grenadier_w_m16_m203",  
    "description": "Unit in Vehicle",  
    "type": 1  
  }  
]
```

15.5.2 UnitSymbols

Parameter	Type	Description
name	String	Unique identifier of the unit.
sidc	String	SIDC string of a MIL-2525C symbol that represents the unit.
role	String	Role this unit takes in the AI behavior. Usage depends on the behavior used.
behaviors	String	Behavior the unit should use (as defined in "Behaviors").
rangeRings	Object	Distances of range rings shown in VBS Plan.
unitSymbolData	Object	Unit symbol data, which is displayed in the Tactical Units table columns.
composition	Array (Composition Entry (on page 262) / String)	Composition Entry (on page 262) , that can contain a Unit (on page 263) / Vehicle (on the previous page) , or a Group (on page 262) . Alternatively, use the name (above) parameter.
equipment	Array (String)	Unit equipment.

Parameter	Type	Description
<code>category</code>	Object	Category assignation.
<code>leaderIndex</code>	Integer	Index of the leader group or entity position in the composition (on page 261) array.

Examples

Example `name`:

```
"name": "GB_Army_LightInfantry_Platoon"
```

Example `sidc`:

```
"sidc": "SFGPUCI----D"
```

Example `role`:

```
"role": "IFVsection"
```

Example `behaviors`:

```
"behaviors": "platoon_infantry"
```

Example `rangeRings`:

```
"rangeRings": {
    "inner": 200,
    "outer": 400
}
```

Example `unitSymbolData`:

```
"unitSymbolData": {
    "affiliation": "Friend",
    "battleDimension": "Ground Unit",
    "function_id": "Infantry",
    "size": "Team/Crew"
}
```

Example `composition`:

```
"composition": [
    "GB_Army_LightInfantry_Platoon_HO",
```

```
"GB_Army_LightInfantry_Section",
"GB_Army_LightInfantry_Section",
"GB_Army_LightInfantry_Section"
]
```

Example **equipment**:

```
"equipment": ["M2A3"]
```

Example **category**:

```
"category":
{
  "affiliationAlias": "British Army",
  "battleDimensionAlias": "Ground Unit",
  "functionIdAlias": "Infantry",
  "sizeAlias": "Rifle Fireteam (Machine Gunner)"
}
```

Example **leaderIndex**:

```
"leaderIndex": 0
```

15.5.3 Roles

Role	Echelon Level	Description
<code>teamLeader</code>	Individual	If the leader of a Squad is not part of any Fireteam, but in a separate team, it needs to be tagged with this role.
<code>vehicleDriver</code>	Individual	Lets the AI know that this member of the crew is the driver.
<code>Vehcle_Crew_Commander</code>	Individual	Lets the AI know that this member of the crew is the commander.
<code>Vehicle_Crew_Gunner</code>	Individual	Lets the AI know that this member of the crew is the gunner.
<code>BFV</code>	Equipment	Lets the AI know that this vehicle is an armored personnel carrier.
<code>atTeam</code>	Team	Designates a specialized anti-armor team.
<code>mgTeam</code>	Team	Designates a specialized machine gun team.
<code>weaponsTeam</code>	Team	Designates a team with special weapons capabilities.

Role	Echelon Level	Description
commandTeam	Team	If a Platoon has an HQ team, the team needs to be tagged with this role.
leaderTeam	Team	If a Squad has a team to contain the Squad leader separate from the Squad Fireteams, it needs to be tagged with this role.
AFV_mechanizedInfantry	Team	Designates an armored personnel carrier team (vehicle and crew).
IFVsection	Section	Designates an armored transport vehicle section (just the crews and vehicles, not the infantry).
leaderSquad	Squad	If a Platoon has an HQ Squad, then the Squad needs to be tagged with this role.
weaponSquad	Squad	If an infantry Platoon has a separate Squad for AT and MG teams, it should be tagged with this role.

15.5.4 Behaviors

Bohemia Interactive Simulations provides a number of generic military behavior sets that can be used to control different kinds of ORBAT. Behaviors are only necessary on standalone units. Compositions that are part of higher echelon groups have their behaviors assigned to them by their parent group. If a composition has a special purpose inside its larger unit, it is important that it has the correct role assigned (see [Roles \(on the previous page\)](#)) so that the parent behavior knows what special behaviors to assign to it.

Behavior	Description
team_infantry	Group behaves as a Fireteam of riflemen and grenadiers.
squad_infantry	Group behaves as a rifle Squad composed of two or more Fireteams, and up to one leadership team (which might just contain the Squad leader). If present, the leadership team and the Squad leader itself must have the teamLeader (on the previous page) role.
platoon_infantry	Group behaves as a rifle Platoon, typically with three rifle Squads. It may also contain an HQ Squad (with a leaderSquad (above) role, and an inner team with commandTeam (above) role), and / or a weapons Squad (with a weaponSquad (above) role, and sub-team roles of either atTeam (on the previous page) or mgTeam (on the previous page)).
platoon_infantry_mechanized	Group behaves as a rifle Platoon with attached armored transport vehicles. The infantry rides in the transport, and disembarks to perform assault operations. Typically contains three rifle Squads and one or more IFV sections (vehicles must have enough cargo seat space for all the infantry).

Behavior	Description
<code>section_tank</code>	Group composed of one or more vehicle crews. Vehicle crews must be defined as a separate composition. If this is an IFV section, it needs to be assigned the IFVsection (on the previous page) role, and each vehicle crew role must be AFV_mechanizedInfantry (on the previous page).
<code>platoon_tank</code>	Group composed of one or more vehicle sections.

15.5.5 UnitSymbolData



WARNING

All parameters must match the MIL-2525C definitions.

Parameter	Type	Description
<code>affiliation</code>	String	Affiliation descriptor.
<code>battleDimension</code>	String	Battle Dimension descriptor.
<code>function_id</code>	String	Function ID descriptor.
<code>size</code>	String	Size / echelon descriptor.

Examples

Example `affiliation`:

```
"affiliation": "Friend"
```

Example `battleDimension`:

```
"battleDimension": "Ground Unit"
```

Example `function_id`:

```
"function_id": "Infantry"
```

Example `size`:

```
"size": "Team/Crew"
```

15.5.6 Category

Parameter	Type	Description
<code>affiliationAlias</code>	String	Affiliation alias the unit is displayed in, as defined in the Category object.
<code>battleDimensionAlias</code>	String	Battle Dimension alias the unit is displayed in, as defined in the Category object.
<code>functionIdAlias</code>	String	Function ID alias the unit is displayed in, as defined in the Category object.
<code>sizeAlias</code>	String	Size alias the unit is displayed in, as defined in the Category object.

Examples

Example `affiliationAlias`:

```
"affiliationAlias": "British Army"
```

Example `battleDimensionAlias`:

```
"battleDimensionAlias": "Ground Unit"
```

Example `functionIdAlias`:

```
"functionIdAlias": "Light Infantry"
```

Example `sizeAlias`:

```
"functionIdAlias": "Light Infantry"
```

15.5.7 Categories

Parameter	Type	Description
<code>affiliationAlias</code>	String	Name of the Faction, Affiliation, or Service.
<code>battleDimensionAlias</code>	String	Name of the Battle Dimension or similar category.
<code>functionIdAlias</code>	String	Name of the Function ID or similar category.
<code>sidc</code>	Boolean	SIDC string of the MIL-2525C symbol to display. Used in Affiliation, Battle Dimension, and Function ID.

Parameter	Type	Description
<code>icon</code> (Optional)	String	PNG image to display in place of the MIL-2525C symbol. Used in Affiliation, Battle Dimension, and Function ID.
<code>battleDimensions</code>	Array (Object)	Contains the Battle Dimensions.
<code>functionIds</code>	Array (Object)	Contains the Function IDs.

Examples

Example `affiliationAlias`:

```
"affiliationAlias": "British Army"
```

Example `battleDimensionAlias`:

```
"battleDimensionAlias": "Ground Unit"
```

Example `functionIdAlias`:

```
"functionIdAlias": "Light Infantry"
```

Example `sidc`:

```
"sidc": "SFGPU-----"
```

Example `icon`:

```
"icon": ""
```

Example `battleDimensions`:

```
"battleDimensions": [
  {
    "battleDimensionAlias": "Ground Unit",
    "sidc": "SFGPU-----",
    "icon": "",
    "functionIds": [
      {
        "functionIdAlias": "Light Infantry",
        "functionId": 1
      }
    ]
  }
]
```

```
        "sidc": "SFGPUCI-----",
        "icon": ""
    }
]
}
]
```

Example **functionIds**:

```
"functionIds":
[
    {
        "functionIdAlias": "Light Infantry",
        "sidc": "SFGPUCI-----",
        "icon": ""
    }
]
```