VBS Call for Fire

VBS4 24.1.1

Bohemia Interactive SIMULATIONS

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1. VBS Call for Fire Overview

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

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

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

FEATURE NOTICE

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

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

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

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

  WARNING

  Placing vehicle and ship mounted weaponry when you Create Gunlines (on page 23) also adds the corresponding vehicle / ship model to the scenario. Therefore, it is not necessary to add vehicle and ship models separately.
- Target worksheet allows pre-planned target reference points and mission targets.

- Flexible mission creation:
  - See and create gunlines and fire missions specifically for BLUFOR or OPFOR sides.
  - Timed, proximity, impact, and delay fuses.
  - Targeting types: Polar, Grid, Shift, Recorded.
  - Distribution patterns: Circle, Linear, Open, Range, Lateral, Range Lateral, Parallel, and Convergence.
  - Fine control over gun behavior:
    - Fire When Ready / At My Command
    - Fire With and Follow By
    - Check Fire
    - High / Low Trajectory
  - Adjust Fire behavior for mission adjustment.
  - Record Trainee reports such as Target Description for After-Action Review (AAR).
- Detailed statistical info in both the real-time exercises and AAR.
  - Trajectory, Vertex, and Target symbology.
  - Mission Report with Time of Flight, Gun-Target Line, Angle T, Range, and other ballistic and mission information.
  - Automatically generated Message To Observer.
- The Fire Scheduling Plan makes it easy to pre-plan fire missions for automatic execution (see Fire Scheduling Plan (on page 15) in the VBS Call for Fire Manual).

There are three roles for successful CFF mission execution:

- **Scenario Designer**

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

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

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

- **Forward Observer (FO)**

  The Trainee on the ground, communicating with the FDC Operator to request fire missions. The FO passes target coordinates to the FDC Operator using VBS Radio or other communication methods.

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

1.1 VBS Call for Fire Workflow

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

Follow this process:

1. Prepare a scenario in VBS4.

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

   For more information, see VBS Call for Fire Scenario Execution (on page 12).
3. Review Trainee performance.

   For more information, see VBS Call for Fire in AAR (on page 56).

During VBS Call for Fire Scenario Preparation (on the next page) and VBS Call for Fire Scenario Execution (on page 12) use the Fire Direction Center to manage VBS Call for Fire operations:

Follow this process:

1. Access the FDC UI.

   For more information, see VBS Call for Fire - FDC UI (on page 13).
2. Place gunlines on the map.

   For more information, see Gunline Management (on page 22).
3. Place TRPs on the map.

   For more information, see Target Management (on page 31).
4. Use the functions in the Fire Mission panel to create and manage fire missions.

   For more information, see VBS Call for Fire Mission Management (on page 34).

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

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

1.2 VBS Call for Fire Scenario Preparation

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

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

Follow these steps:

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

   NOTE

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

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

   WARNING

   If you intend to use vehicle / ship mounted weaponry, it is not necessary to add the corresponding vehicle / ship to the scenario, as this is done automatically when you Create Gunlines (on page 23) and select a Gun Type (on page 25).

   NOTE

   CFF does not support the Advanced Ballistics setting in VBS4.

5. Use the Gunlines Details panel to add gunlines and targets to the scenario, and configure scheduled fire missions:

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

   a. Configure gunlines, and place them on the map, see Gunline Management (on page 22).

   b. Create targets, and place them on the map, see Target Management (on page 31).

   c. Configure scheduled fire missions, see VBS Call for Fire Mission Management (on page 34).

6. To preview your scenario press **Scenario Preview** (**H**) or click **Preview**.

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

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

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

   - Edit the scenario as an Administrator to play test different scenarios. Press **Map** (**M**), or press **Pause** (**Esc**) and select **Editor**, to open VBS Editor in Execute mode. For information about Execute mode in Call for Fire, see VBS Call for Fire Scenario Execution (on page 12).

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

   - Return to Prepare mode to continue editing the scenario. Press **Pause** (**Esc**) and select **End Battlespace**.

7. To save your scenario click the **Main Menu** in the VBS4 Toolbar, and under **Battlespaces** select one of the following options:

   - **Save** - Saves changes into the currently open Battlespace.
   - **Save As** - Creates a new Battlespace, or overwrites the existing one, based on the name you enter in the dialog.

A saved scenario is available for use:

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

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

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

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

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

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

1.3 VBS Call for Fire Scenario Execution

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

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

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

A typical Scenario Execution use case requires a Dedicated Server to host the mission with the Administrator operating an Admin Client on the same network. For more information, see Dedicated Server Scenario Execution in the VBS4 Instructor Manual.

Follow these steps:

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

   The Scenario Starts and displays the Mission Briefing view.

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

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

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

Administrators can record scenarios to enable later performance analysis, see VBS4 After Action Review in the VBS4 AAR Manual for details. VBS Call for Fire has a specific UI for use with AAR, which is discussed in VBS Call for Fire in AAR (on page 56).

2. VBS Call for Fire - FDC UI

Access the Fire Direction Center (FDC) UI for VBS Call for Fire from the VBS4 Editor, and use it to place gunlines and targets, process target coordinates, create fire missions, and collate fire mission data. It also stores previously configured fire missions, targets, and gunlines.

> **TIP**
>
> If you are an advanced user, it is possible to configure the ammunition, fuses, and guns available in the FDC UI to your specific requirements, see VBS Call for Fire UI Configuration (on page 58) for more information.

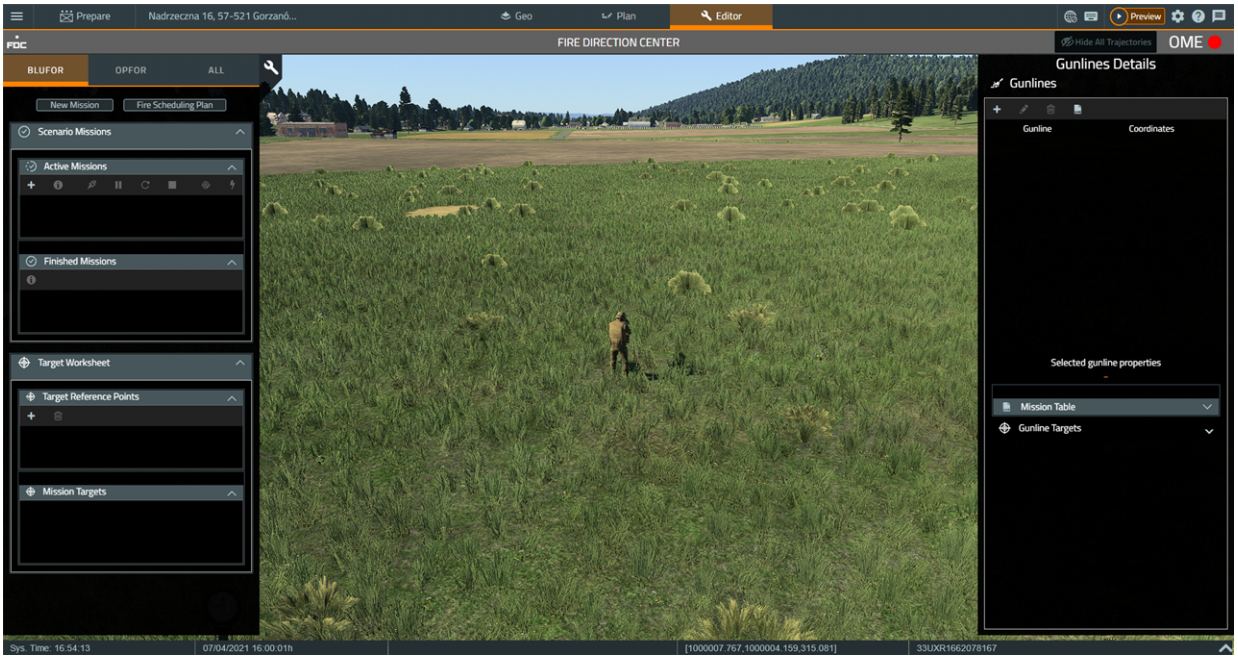
Click the **FDC** tab to open the FDC UI.

The following panels appear on either side of the screen:

- Gunlines Details Panel (on the next page) - This panel appears on the right, and includes the functions for adding, editing, and deleting gunlines.

  > **NOTE**
  >
  > Adding gunlines is the first step in the Call for Fire workflow.

- Main FDC Panel (on page 15) - This panel appears on the left, and has functions for creating a new fire mission, and managing any pre-existing ones.



Above the Gunlines Details panel, there is a toolbar with a button at the top-right which you can use to **Hide All Trajectories**.

Click this button to clear all trajectories from the scenario. This is useful since showing a very large number of trajectories in the UI may impact performance.

To exit the FDC UI, click the **Spanner** tab.

> **NOTE**
>
> You must exit the FDC UI in order to access the VBS Editor Main Menu options.

2.1 Gunlines Details Panel

Use this panel to create and manage gunlines, including loadouts, that are available in the scenario. These functions are described in Gunline Management (on page 22).

> **NOTE**
>
> Gunlines should be added before a new fire mission is created.

At the top of the Gunlines Details panel are the following controls:

Button	Description
	Use to create a gunline, see Create Gunlines (on page 23).
	Use to edit a gunline, see Edit Existing Guns and Gunlines (on page 29).
	Use to delete a gunline, see Delete Existing Guns and Gunlines (on page 30).
	Click to open the Mission Table (on page 42).

2.2 Main FDC Panel

At the top of the **Main FDC** panel are the following tabs:

- **BLUFOR** - Allows you to create and see all fire missions for BLUFOR scenario participants only.
- **OPFOR** - Allows you to create and see all fire missions for OPFOR scenario participants only.
- **ALL** - Allows you to see all fire missions for BLUFOR and OPFOR sides in the scenario.

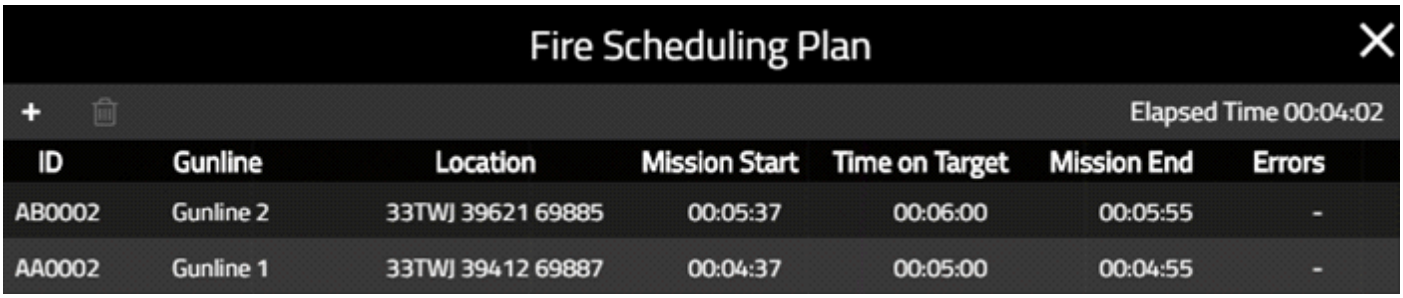
The BLUFOR and OPFOR tabs have the following buttons at the top:

New Mission

Click to Create a Fire Mission (on page 34).

Fire Scheduling Plan

Click to open the Fire Scheduling Plan dialog, which contains a list of planned fire mission entries. These are configured during fire mission creation, see Create a Fire Mission (on page 34).



The dialog has the following features:

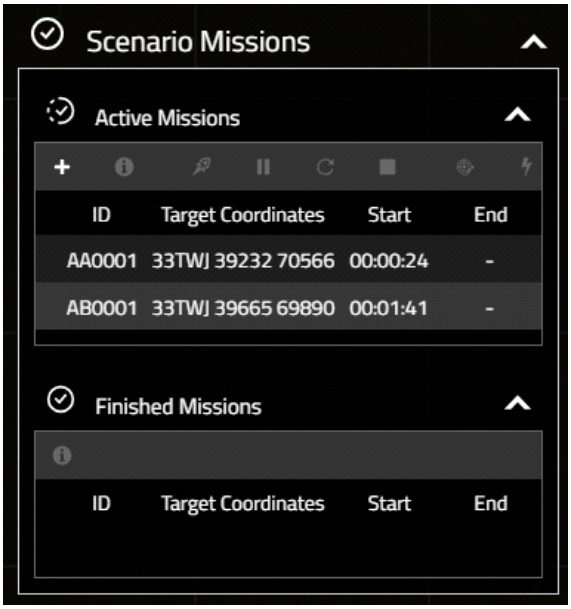
Feature	Description
	Click to open the **Fire Mission** panel, and create a new fire mission.

Feature	Description
	Click an entry in the list, so that it is highlighted, and click this button to delete it. The planned fire mission is deleted from the list and the scenario, and can never become **Active** or **Finished**.
Elapsed / Mission Time	Clock that shows the current time as the Elapsed Time or Mission Time, depending on the time format set. For more information, see Synchronize Time in the VBS4 Editor Manual.
ID	Mission ID.
Gunline	Gunline name / number.
Location	TRP and Target location coordinates.
Mission Start	Scheduled fire mission start time.
Time on Target	The time at which the first round should impact the target, see Time on Target (on page 35).
Mission End	Scheduled fire mission end time.
Errors	An error warning icon is shown if the mission fails. Hover over the icon to read the list of errors.

The rest of the main FDC panel is divided into the following sections:

Scenario Missions

This section lists the currently **Active** and **Finished** fire missions.



Active Missions

Select a **fire mission** entry in this list, so that it is highlighted, and use the following buttons to edit and control an existing fire mission. Creation of new fire missions is also possible here:

Control	Description
	**Create** Click to open the **Fire Mission** panel, and create a fire mission (duplicates the **New Mission** button function).
	**Mission Report** Click to open the Mission Report Panel (on page 19).
	**Fire Guns** Click to instruct the guns to fire when they are ready. Active if **At My Command** is selected during mission creation (see Create a Fire Mission (on page 34)).
	**Check Fire** Click to pause the mission.
	**Repeat Mission** Repeats the last mission instruction given.
	**End Mission** Click to end the mission.
	**Adjust Fire** Click to open the Adjust Fire dialog. Not available for **Fire for Effect** type missions.
	**Fire for Effect** Click to open the Fire Mission panel.

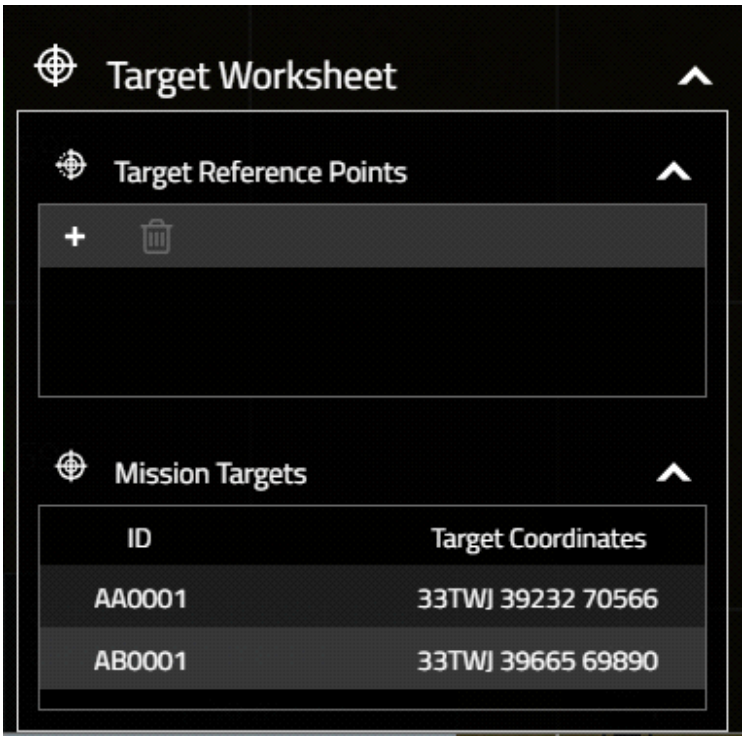
Finished Missions

Select a **fire mission** entry in this list, so that it is highlighted, click the **Mission Report** button to access the Mission Report Panel (on page 19), and view data about the selected fire mission.

> **NOTE**
>
> Finished fire missions cannot be edited or repeated. They are purely for the purpose of VBS Call for Fire in AAR (on page 56) .

Target Worksheet

Use the functions in this section to create, edit, and adjust targets. For more information, see Target Management (on page 31).



Volleys

Each time you click **Repeat Mission** / **Adjust Mission > OK**, a new chronological "instruction" entry is added to the Ballistic Information (Volleys) list in the Mission Report Panel (on the next page), below the previous instruction.

When using Adjust Fire mission types, the FDC Operator typically fires multiple volleys to test the accuracy of the target information, and makes any necessary adjustments. Once they are confident that they can destroy the target, the FDC Operator switches to Fire for Effect for the final bombardment.

2.3 Mission Report Panel

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

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

- Active Missions (see Active Missions (on page 17) in the VBS Call for Fire Manual).
- Finished Missions (see Finished Missions (on page 17) in the VBS Call for Fire Manual).

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

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

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

Ballistic Information (Volleys)

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

Volley

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

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

3. Gunline Management

Gunlines are created as the first step of creating a fire mission. They are managed in the **Gunlines Details** panel, the right-hand panel on the FDC UI.

Controls at the top of the panel enable you to create new gunlines. You may also edit or delete previously created gunlines listed in this panel. Vehicle mounted guns are also configured in the **Gunlines Details** panel.

WARNING

Placing more that 10 gunlines may cause performance issues.

Guns must not be placed inside or on top of terrain objects such as buildings or rocks, otherwise they do not function correctly.

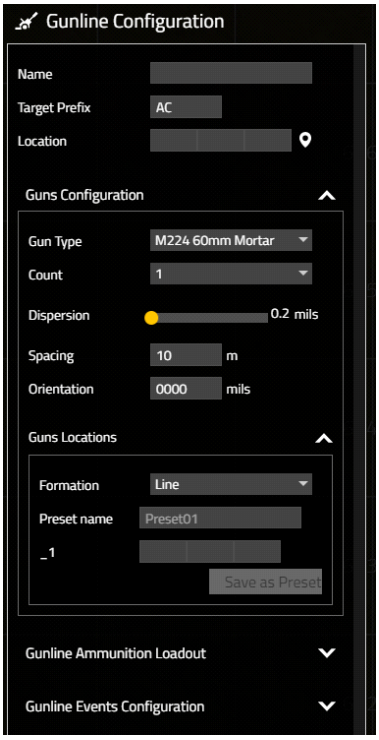
NOTE

The guns and their crew can not be damaged, destroyed, repaired, grouped, switched to (the gunners themselves are not playable), towed, hitched, or assigned waypoints. The gun coordinates can be changed, but only by the Administrator / Instructor.

Select from the following topics to set up and manage gunlines:

3.1 Create Gunlines

Gunlines are created in the **Gunline Configuration** panel, accessed from the Gunlines Details panel.



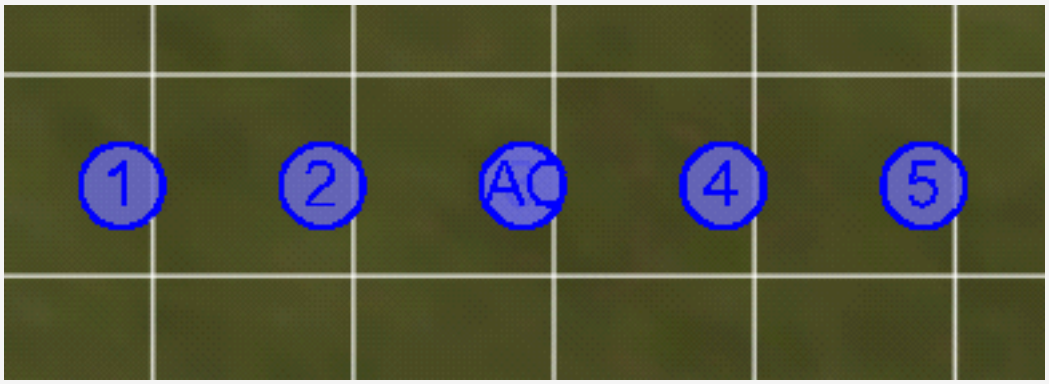
Follow these steps:

1. In the Main FDC panel (left panel), do one of the following:
   - Click the **BLUFOR** tab.
   - Click the **OPFOR** tab.

   > **NOTE**
   > Gunlines previously added to the scenario for BLUFOR and OPFOR appear in the Gunlines Details panel, and can be modified (see Edit Existing Guns and Gunlines (on page 29)).

2. In the **Gunlines Details** panel click the **plus** icon in the Gunlines List to open the **Gunline Configuration** panel.

3. Enter the following information:

Setting	Description
Name	**Required**. Enter a name for the gun / gunline. **WARNING** The permitted symbols (up to 11) are letters, numbers, and spaces. Punctuation marks, such as apostrophes and quotation marks are not supported.
Target Prefix	Pre-filled target prefix of missions supported by this gunline, which automatically increments when a new gunline is created. **NOTE** The same prefix is used at the beginning of the Mission ID of the mission the gunline is assigned to. You can manually change the ID to a two-letter prefix, if necessary.
Location	Required. Enter the gunline location coordinates (specifically, those of the first gun in the line), using one of the following methods: • **Manual** - Type the MGRS coordinates into the **Location** field. • **Automatic** - Click the **locator**, and click the map where you want to place the center of the gunline.  The coordinates are automatically entered into the **Location** field. A preview of the gunline is shown on the map, for example: 

4. In the **Guns Configuration** section, enter the following information.

Setting	Description
Gun Type	Use the drop-down to select from the available gun types. **NOTE** It is not possible to mix Gun Types in a gunline. **WARNING** Some guns are vehicle / ship mounted. Placing these Gun Types automatically adds the corresponding vehicle / ship to the scenario.
Count	Use the drop-down to select the number of guns you want in the gunline, or vehicles / ships with mounted guns. **NOTE** This selection causes the **Guns Locations** section to be populated with a list of all the guns in the gunline, or vehicles / ships, with their coordinates. Gun names are incremented automatically with number suffixes.
Dispersion	Use the slider to select a dispersion setting (in milliradians) to simulate inaccuracy. This setting creates a random offset of the guns in a gunline, up to the value entered. Each time the guns fire, there is an average of 1 meter target inaccuracy, per milliradian, per 1000 meters of range. The degree of inaccuracy is increased by entering a higher value.
Spacing	Enter a value (in meters) of the space you want between each gun. The default setting is 10 m.
Orientation	Enter the orientation of the guns (in milliradians). Gunlines are set at 0000 milliradians by default, and their orientation is in an East-West line.

5. In the **Gun Locations** section, enter the following information.

Setting	Description
Formation	Click the drop-down to select one of the following options: • **Line** - The guns are placed in a fixed line on the map. Some parameters can be adjusted, see Dispersion (on the previous page). • **Custom** - The guns are placed in a line on the map, but their location coordinates can be changed to create a customized formation, see *GunName_0 (below)*. • ***Preset*** - If available, select a Custom formation which was saved previously as a Preset. **NOTE** **Line** formation gunlines cannot be saved as presets. **Custom** formation gunlines can be saved as presets.
Preset Name	The option you select in the Formation (above) drop-down correlates to what is shown in the Preset Name field: • **Line** - The name is automatically filled, and cannot be changed. • **Custom / *Preset*** - The name is automatically filled, but you can type in the field to change it.
GunName_0	Displays the names and location coordinates for the individual guns. **NOTE** Gun names are incremented automatically with number suffixes. Location coordinates of individual guns can be changed for all Formation (above) types, including **Line**. For **Custom** and ***Preset*** gunlines, do one of the following: • Enter new MGRS coordinates in the field next to the gun you want to relocate. • Click the **locator** next to the specific gun you want to relocate, and click the map where you want to place it. The gun is relocated, and new MGRS coordinates are automatically added to the *GunName_0* field. For **Line** formation guns, use the functions described in Moving Gunlines (on page 28) to change the coordinates. If you do this, the formation type automatically changes from **Line** to **Custom**.
Save As Preset	Click this button to save the gunline formation as a Preset for later use.

6. In **Gunline Ammunition Loadout**, click **plus (+)** to add 100 shells, click **minus (-)** to remove 100 shells, click the **Clear** icon for 0 shells.

   Use the up / down arrows for finer adjustments, or type numbers in the fields.

   > **NOTE**
   >
   > The following considerations apply:
   >
   > - The maximum limit is 300 shells of each type.
   > - The 155 mm BONUS warhead requires that target vehicle engines are hot. If a target vehicle is standing idle, the BONUS round does not hit it. The target vehicle must either move or have the following script placed in the **Initialization Statements** field of its Object Properties dialog:
   >
   > ```
   > this engineOn true; this setVehicleTiPars [1, 0.3, 0];
   > ```

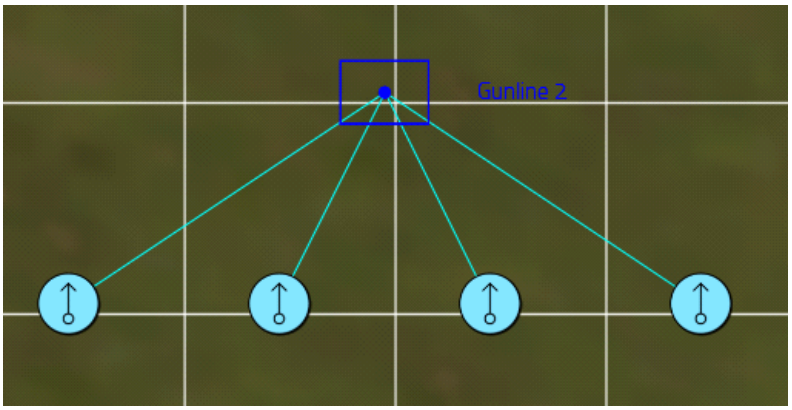
7. In the **Gunline Events Configuration** section, you can adjust the various stages of the loading / unloading process, by entering times in seconds in the corresponding fields. No process can take less than 1 second:

   - **Preparing**
   - **Attention**
   - **Laying**
   - **Loading**
   - **Unloading**
   - **Stowing**

   > **NOTE**
   >
   > If you end a fire mission, it moves from **Active** to **Finished**. However, you cannot use the gunline in a new fire mission until the unloading and stowing processes, configured in this section, have completed. Current processes are shown in the gunline **Status** column (see Gunline Data (on page 41)).

8. Click **Create**.

The Gunline Editor Object is placed on the map, with the individual guns linked to it.

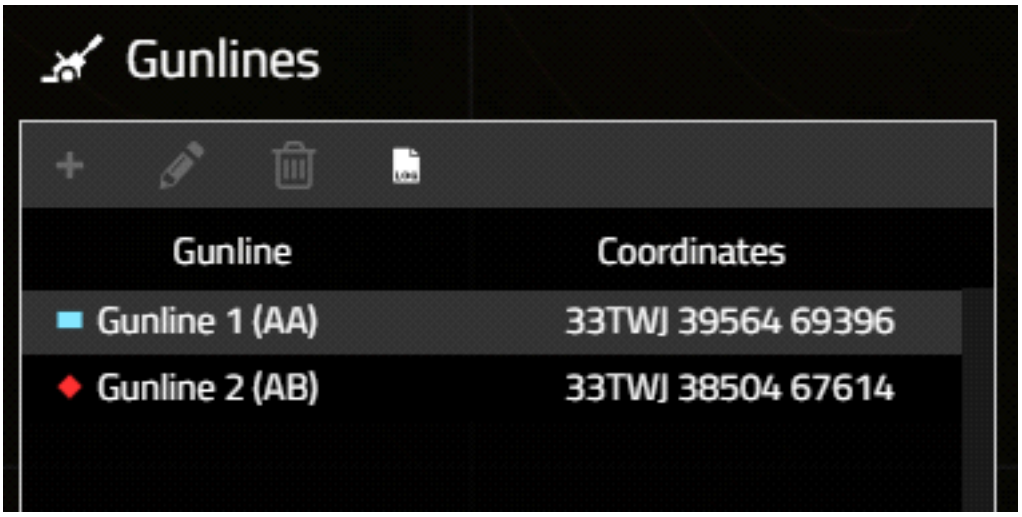


In addition, the gunline name and coordinates are added to the relevant list in the **Gunlines Details** panel:

- **BLUFOR** - Shows only gunlines configured specifically for BLUFOR.
- **OPFOR** - Shows only gunlines configured specifically for OPFOR.
- **ALL** - Shows gunlines configured for both BLUFOR and OPFOR.

To switch between the lists, click the **BLUFOR** / **OPFOR** / **ALL** tabs in the Main FDC panel.

The following screenshot shows the **Gunlines** list for **ALL** gunlines in the scenario, including one **BLUFOR** gunline (**blue** rectangle symbology), and one **OPFOR** gunline (**red** diamond symbology).



3.2 Moving Gunlines

If necessary, you can move the gunline to a new position.

Follow these steps:

1. Double-click the **Gunline EO**, so that the gunline and the EO are flashing.
2. Click and hold the **Gunline EO**.

3. Drag your mouse, so that the EO and the attached gunline move with your cursor.
4. Re-position the gunline, and click anywhere on the map to deactivate the moving mechanism.

The gunline is fixed in its new position.

> **NOTE**
> The **Formation** you selected / configured retains its layout, even if moved.

Alternatively, you can move individual guns to create your own custom formations.

Follow these steps:

1. Click and hold a single **gun** on the map.
2. Drag your mouse to move it.
3. When the gun is in position, release the **LMB**.
4. Repeat steps 1 to 3 for the other guns, if required.

The guns are in a custom formation.

3.3 Edit Existing Guns and Gunlines

Existing gunlines can be edited from the **Gunlines Details** panel.

> **NOTE**
> Gunlines that are assigned to Active Fire Missions (on page 40) cannot be moved or edited until the mission has finished.
>
> Changing the **Name** or **Gun Type** for an existing gunline causes all Scheduled Firing Plans for those gunlines to fail.

Follow these steps:

1. Click the **gunline** entry in the list that you want to edit, so that it is highlighted.
2. Click **Edit** to open the Gunline Configuration panel.

3. You can edit the following settings, which are updated as you change them:

    - **Name**
    - **Target Prefix**
    - **Location**
    - **Gun Type**
    - **Dispersion**
    - **Count**
    - **Formation**
    - **Ammunition Loadout**
    - **Events Configuration**

4. Click **Save** to save your edits.

3.4 Delete Existing Guns and Gunlines

Existing gunlines can be deleted from either the list in the Gunlines Details panel, or directly from the map.

> **NOTE**
>
> Gunlines that are assigned to Active Missions cannot be deleted until the mission has finished. See Active Fire Missions (on page 40) in the VBS Call for Fire Manual.

Do one of the following:

- Click the **entry** in the Gunlines Details panel of the gunline you want to delete (so that it is highlighted), and click the **trash** icon.

- Right-click the Gunline EO on the map, and select **Delete Object** from the context menu.

The gunline is removed from both the Gunlines Details panel, and the map.

3.5 Mission Table

Use the Mission Table to view a list all fire mission gunline assignments. Click the **expander** or **log** to open the full version of the Mission Table.

For more information, see Mission Table (on page 42) in VBS Call for Fire Mission Management (on page 34).

4. Target Management

Targets are managed in the Target Worksheet in the main FDC UI panel. There are two types of targets used for CFF missions:

- **Target Reference Points (TRP)**

  Targets that are placed on the map during scenario creation, or during scenario run-time. They are also generated by the Record Target during the fire mission.

- **Mission Targets**

  Created during the fire mission. Mission Targets are records of the coordinates at which the fire mission was initially aimed, and do not change if subsequent target adjustments are made. They are also generated by the Record Target.

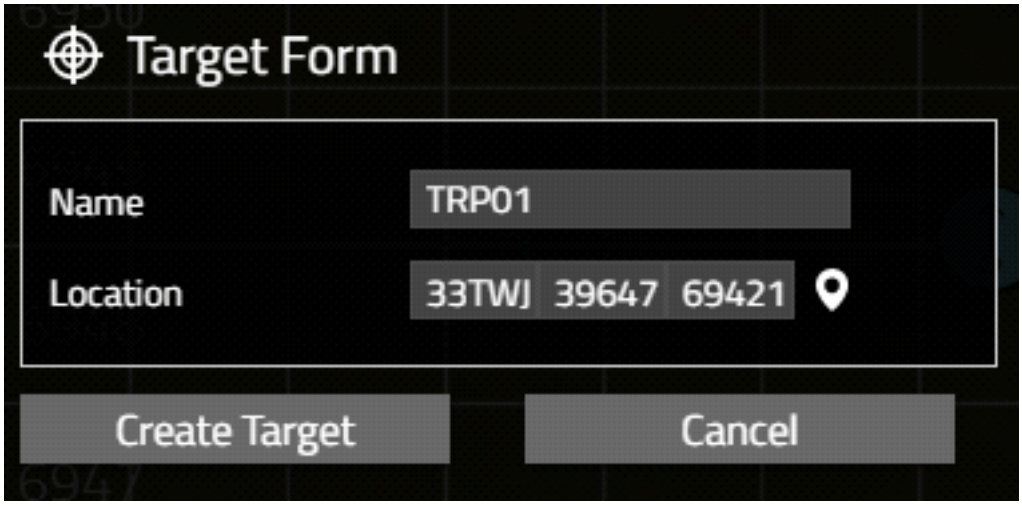
4.1 Creating TRPs

TRPs are created using the Target Form, which is accessed from the Target Reference Points list.

Follow these steps:

1. At the top of the Target Reference Points (TRP) list, click the **plus** icon to open the **Target Form**.

2. Enter a **Name** for your TRP (usually, TRP01 and so on).

   WARNING

   The permitted symbols (up to 11) are letters, numbers, and spaces. Punctuation marks, such as apostrophes and quotation marks are not supported.

3. Enter the **Location** coordinates of your TRP. Do one of the following:
   - Manually enter the MGRS coordinates into the **Location** fields.
   - Click the **locator**, and click the map where you want to place the TRP.

   The coordinates are automatically entered into the **Location** fields when you click the map.
4. Click **Create Target**.

The Target Editor Object is placed on the map, and the TRP name and coordinates are added to the TRP list.

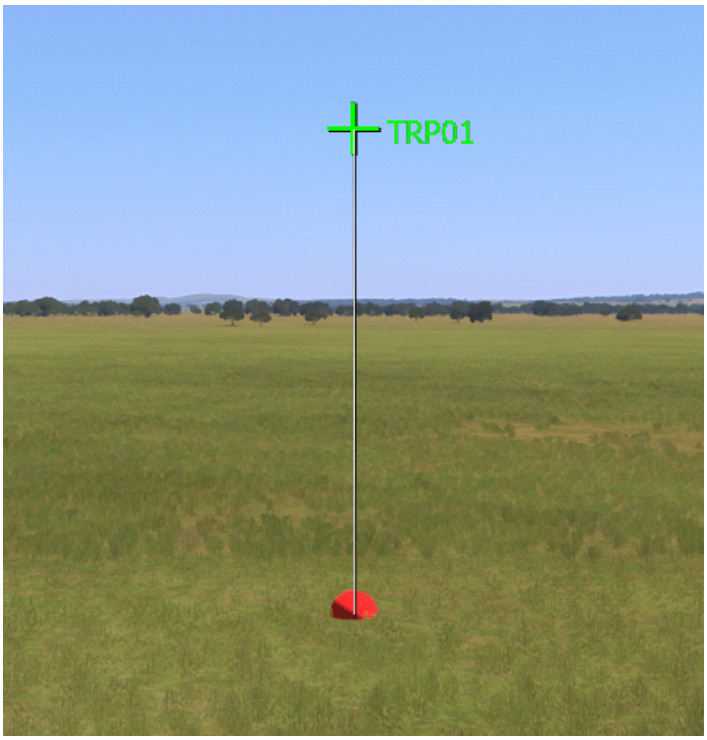
When a TRP is assigned to a mission, it also appears in the Mission Targets list. To assign a TRP, see Create a Fire Mission (on page 34) using the Recorded (on page 36) Target Location.

Image-1: TRP added to Mission Targets

The Target Editor Object appears as a red cross on the map, and includes a red hemisphere on the 3D map.

TIP

You can move the Target Editor Object around using your mouse (click and drag) for more accurate placing, or to make adjustments. Moving the Target Editor Object automatically adjusts the coordinates of the corresponding entry in the TRP list.



4.2 Deleting Targets

Targets can be deleted simultaneously from the map, and the TRP List.

Follow these steps:

1. Click an **entry** in the TRP List, so that it is highlighted **orange**.
2. Click the **trash** icon.

The target entry is removed from the TRP list, and the Target Editor Object is removed from the map. If the target was used in a mission, a corresponding entry remains in the Mission Targets list.

5. VBS Call for Fire Mission Management

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

Follow this process:

1. Set up a fire mission, see Create a Fire Mission (below).
2. Edit / adjust a fire mission, see Active Fire Missions (on page 40).
3. Monitor gunline activity, see Gunline Data (on page 41).

WARNING

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

5.1 Create a Fire Mission

Before creating a fire mission, create a gunline. Gunlines are created in the **Gunline Configuration** panel. For more information, see Gunline Management (on page 22). From the Main FDC panel, you can access the Fire Mission panel, used to create fire missions.

Image-2: Fire Mission panel

Follow these steps:

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

Setting	Description
FO	Use the drop-down to select a Forward Observer (FO) from the list of URN Markings or select **Enter FO Position Manually**, to enter coordinates for the FO.
Mission Type	Use the drop-down to select a mission type. See Mission Types (on page 44) for detailed descriptions of each mission type option.
Scheduled	Select to open Time on Target (below) fields to schedule a fire mission. **NOTE** Scheduled fire missions are the only type of missions that end automatically, without intervention from the FDC Operator.
Time on Target	Enter a specific time when the first round should impact the target. The fire mission automatically starts at a calculated length of time before the time you enter, which is necessary for the rounds to arrive on target and on time (the gunline procedures of Preparing, Attention, Laying, and Loading, followed by the time-in-the-air of the projectile, are taken into account). **NOTE** The Time on Target set relates to the Elapsed / Mission Time (below). How a fire mission starts can vary, depending on the **Method of Control**: • **Fire When Ready** - When the elapsed time is reached, the fire mission is added to Active Fire Missions (on page 40), and becomes active. The guns go through the configured procedures, and fire at the target. • **At My Command** - When the elapsed time is reached, the fire mission is added to Active Fire Missions (on page 40), and starts to play. However, the guns are only prepared for firing. They do not fire until the FDC Operator clicks **Fire Mission**. On fire mission completion, the mission entry in Active Fire Missions (on page 40) moves to Finished Missions.
Elapsed / Mission Time	Clock that shows the current time, depending on the time format set. For more information, see Synchronize Time in the VBS4 Editor Manual.

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

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

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

Setting	Description
Recorded	Select to use TRP coordinates from the Target Worksheet (see Target Management (on page 31)).
Grid	Select to enter new target coordinates, see Target Management (on page 31).
Shift	Select to select an existing target, and adjust the position of the gun barrels in relation to the target: • **Known Position** - Use the drop-down to select existing TRP coordinates. • **Direction (mil)** - Field available if no FO is assigned to the mission. Enter an angle in milliradians, to adjust the angle between North and the target. • **Left / Right** - Select the direction to move the **target**, and enter by how much in the field (meters). If using an FO, Left / Right is from their viewpoint. • **Add / Drop** - Move the **target** further away (**Add**) or closer (**Drop**) to the FO, and enter by how much in the field (meters). Add / Drop is from the viewpoint of the FO. • **Up / Down** - Move the **target** up / down (vertical adjustment), and enter by how much (meters). This setting adds meters above or below ground level. Guns normally aim at the target at ground level. Each additional shift is calculated from the last impact position, not the first target selected for the mission. An **^** / **v** arrow appears on the map with a number indicating meters relative to the ground.
Polar	Select to calculate the grid coordinates when a target is specified by reference to the FO position: • **Direction** - Enter the direction of the target (mils), relative to the angle between the FO and North. • **Distance** - Enter the distance from the FO to the target (meters). • **Up / Down** - Select to move the target point up / down, and enter by how much (meters). **WARNING** An FO (on the previous page) must be selected for this option to be available.

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

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

> **NOTE**
> The settings in this section have no simulation effect. They are included so that the FO can role-play reporting information about the target. The FDC Operator records information here, received from the FO, for later review. See also Role-Play (on page 48) for more information.

7. In **Distribution**, use the drop-down to select the Distribution Patterns (on page 50) you want.
8. In **Ammunition**, select from the following options:

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

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

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

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

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

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

11. **Optional:** Use the **Adjustments** options for informational purposes.
    - **Area / Precision** - Indicates if gunners should hastily cover an area, or take care to fire with precision. AI gunners always perform their tasks with ideal accuracy. To simulate inaccuracy, use the **Dispersion** setting when you create gunlines to adjust the accuracy of the gunline, or select the Circle pattern setting to cover a broad area in (see Create Gunlines (on page 23) in the VBS Call for Fire Manual).
    - **Mark** - **For exercise recording only, there is no simulation effect**. If checked, the FO can confirm that illumination rounds are bursting at the desired height and location. This option is available so that the FO and FDC Operator can role-play this step by recording the volley in which the desired effect was obtained, for later review.
    - **Danger Close** - **For exercise recording only, there is no simulation effect**. Indication given by the FO that friendly troops are near the target location. AI behavior does not change based on this parameter.

    > **NOTE**
    >
    > These settings have no simulation effect. They are included so that the FO can role-play reporting information about the target. The FDC Operator selects options here based on information provided by the FO, which is used for later review. See Role-Play (on page 48) for more details.

12. In **Method of Control**, use the drop-down to select from the following settings:
    - **Fire When Ready** - The guns fire shortly after the mission starts, depending on the timing configuration of gunline events.
    - **At My Command** - The guns fire when the FDC Operator clicks **Fire Mission** during Fire Mission Verification (on page 54).
13. In **Control Type**, use the drop-down to select from the following settings:
    - Continuous Fire
    - Continuous Illum
    - Coordinated Illum

    > **NOTE**
    >
    > Control Type settings have no simulation effect on their own, see Role-Play (on page 48) for more details.

14. Click **Process**.

    The CFF system checks the following and if all conditions are met, Fire Mission Verification (on page 54) occurs, which enables you to review the settings you configured:

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

5.2 Active Fire Missions

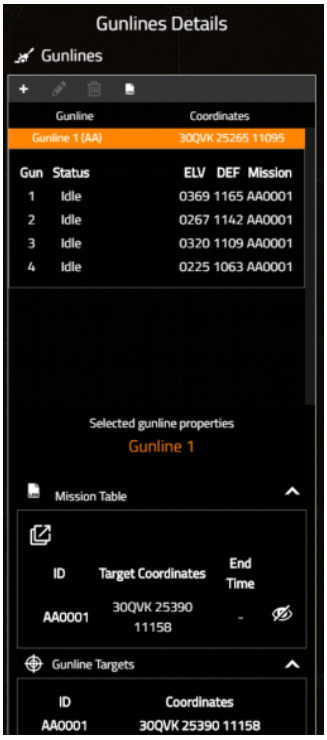
You can edit and control currently active fire missions using the buttons located at the top of the Active Missions list. Click the entry of the fire mission you want to edit / control in the list, so that it is highlighted, and the buttons are activated.

5.3 Gunline Data

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

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

Image-3: Expanded gunline entry



Data is shown in the following columns:

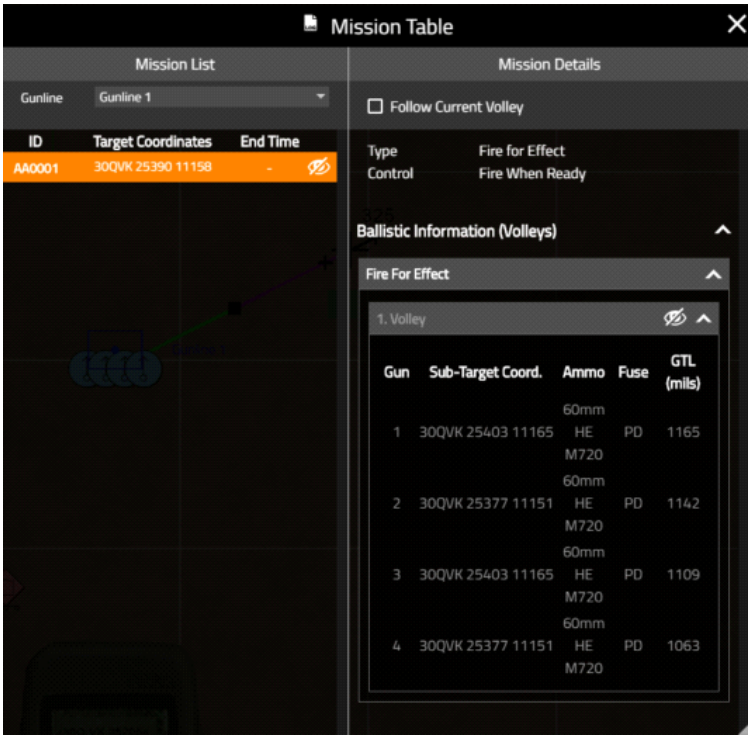
Column	Description
Gun	Numbered list of guns in the gunline.
Status	Displays the process statuses in real-time: Idle, Preparing, Attention, Laying, Loading, Fired, Unloading, Stowing.
ELV	Elevation of each gun in relation to the ground (milliradians).
DEF	Deflection, the rotation of each gun (milliradians).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

Further data is available in the tables that follow.

Mission Table

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

Image-4: Mission Table (full version)



The table has the following controls:

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

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

Mission List

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

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

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

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

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

Mission Details

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

- **Type** - Displays the Mission Type, see Mission Types (on the next page).
- **Control** - Displays gun behavior selected, see Create a Fire Mission (on page 34).
- **Ballistic Information (Volleys)** - Click the down arrows to display further data:
  - **Gun** - List of guns used for the volley.
  - **Sub-Target Coord** - Precise coordinates targeted.
  - **Ammo** - Ammunition used.
  - **Fuse** - Fuse type used.
  - **GTL (mil)** - Gun to Target Line direction in milliradians.
  - Show / hide trajectories for the individual volleys.

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

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

Gunline Targets

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

5.4 Mission Types

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

Mission Type	Description
Fire for Effect	Use when you know the exact coordinates of the target. **NOTE** Adjustments cannot be made to Fire for Effect missions. Use **Adjust Fire** if you expect to make adjustments to your fire mission.
Adjust Fire	Use when receiving target coordinates from an FO. This mission type enables you to quickly adjust coordinates during the mission, if necessary. **NOTE** Each adjustment creates new Volleys of the original mission.
Immediate Smoke	Use to quickly suppress a small target location with smoke to disorientate the enemy, or to conceal BLUFORs. The behavior of this Mission Type is similar to Fire for Effect. However, the Immediate Smoke mission type is recorded in the Mission Report, and is visible in VBS Call for Fire in AAR (on page 56). See Configure an Immediate Smoke Mission (on the next page).
Immediate Suppression	The behavior of this Mission Type is similar to Fire For Effect. However, Immediate Suppression missions are recorded in the Mission Report, and are visible in VBS Call for Fire in AAR (on page 56). See Configure an Immediate Suppression Mission (on page 46).
Record Target	Use to create a mission target (see Target Management (on page 31)) in Execute mode during run-time. **NOTE** The target position is not marked on the map. Even though the target ID is linked to a gunline, the guns do not fire for this type of mission. The Record Target mission target can be re-used in other missions. The following fields must be filled: • **Gunline** - Select a gunline, it is not necessary to select specific guns. • **Target Location** - See Target Management (on page 31).

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

Configure an Immediate Smoke Mission

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

Follow these steps:

1. Select the **Immediate Smoke** Mission Type.
2. Set the appropriate Time on Target (on page 35).

   NOTE
   Only required in Prepare mode.

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

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

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

A panel opens for Fire Mission Verification (on page 54).

Configure an Immediate Suppression Mission

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

Follow these steps:

1. Select the **Immediate Suppression** Mission Type.
2. Set the appropriate Time on Target (on page 35).

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

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

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

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

A panel opens for Fire Mission Verification (on page 54).

Configure a SEAD Mission

The following procedure explains how to configure a SEAD mission.

Follow these steps:

1. Use the Schedule Mission feature (see Fire Scheduling Plan (on page 15)) to select an appropriate **Time on Target**.
2. If an illumination marking round is required, select a second target using **Fire With**.
3. To achieve interrupted suppression times, use **Follow By** to specify a delay between fires, or you can schedule two SEAD missions (in the case that a marking round is required).
4. Click **Process**.

A panel opens for Fire Mission Verification (on page 54).

5.4.1 Fire Mission Control Variants

When you click **Start Mission** in the Fire Mission Verification (on page 54) panel, various button controls are made available. Which button controls are shown depends on the options you select during fire mission creation, and can include the following.

Setting	Description
Check Fire	Click to pause firing of the gunline. Click **Resume Fire** to fire the guns. **NOTE** Processes such as Preparing, Attention, Loading, Unloading, Stowing, Laying are not paused.
Fire Mission	Only available if the setting is **At My Command**.
Repeat Mission	Click to repeat the last fire instruction that was performed (assuming you have sufficient ammunition).
Adjust Mission	Available for all mission types (except **Record Target**). Click to re-open the **Fire Mission** panel, and make the following adjustments, if necessary: • Change the **FO**. • Change the **FO Position** (check **Enter FO Position Manually** and enter coordinates manually, or click the **locator**, and click the map where you want to place the FO) .  • Add / remove guns (from the same gunline). • In **Target Adjustment**, set a new target using the **Polar** targeting type (an FO position is require for this to work). • In **Target Adjustment**, set a new target using the **Shift** targeting type. • Change the **Distribution Pattern**. • Change the **Ammunition**. • Change the **Method of Engagement**. • Change the **Method of Control**.
Fire for Effect	Click to perform Fire for Effect, as the final stage of an Adjust Fire mission.
End Mission	Click to end the mission. The mission ends and an entry is added to Finished Missions. **NOTE** Finished missions cannot be repeated. They are only for the purpose of VBS Call for Fire in AAR (on page 56) in the VBS4 AAR Manual.

Setting	Description
Close Report	Click to close the verification panel, and return to the main FDC panel.

5.4.2 Role-Play

The Control Type drop-down in Method of Control (see Create a Fire Mission (on page 34)) contains the following "role-play" fire mission options:

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

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

Continuous Fire / Continuous Illum

Follow these steps:

1. Select **HE / ILLUM** rounds in the Gunline Ammunition Loadout (see Create Gunlines (on page 23)).
2. Specify a long **Duration** setting in Rounds to be Fired (see Create a Fire Mission (on page 34)).
3. In Control Type, select **Continuous Fire / Continuous Illum**.
4. Click **Process**.

Coordinated Illum

Follow these steps:

1. Select illumination rounds in the Gunline Ammunition Loadout (see Create Gunlines (on page 23)).
2. Select the desired pattern and number of guns to achieve illumination.
3. Select **Adjust Fire** in the Mission Type drop-down (see Create a Fire Mission (on page 34)).
4. After running Adjust Fire instructions to confirm that the target is correct, select **Mark** in Method of Engagement.
5. In the next fire instruction, select **At My Command** as the Method of Control, to enable the FDC Operator to choose the time to fire the illumination rounds.
6. Use the Fire Scheduling Plan (on page 15) in the VBS Call for Fire Manual to coordinate the firing of the Coordinated Illumination mission with a separate FFE mission, in which the Time on Target (on page 35) is specified.
7. Click **Process**.

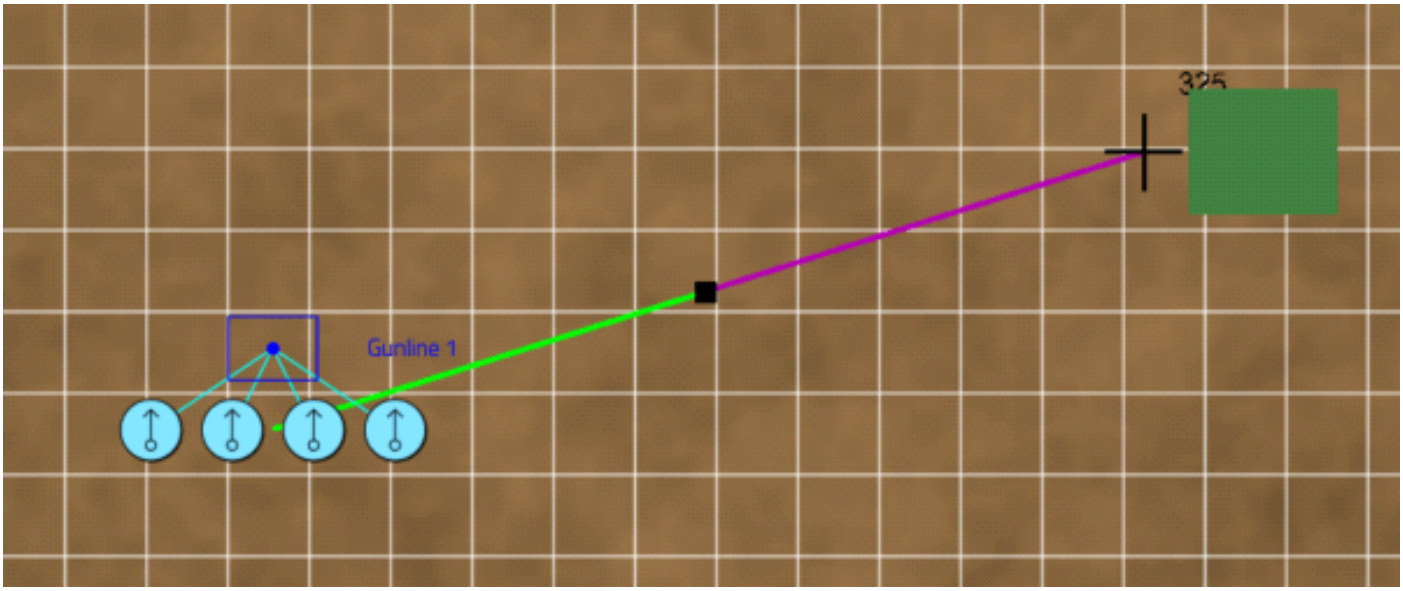
Image-5: Continuous Illumination mission

5.5 Distribution Patterns

This topic describes and illustrates the distribution patterns of fired rounds, configured in the Distribution section of the Fire Mission panel, see Create a Fire Mission (on page 34). The black **plus** symbols represent targets, sub-target aims, and impact points.

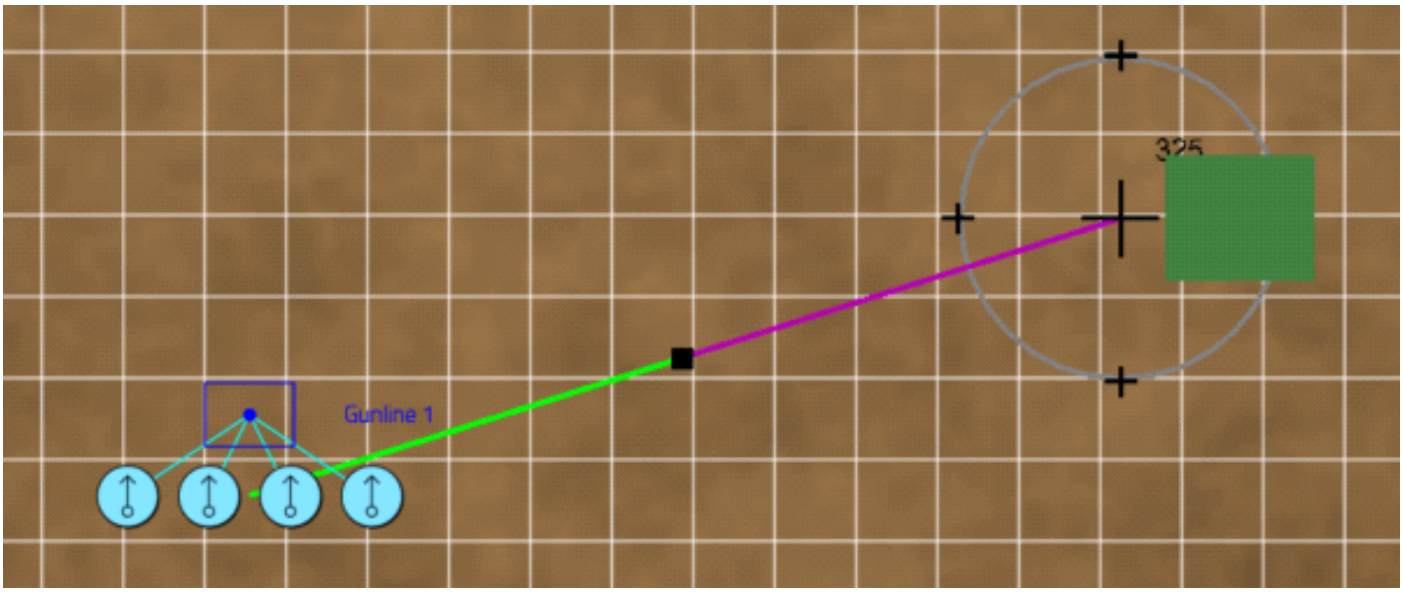
Convergence

All rounds are aimed at the same point. Terrain changes from impacting rounds, and differences in physical fuse simulation may make the exact point of impact differ slightly. There may also be a dispersion factor if the gunline was configured using the **Dispersion** option (see Create Gunlines (on page 23)).



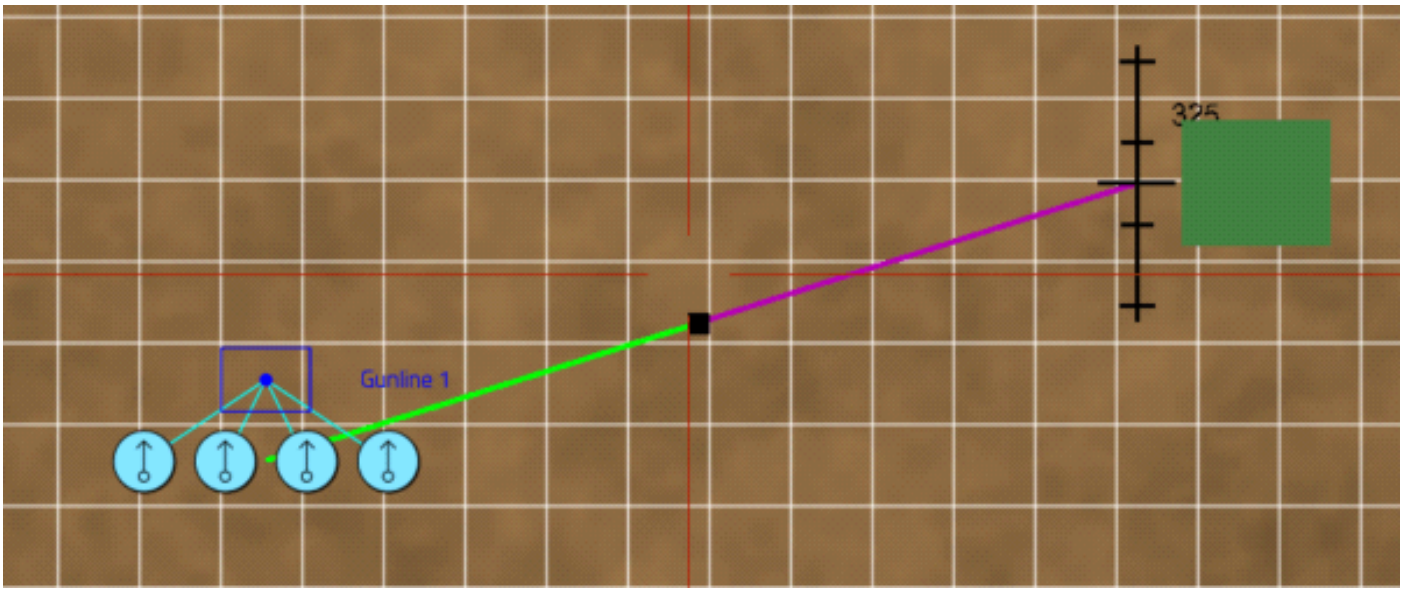
Circle

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



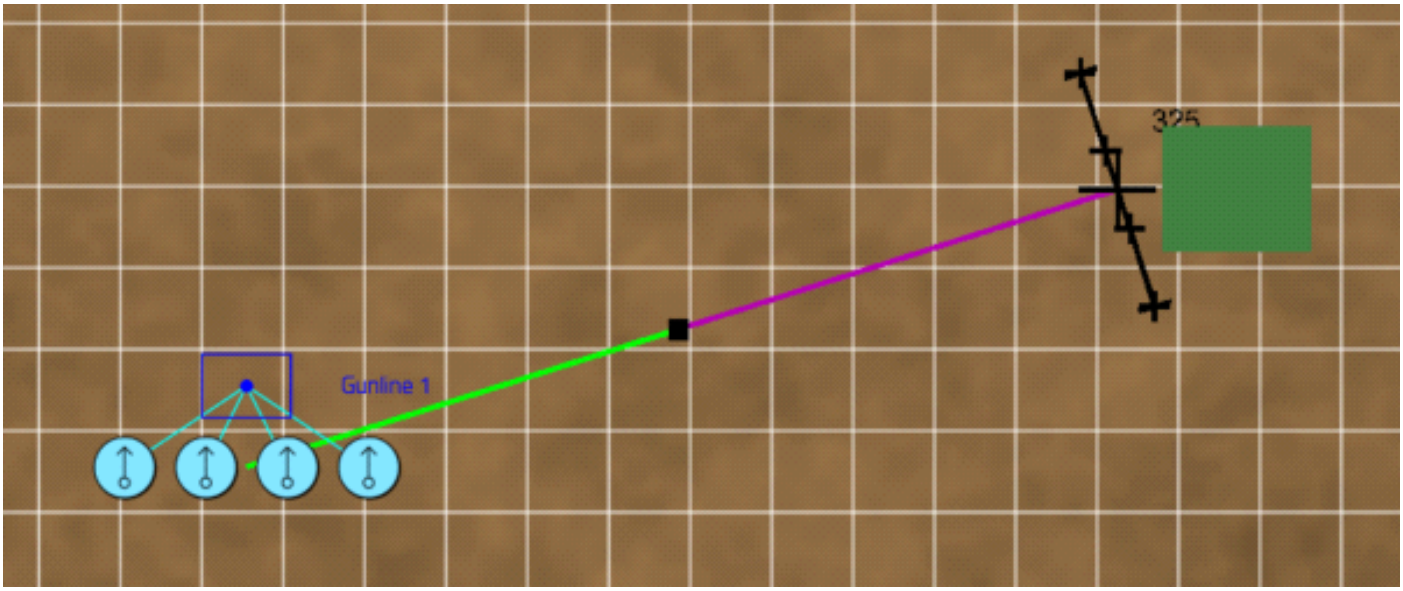
Linear

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



Open

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



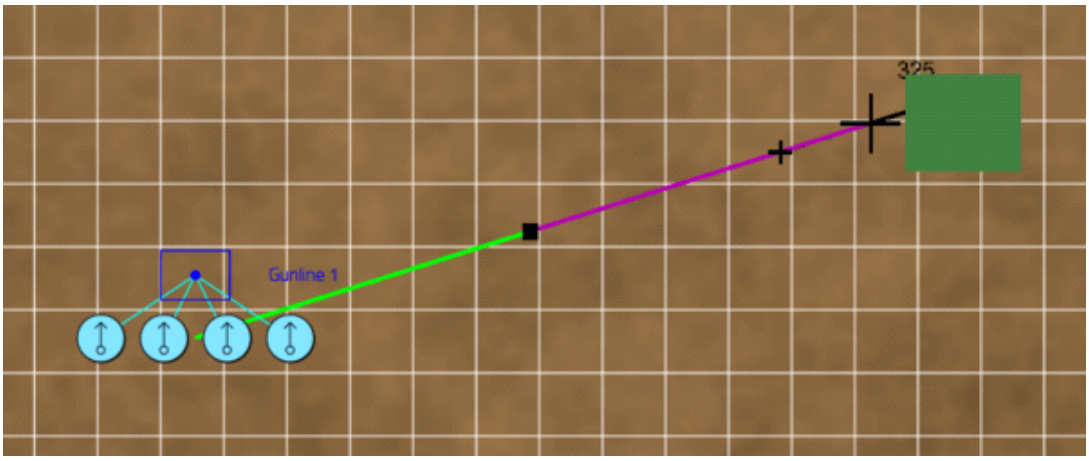
Range

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

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

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

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



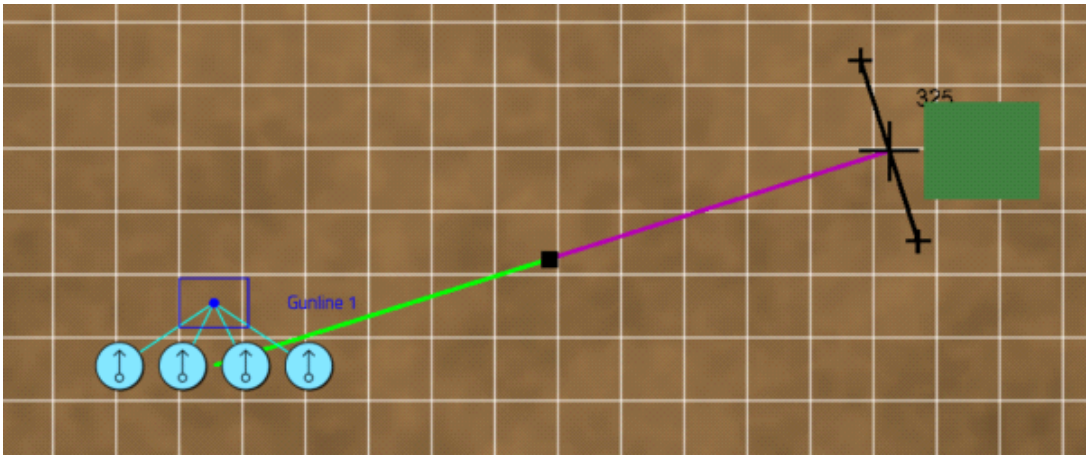
Lateral

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

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

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

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

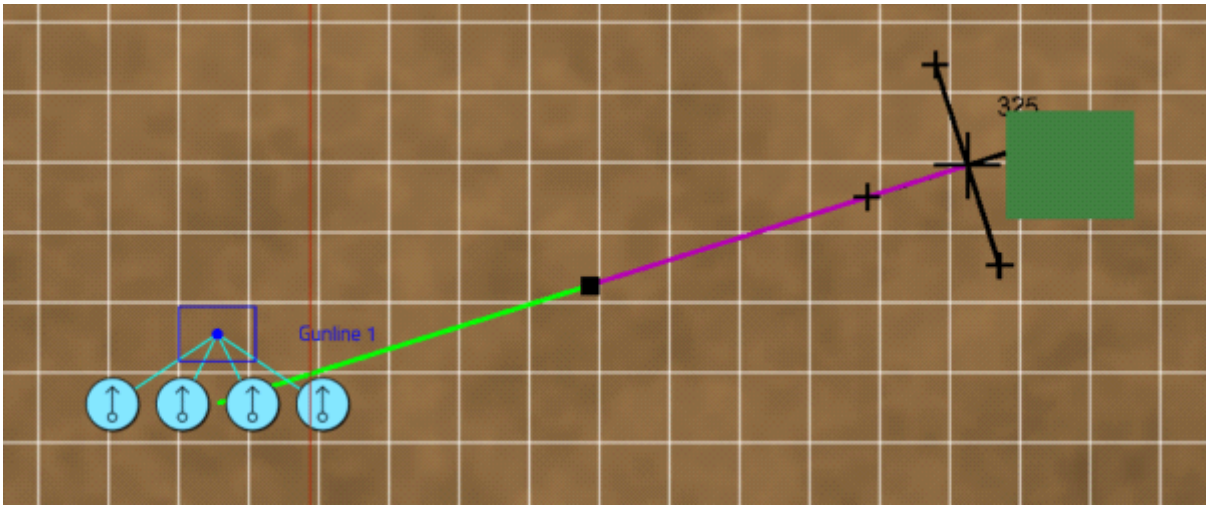


Range Lateral

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

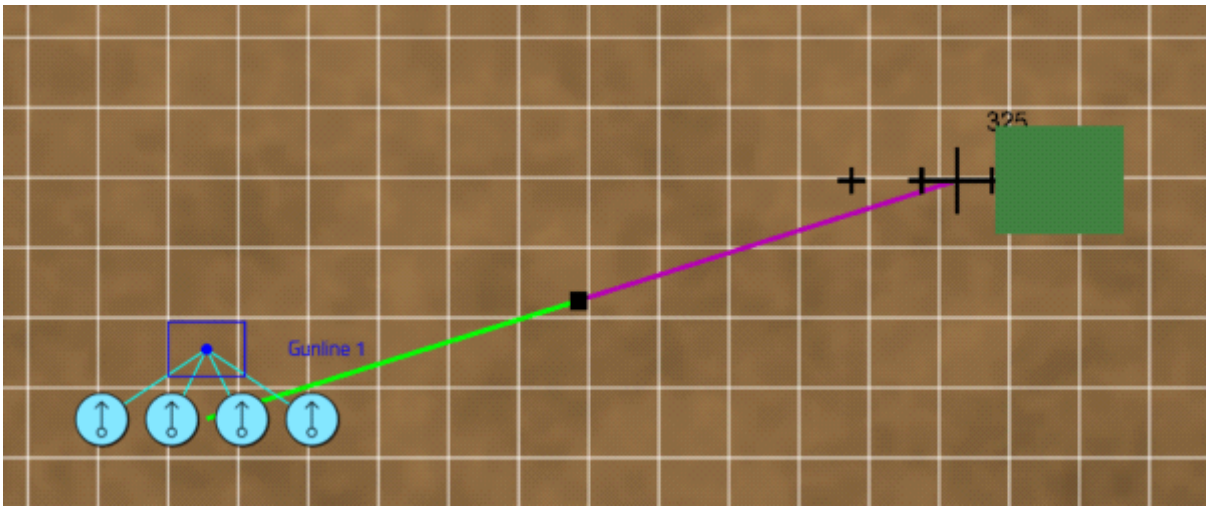
Shots are distributed alternately between the four targets. For example, in the screenshot that follows:

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



Parallel

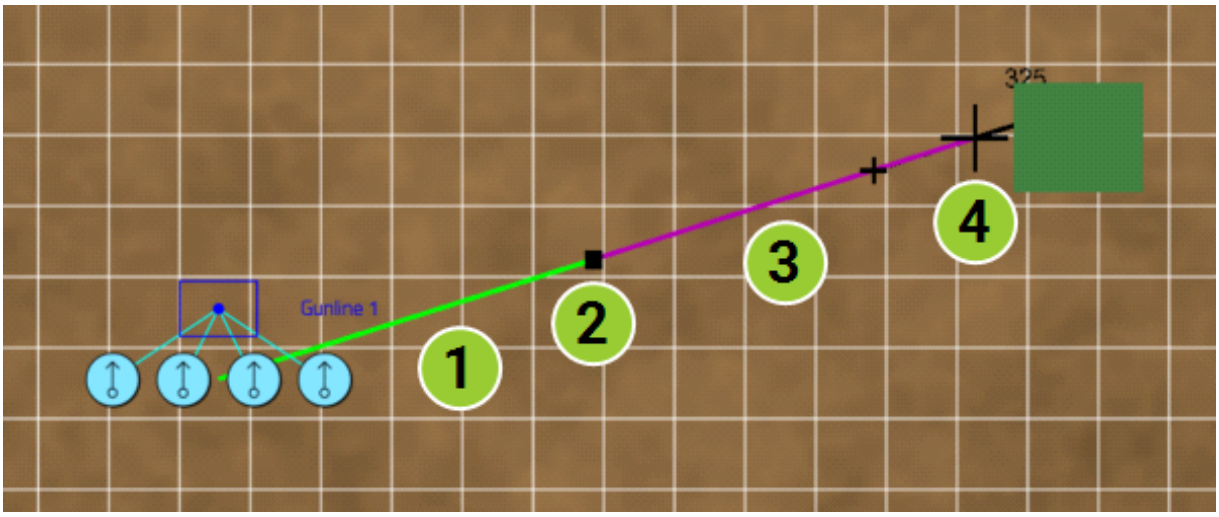
The impact points of the rounds mirror the physical layout of the guns on the ground.



5.6 Fire Mission Verification

When you click **Process** in the Fire Mission panel, a verification panel opens which enables you to check all your settings before starting the fire mission. The panel is similar in appearance to the Mission Report Panel (on page 19), and contains similar data. It also displays the Message to Observer (below) (MTO). If processing fails, notification is shown and you can make changes.

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



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

5.6.1 Message to Observer

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

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

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

6. VBS Call for Fire in AAR

As an Administrator / Instructor / Trainee, you are able to review CFF 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, Trainees can also view them on their computers. For more information about accessing AAR recordings and using the AAR UI, see After Action Review (AAR) in the VBS4 AAR Manual.

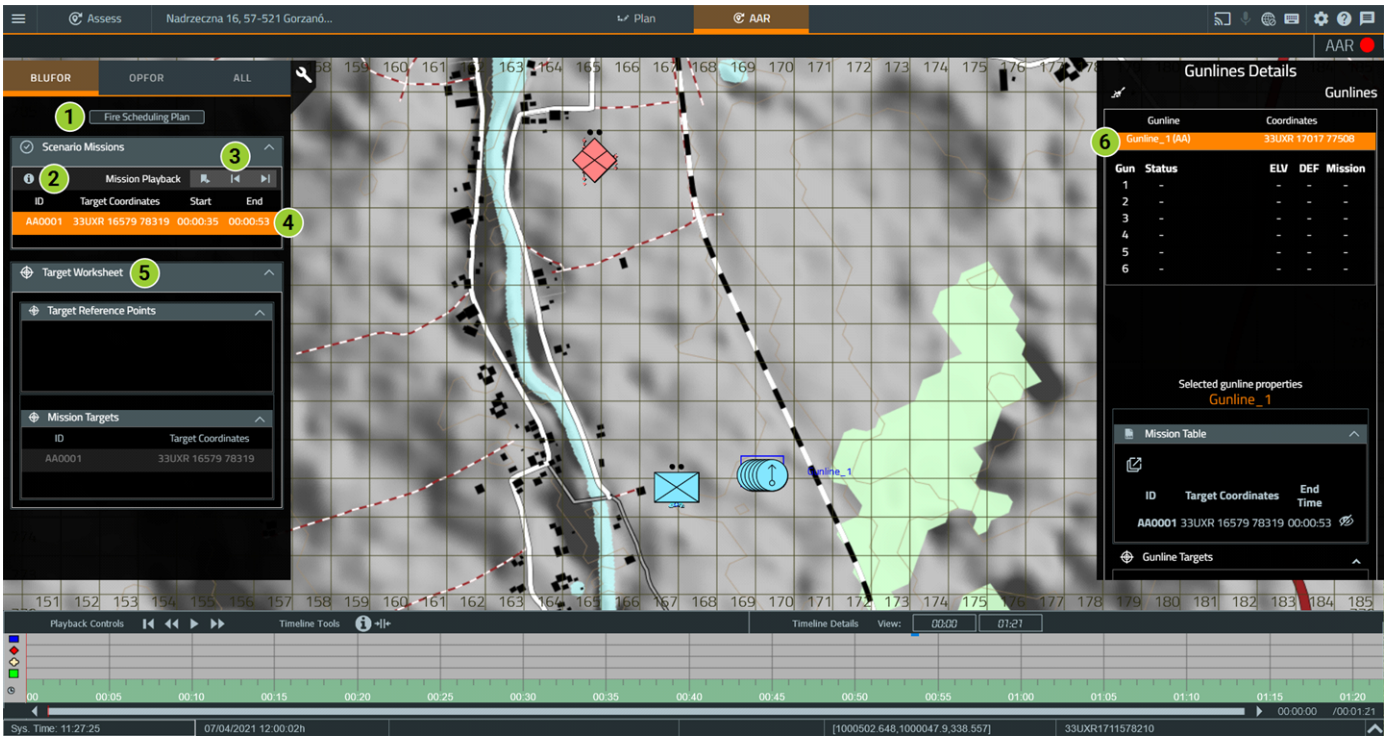
6.1 AAR FDC UI

With the AAR screen open, click the **FDC** tab to open the AAR version of the VBS Call for Fire - FDC UI (on page 13).

The UI opens with the following panels on either side of your screen:

- Main FDC panel.
- Gunlines Details panel.

Image-6: FDC AAR UI



The UI has the following features:

No.	Description
1	Click to see a list of missions that were scheduled during the scenario, but not fired.

No.	Description
2	Information button. Click to open the Mission Report Panel (on page 19) to view data about the mission. 
3	Button controls:  Bookmark  Previous volley  Next volley
4	Mission Playback List (below)
5	Target Worksheet, see Target Management (on page 31).
6	Gunline entry, see Gunline Data (on page 41) for more information.

6.2 Mission Playback List

This list contains all of the fire missions that are present in the recorded scenario. From here you can replay specific fire missions, so that Trainees can see how they performed.

Follow these steps:

1. Select a **fire mission** entry in the Mission Playback list, so that it is highlighted.
2. Click the **Bookmark** button to jump to the start of the fire mission.
3. Optional. Before starting fire mission playback, do the following to see these features:
   - **Volleys**
     a. Click the **information** icon.
     b. Scroll down to the Volley section, and click the **eye** icon for the volley you want to view
     c. Click **Close Report**.
   - **Gunline procedures in real-time**

     Expand the gunline entry (see Gunline Data (on page 41)).
4. Press **Play** in Playback Controls to start the fire mission replay.

The fire mission plays. To repeat the volley, click the **Previous Volley** button. To skip to the next volley in the fire mission, click the **Next Volley** button.

7. VBS Call for Fire UI Configuration

Administrators can configure the Fire Direction Center (FDC) UI in VBS Call for Fire (CFF) to offer any VBS4 gun or ammunition type, in addition to those included by default.

To do this, the `config.json` file must be edited on the computer CFF is administered from, which is found at the following location:

`\VBS_Installation\Components\CallForFire\`

WARNING

Only the gun and ammunition types provided by default in CFF are tested and supported. Other types of guns and ammunition found in VBS4 may be compatible with CFF, but this is not guaranteed.

Editing the `config.json` file is intended for advanced administrative users. Incorrect editing prevents CFF from functioning properly. It is advisable to create a backup before editing the file.

The `config.json` file is divided into the following segments:

- Fuse Types (below)
- Ammo Types (on page 60)
- Gun Types (on page 60)

7.1 Fuse Types

The following table lists the parameters used in the `fuseTypes` segment of the configuration.

Parameter	Description
className	Defines the unique name you want to refer to the fuse configuration by, when defining fuse types supported by ammunition types.
fuseName	Defines the fuse configuration class name, found inside the relevant VBS4 ammunition configuration. Select from: `impact`, `proximity`, `nearSurface`, `delay`, or `timed`.
fuseMode	Defines the VBS4 simulation type. Select from: `pointDetonating`, `proximity`, `nearSurface`, `delay`, `timed`, or `bonus`. **NOTE** The `fuseName` and `fuseMode` should match, with the exception of `impact` / `pointDetonating` and `timed` / `bonus`, which can be used together.

Parameter	Description
burstHeight	Defines the default height of burst, presented in the CFF UI for timed fuses (in meters). **NOTE** For proximity or near-surface fuses, the value cannot be changed by the FDC Operator.
delay	Defines the time-after-impact that the fuse is set to explode, for delay fuses (in seconds).
armingTime	Defines an arming time, before which a round does not detonate (in seconds). Prevents proximity fuses from exploding as soon as they are fired.

EXAMPLE

```
"fuseTypes": [
  {
    "className": "timed_m930",
    "fuseName": "timed",
    "fuseMode": "timed",
    "burstHeight": 500,
    "delay": 0,
    "armingTime": 0
  }
]
```

7.2 Ammo Types

The following table lists the parameters used in the `ammoTypes` segment of the configuration.

Parameter	Description
className	Defines the VBS4 class name of the magazine type you want to use.
fuseTypes	Defines a list of class names (array) of the fuses you want to make available for the ammunition type.
defaultAmmoCount	Defines the number of the ammunition type you wish gunlines to be equipped with, unless changed by the FDC Operator.

EXAMPLE

```
"ammoTypes": [
  {
    "className": "vbs_mag_sh_m_1rnd_60mm_HE_m720",
    "fuseTypes": ["pointDetonating", "nearSurface_m374",
                  "delay_m734", "proximity_m734"],
    "defaultAmmoCount": 100
  }
]
```

NOTE

The minimum and maximum range for the ammunition type is defined in the weapon configuration, using the `minRange` and `maxRange` parameters. For more information, see Weapon Parameters in the VBS Developer Reference.

7.3 Gun Types

The following table lists the parameters used in the `gunTypes` segment of the configuration.

Parameter	Description
className	Defines the VBS4 class name of the gun type you want to use. Only simple, static turrets behave as expected.
turnOutForFiring	Defines if the Gunner needs to be turned out to fire. Boolean value (`1` / `0`).
forceGunnerTurretID	Defines the index of the firing turret.

Parameter	Description
ammoTypes	Defines a list of magazines (array) that you want the gun to support. Must be usable by the gun in VBS4.
gunStatusDelays	Defines the default delays which are used when the gun type is placed (in seconds).

EXAMPLE

```
"gunTypes": [
  {
    "className": "VBS2_US_Army_M224_Static_W",
    "ammoTypes": ["vbs_mag_sh_m_1rnd_60mm_HE_m720",
                  "vbs_mag_sh_m_1rnd_60mm_SMOKE_WP_m722",
                  "vbs_mag_sh_m_1rnd_60mm_ILLUM_m721"],
    "gunStatusDelays": {"preparing": 5, "attention": 5, "laying": 5,
"loading": 3,
                        "unloading": 5, "stowing": 5}
  }
]
```

For more information about weapon configuration for VBS4, see the Configuration Manual in the VBS Developer Reference.