Route Clearance

VBS4 24.1.1

Documentation Legal Notice

This Documentation, including any embedded help systems and electronically distributed materials, (hereinafter referred to as the “Documentation”) is for your informational purposes only and is subject to change or withdrawal by Bohemia Interactive Simulations (BISim) at any time. This Documentation and its contents are proprietary information of BISim, also protected by copyright, and may not be copied, transferred, reproduced, disclosed, modified or duplicated, in whole or in part, without the prior written consent of BISim.

If you are a licensed user of the software product(s) addressed in the Documentation, you may print or otherwise make available a reasonable number of copies of the Documentation for internal use by you and your employees in connection with that software, provided that all BISim copyright notices and legends are affixed to each reproduced copy.

The right to print or otherwise make available copies of the Documentation is limited to the period during which the applicable license for such software remains in full force and effect. Should the license terminate for any reason, it is your responsibility to certify in writing to BISim that all copies and partial copies of the Documentation have been returned to BISim or destroyed.

BISim has made every reasonable effort to ensure the accuracy of all the information contained in the Documentation. However, product specifications are subject to change without notice, and BISim makes no representations or warranties regarding the accuracy, completeness, or suitability of information contained in the Documentation. To the maximum extent permitted by law, BISim disclaims any and all liability for any loss, damage (direct or indirect) or other consequence which may arise from the use of or reliance upon any information contained in the Documentation.

The use of any software product referenced in the Documentation is governed by the applicable license agreement and such license agreement is not modified in any way by the terms of this notice.

Customer Support

The Bohemia Interactive Simulations Support page can be found at:

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

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

- support@bisimulations.com

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

- http://www.bisimulations.com/

The BISim Wiki is the primary resource on VBS4 scripting:

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

PhysX

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

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

Contents

1. Route Clearance

The purpose of Route Clearance is to secure an important route and render it safe for transport. VBS4 supports Route Clearance for land mines and IEDs.

For a walkthrough example of a simple Route Clearance scenario, see:

- Husky T-MDV Route Clearance Example (below)

A typical Route Clearance group consists of the following:

- A sapper platoon.
- An EOD (Explosive Ordnance Disposal) team.
- At least one medic.
- A wrecker vehicle team.

The general workflow of a Route Clearance simulation in VBS4 contains two parts:

- Route Clearance Preparation (on page 17)
- Route Clearance Execution (on page 20)

1.1 Husky T-MDV Route Clearance Example

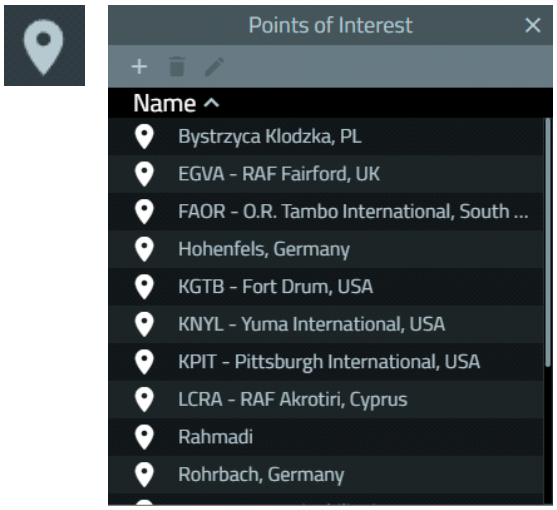
You can create a Route Clearance Scenario, using a Husky T-MDV vehicle. The Route Clearance Scenario clears hazards along the same route used in the Control AI Convoy Example Scenario.

Follow these steps:

1. In the VBS4 Toolbar of the Battlespaces Mode, select the **Battlespaces** tab.

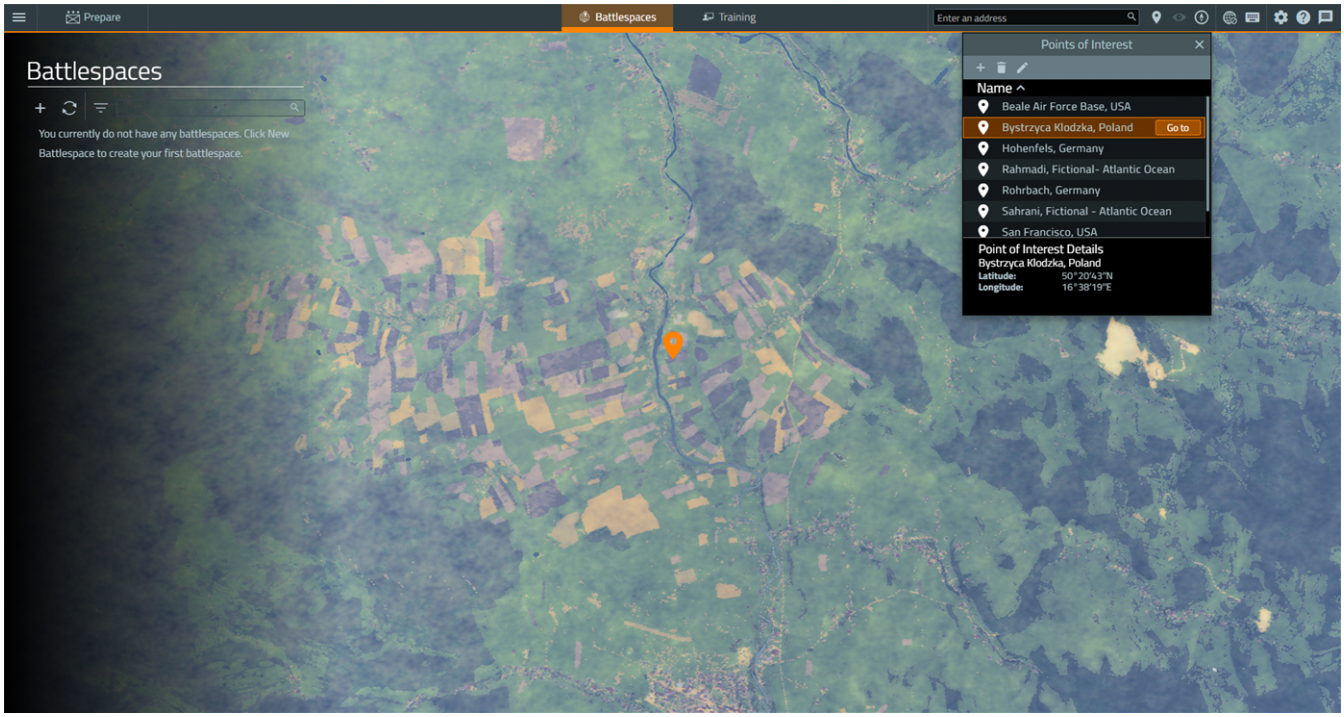
   > **NOTE**
   > When starting the VBS4 Admin Client, the Battlespaces tab is selected by default.

2. Click the **POI Icon** to open the POI Panel.



3. In the Points of Interest Panel, select **Bystrzyca Klodzka, PL**, and click **Go to**.

   The Whole-Earth Terrain rotates directly above the Bystrzyca Klodzka terrain, in Poland.

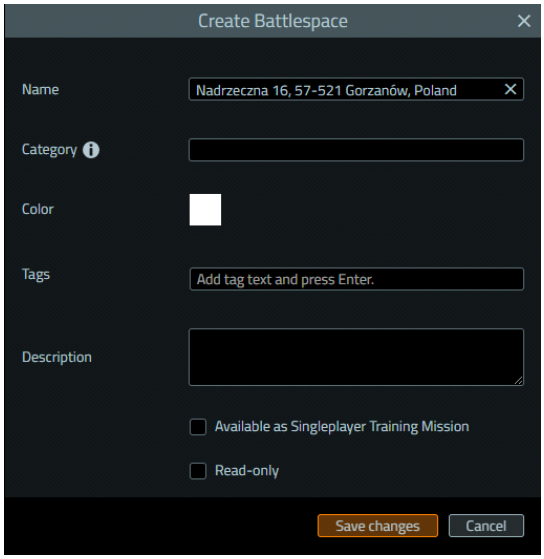


4. In the Search Bar of the VBS4 Toolbar, input the coordinates **50°20'46"N, 16°38'08"E**, and then press **Enter**.

   Use the **Mouse Scroll Wheel** to zoom in to view the area displayed in the following image:

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

   The Create Battlespace Dialog opens, displaying the selected coordinates.



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

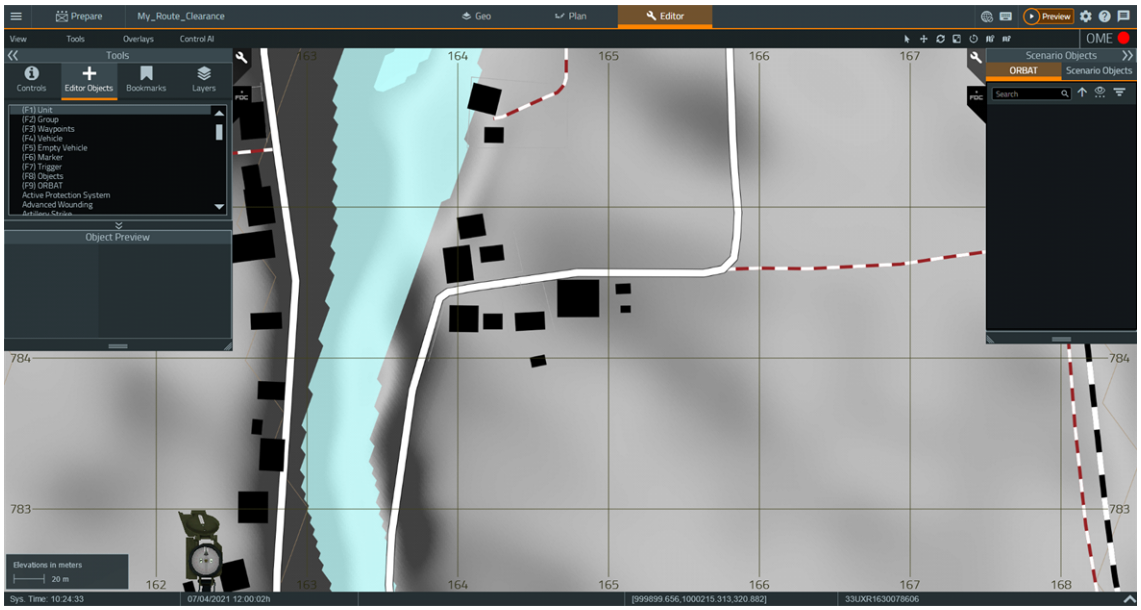
Parameter	Value
Name	My_Route_Clearance
Color	**Green** #36b82c
Tags	MyUseCase
Description	Route Clearance Use Case

7. Click **Save Changes**.

   VBS4 adds the Battlespace to the Battlespaces List, and a **green** icon to the Whole-Earth Terrain.

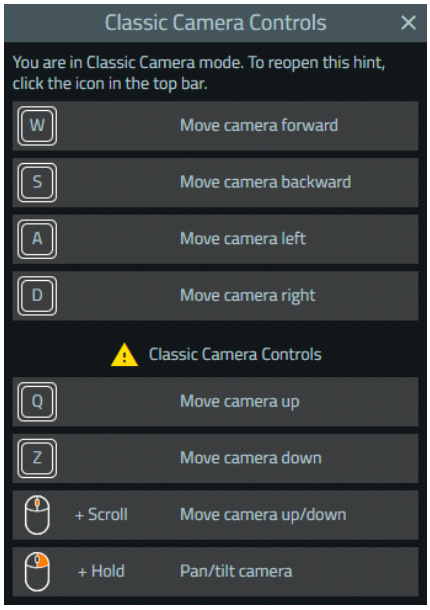
8. Select the newly created **My_Route_Clearance** Battlespace, and under **Prepare > Editor**, click **Create**.

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



> **TIP**
>
> If required, toggle terrain textures in the 2D View, select **View > Hide / Show Texture**.

Use the Classic Camera Controls to move the camera:



9. In the Tools Panel, select **(F4) Vehicle**, and double-click a location on the white road where you want the Husky T-MDV vehicle placed.

10. In the Object Properties dialog, select the **US Army Wheeled - Woodland > Husky - T-MDV, IA** vehicle, and click **OK**.

    WARNING

    Make sure the **Player** is selected in **Has Crew? / Special**, so that the vehicle is playable:

    The Husky T-MDV vehicle is placed.

11. Hold **LShift + RMB** and move the mouse left / right to rotate the vehicle, so that it aligns with the road, facing north. Press **Map** (**M**) to switch between 2D / 3D View.

    The vehicle is positioned as indicated in the following image:

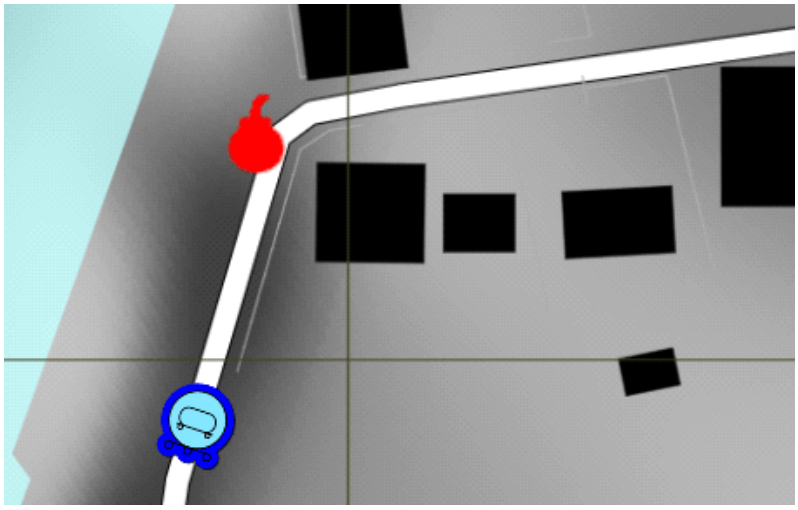
12. In the Tools Panel, select **IED**, and double-click a location on the map next to the road where it turns right.

    The IED Object Properties dialog opens.

13. In the Object Properties dialog, set the following properties:

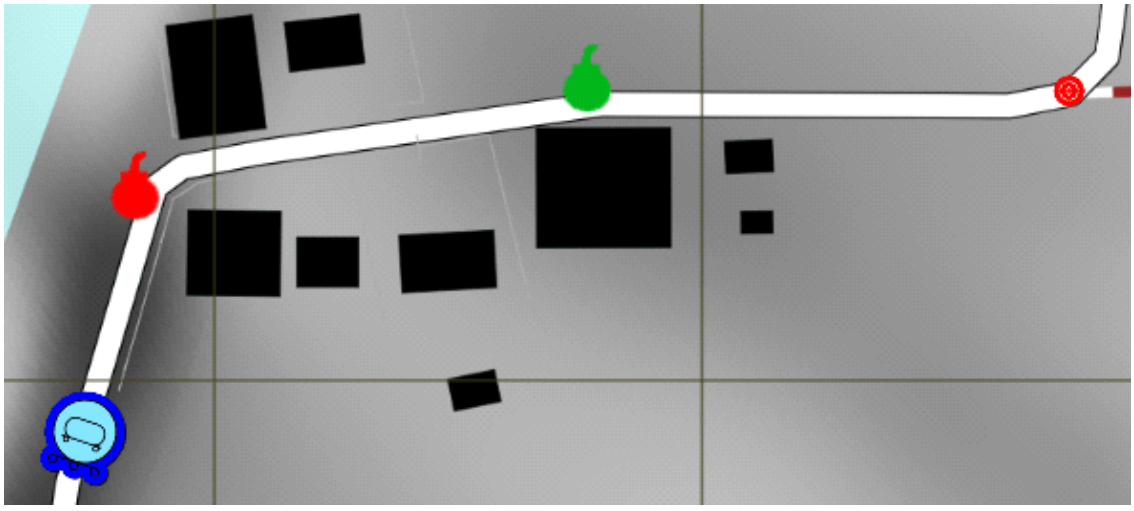
    - **Type:** Bag 01
    - **Explosion Size:** Small
    - **Explosion Type:** Deadly
    - **Trigger Type:** Admin and Bomb Carrier

14. Click **OK** to place the IED.



15. Place another IED, east of the first IED, next to the road, and set the following properties:
    - **Type:** Bag 02
    - **Explosion Size:** Small
    - **Explosion Type:** Fake (No Damage)
    - **Trigger Type:** Admin and Bomb Carrier
16. Click **OK** to place the IED.
17. In the Tools Panel, select **Mine**, and double-click a location on the road, where it turns north.

    The Mine Object Properties dialog opens.
18. In the Object Properties dialog, set the following properties:
    - **Type:** AT2 Anti-Tank Mine (Hidden)
19. Click **OK** to place the mine.



20. Expand the **Main Menu**, and under **Battlespaces**, select **Save**.

21. Click **Preview** to preview the Scenario.

    The Scenario starts with you in position of the Husky T-MDV driver and operator.

22. Press **Quick Menu** (**Left Windows**) (see Quick Menu Actions in the VBS4 Trainee Manual), and select **VEHICLE > ACTIVATE MINE DETECTOR**.

    The Husky T-MDV mine detector is activated, and the detector flaps are lowered on each side of the vehicle.

23. Press **Quick Menu** (**Left Windows**), and select **VEHICLE > OPERATE IA**.

    The Interrogator Arm (IA) operation menu opens at the bottom of the screen.

24. Drive to the first IED, using the following vehicle controls:

    The following table lists the Land Vehicle Controls, defaults, and option names from the **Vehicle Controls** and **Infantry Controls** category filters in the Controls Settings in the VBS4 Administrator Manual:

Default Control	Description	Control Option Name
W	Forward	Car Forward
	NOTE **W** does not reach the maximum speed. Use **Car Fast Forward**.	
S	Brake / Reverse	Car Back
A / Mouse Left	Turn Left	Car Left / Car More Left
D / Mouse Right	Turn Right	Car Right / Car More Right
Q	Slow Forward	Car Slow Forward
E / LShift + W	Fast Forward	Car Fast Forward / Vehicle Turbo + Car Forward
LMB	Horn	Fire

NOTE

For Microsoft Xbox land vehicle controls, see Microsoft Xbox Controls in the VBS4 Trainee Manual.

For Logitech 3D Extreme controls, see Controls Settings in the VBS4 Administrator Manual.

25. Operate the IA to pick up the first IED, using the following IA controls:

IA Action	Control	IA Action	Control
Rotate arm left	User Defined 1	Secondary boom up	User Defined 7
Rotate arm right	User Defined 2	Secondary boom down	User Defined 8
Main boom up	User Defined 3	Claw open	User Defined 9
Main boom down	User Defined 4	Claw close	User Defined 10
Extend boom	User Defined 5	Stow IA	User Defined 11
Retract boom	User Defined 6	Drop objects	User Defined 12
		Disarm IEDs	User Defined 13

26. Use the IA camera to assist you in operating the IA.

    The IA variant of the Husky T-MDV has three ways of viewing the IA camera:

    - On-screen in the upper-right corner.
    - On the screen in the Husky cabin.
    - Full-screen.

Image-1: IED on screen, ready to be picked up

Image-2: Picked-up IED, ready to disarm

The IA picks up the IED automatically, once IA claw is adjusted and is close enough to the IED.

27. Press **Quick Menu** (**Left Windows**), and select **VEHICLE > DISARM IEDS**.

    The message **Bomb disarmed** appears on screen.

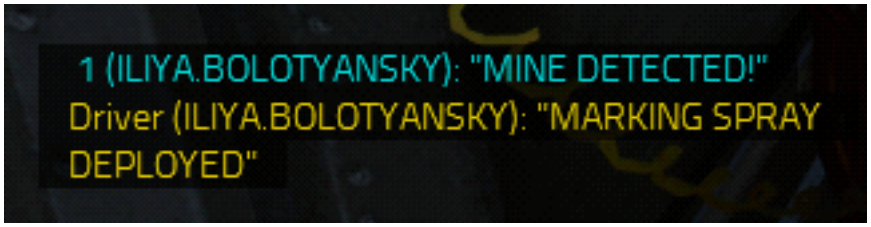
28. Press **Quick Menu** (**Left Windows**), and select **VEHICLE > DROP OBJECTS**.

    The IA releases the disarmed IED.

29. Repeat steps 21 - 24 for the second IED.

> **TIP**
>
> When you finished, stow the IA by selecting **VEHICLE > STOW IA** in the Quick Menu.

30. Drive up the road over the hidden mine, until you see the following messages: **MINE DETECTED** and **MARKING SPRAY DEPLOYED** at the bottom of the screen.



    The Husky T-MDV automatically marks the detected mine location with spray.

NOTE

The Route Clearance Scenario is also available as a sample Battlespace on VBS World Server or in:

`\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

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

Follow these steps:

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

  Copy Battlespace

  1. Open the following folder in Windows File Explorer:

     `\VBS_Installation\optional\Demo_Scenarios\Battlespaces\`

  2. Copy the `UseCase_Name` folders to your local Battlespaces Folder (see the Introduction to VBS4 Guide) at:

     `\Documents\VBS4\Battlespaces\`

Use the Battlespaces List to Filter Battlespaces (see the Introduction to VBS4 Guide) using **UseCase** as the filter.

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

1.2 Route Clearance Preparation

As an administrator, use VBS Editor in Prepare mode to prepare Route Clearance mission.

Follow these steps:

1. Use VBS Editor to create a new Scenario, or edit an existing one.

   For more information, see Scenario Preparation in the VBS4 Editor Manual.

2. Add any of the following hazards to the Route Clearance scenario:

Hazard	Description
Mines	Place mines in your scenario. For more information, see Placing Mines (on page 23).
IEDs	Place IEDs in the scenario. For more information, see Placing Improvised Explosive Devices (on page 27). In addition, you can use other visual indicators, to designate IEDs, such as the following: • **Objects > Objects - IED** • **Objects > Objects - Outdoor** • **Objects > Scenery - Misc** For information on using IEDs in an ambush, see the IED Ambush use case.

3. VBS4 has units with specific functionality for Route Clearance, including the following:

Unit	Description
EOD Bombsuit Technician	An EOD technician wears a special bombsuit and can disarm IEDs: • **US USMC Desert / Woodland > EOD - Bombsuit Technician** **NOTE** Cannot disarm mines, but can be equipped with a Mine Marker Kit to detect and mark mines. For more information, see Mine Marker Kit (on page 85).
Bomb Detection Dog	A specially trained bomb detection dog can be used to locate IEDs: • **Animals > German Shepherd - Bomb Detection Dog (MWD)** (see Bomb Detection Dog (MWD) (on page 82)) **NOTE** Cannot detect mines.
Medics	A set of medical personnel available to treat injuries incurred as a result of trying to defeat the hazards. Each medic model name is prefixed with **Medic**.

Add personnel to the scenario.

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

4. VBS4 has vehicles with specific functionality for Route Clearance, including the following:

Vehicle	Description
IED and Mine Clearance	Engineering vehicles can be used for defeating hazards: • **Buffalo** (only defeats IEDs) • **Husky - T-MDV, IA** (only defeats IEDs) • **Vehicles with mine rollers** (defeat both mines and IEDs): ◦ **AU Army Wheeled - Desert / Woodland > Bushmaster - Troop Carrier, Mag 58, SMR2** ◦ **US Army Wheeled - Woodland > M1132 Stryker ESV - M2 - Rollers** ◦ **US Army Wheeled - Woodland > M1132 Stryker ESV - Mk19 - Rollers** • **MICLIC Vehicles** (defeat both mines and IEDs): ◦ **M1150 Assault Breacher Vehicle** ◦ **M60 - AVLM**
Unmanned Vehicles	UGVs, such as the Talon EOD, can be used to defeat hazards: • **Unmanned Vehicles > Talon EOD** (defeats both mines and IEDs)
Towing Vehicles	Towing vehicles team. For example, a wrecker-vehicle team tows damaged equipment and other vehicles: • **MC3 - Wrecker** and **M1089 Wrecker** Another example is towing with a winch, for which the following vehicle model is available: • **M88A2 - ARV** Other vehicles can tow by Enabling Automatic Towing (on page 39) in the mission.

Add vehicles to the scenario.

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

5. Add additional objects and equipment.

   VBS4 includes a specific set of Editor Objects and equipment for Route Clearance scenarios:

Additional Object / Equipment	Description
CREW Link	Counter RCIED (Radio-Controlled Improvised Explosive Device) Electronic Warfare (CREW) can be used to jam IED signals, to disable detonation. For more information, see Enabling CREW (on page 44).
Mine Marker Kits	Place Mine Marker Kits (**Objects > Mine Marker Kit**) in your scenario to mark mines. **NOTE** Mine Marker Kits are usually used by specialized personnel, such as EOD bombsuit technicians, but any other type of unit can use them too. For information on how to use the Mine Marker Kit, see Mine Marker Kit (on page 85).

6. Add additional BLUFOR units and vehicles that are protected by the Route Clearance group.

   For example, a Route Clearance group often accompanies a convoy. For more information on convoys, see the Convoys use case.

7. Preview and save the mission.

   For more information, see Scenario Preparation in the VBS4 Editor Manual.

1.3 Route Clearance Execution

Once the Route Clearance scenario is prepared by the administrator, it can be executed.

Start the Scenario and open VBS Editor.

For more information, see Scenario Execution in the VBS4 Instructor Manual.

Use the Editor UI to modify the scenario as it runs.

A typical Route Clearance scenario has the following phases:

Hazard Detection

Players perform hazard detection along the route.

VBS4 supports the following hazard detection functionality:

Detection Simulation	Description
Husky T-MDV	The Husky T-MDV vehicle has the following detection mechanisms: • Metal Detector (MD) (on page 55) • Ground Penetrating Radar (GPR) (on page 56)
Buffalo	The Buffalo vehicle has an arm camera to detect hazards. For more information, see Buffalo (on page 52).
UGV	A UGV, such as the Talon EOD, can be deployed to investigate the scene. For more information, see Using UGVs and Static Sensors (on page 71).
Bomb Detection Dog	A Bomb Detection Dog (see Bomb Detection Dog (MWD) (on page 82)) can be sent to spot hazards.
Binoculars	Infantry units and vehicle crew can use binoculars. For more information, see the use of binoculars in Standard Equipment (infantry units) and Personal Equipment Controls (vehicle crew) in the VBS4 Trainee Manual.

Defeat Hazards

If hazards are detected, an EOD team moves in to defeat the hazards.

> **NOTE**
>
> As an administrator, you can detonate IEDs manually. For more information, see Detonating an IED (on page 36).

VBS4 supports the following hazard-defeat functionality:

Defeat Simulation	Description
Husky T-MDV	The Husky T-MDV vehicle has the following hazard-defeat mechanisms: • Interrogator Arm (IA) (on page 57). • Mine Detonation Trailer (MDT). For more information, see Trailers (on page 61). • Force Protection Electronic Counter-Measures (FPECM) (on page 61).
Buffalo	The Buffalo vehicle (see Buffalo (on page 52)) can use its arm to pick an IED and move it to a safe location, where it can be destroyed.
Mine Clearing Roller Vehicle	Any of the supported Mine Clearing Roller vehicles (see Mine Clearing Rollers (on page 62)) can roll over mines and detonate them.
MICLIC Vehicle	Any of the supported MICLIC vehicles (see MICLIC (on page 64)) can use the MICLIC launcher to detonate hazards.

Defeat Simulation	Description
CREW Device	A CREW device can be used to disable certain IEDs from being triggered. For more information, see Using CREW (on page 68).
UGV	A UGV, such as the Talon EOD can be used to remove and destroy IEDs. For more information, see Using UGVs and Static Sensors (on page 71).
EOD Bombsuit Technician	The **US USMC Desert / Woodland > EOD - Bombsuit Technician** unit can use 3D World Actions (see the VBS4 Trainee Manual) to disarm IEDs and mark mines. For more information, see Improvised Explosive Devices (on page 84) and Mine Marker Kit (on page 85).

If damage is sustained in the process of defeating the hazards, any of the following functionality is available:

- Damaged equipment and / or vehicles can be towed away.

  For more information, see Towing Vehicles (on page 75).

- Wounded units can request medical assistance from medics.

2. Placing Mines

VBS4 includes a variety of land and sea mines for use in missions.

WARNING

Adding / deleting this Editor Object in the VBS Editor during a multiplayer scenario may not be reflected on other clients.

You can do the following with mines:

- Create a Mine (below)
- Create a Minefield (on page 25)

NOTE

Mines that you want Trainees to place themselves during a scenario should be added to the Equipment Inventory (see Equipment Inventory in the VBS4 Trainee Manual) of units, see Edit Equipment Loadout in the VBS4 Editor Manual. How Trainees then place them is discussed in Placing Mines Simulation in the VBS4 Trainee Manual.

2.1 Create a Mine

In the **Editor Objects List**, select **Mine** and click the map, where you want to place the Mine Editor Object.

Image-3: Mine Editor Object Properties

In the Object Properties dialog, set the following options:

For land mines:

Option	Description
Presence Condition	The condition for the mine to be present. **NOTE** Only available in Prepare mode.

Option	Description
Type	Drop-down list of possible mines to place. Land mines (anti-tank or anti-personnel) can be hidden or observable.
Placement Radius	The distance from the placement point of this Editor Object that the mine could randomly spawn within.

For sea mines:

Option	Description
Presence Condition	The condition for the mine to be present. **NOTE** Only available in Prepare mode.
Type	Sea mines have the following types: • **Sea Mine Bottom** - Snaps to the seabed. • **Sea Mine Floating** - Floats on the surface of the sea. • **Sea Mine Tethered** - Held in place by a tether stretching down to the sea-bed. Once the height in the water is set by the user (with the transform tool) the mine remains in this position until it is deleted or triggered. Each sea-mine type has the following fuse types: • **Contact** - Contact fuses work when a collision occurs between an object and the mine. The object must meet the trigger mass of the mine, which is set in the model configuration of the mine (see the Configuration Manual in the VBS Developer Reference). Currently all supported large vessels (Ferry+) trigger the mine. **NOTE** The Developer Reference is in the `\docs\` folder of the VBS Developer Suite installation. • **Magnetic** - When a vessel of the specified mass (see **Contact**), and with magnetic mine detonation enabled, enters the model-configuration assigned trigger radius of this mine, the mine detonates. • **Seismic** - The seismic mine is triggered much in the same way as the magnetic mine above. However, this mine does NOT check for magnetism, and detonates purely on vessel mass and proximity.

Option	Description
Placement Radius	Sea-mine types have the following placement considerations: • **Sea Mine Bottom** - Cannot be raised above sea-bed. • **Sea Mine Floating** - Can be raised above sea-level but falls back down. Can be placed below sea-level but floats up. • **Sea Mine Tethered** - Cannot be placed above sea-level. If placed below the surface, it remains in position (does not float to surface).

Click **OK** to confirm.

The Mine Editor Object is placed on the map.

Image-4: A visible M15 Anti-Tank mine and a floating sea mine

2.2 Create a Minefield

You can create a minefield, using the Script Editor Object.

Follow these steps:

1. Add a trigger (see Triggers in the VBS4 Editor Manual) to the map.

   WARNING

   The trigger must be of a certain size to define the minefield area. Also, the trigger area can only be rectangular. Circular areas are converted to rectangular ones.

2. In the Editor Objects List, select **Script** and place the Script Editor Object on the map.
3. In the **Filter** drop-down, select **Special Scripts**.
4. In the **Script File** drop-down, select **Minefield**.
5. In the **Type** drop-down, select the type of mine to use.
6. In the **Warning Signs** drop-down, select one of the following:
   - **Don't Show Signs** - Does not show any warning signs about the minefield, to indicate it.
   - **Show Signs** - Shows warning signs about the minefield, to indicate it.

7. In the **Density** drop-down, select the mine density of: **Normal**, **Low**, or **Very Low**.
8. In **Grid Spacing**, specify the spacing (in meters) between the mines, as they are arranged into a grid.
9. In the **Execute Globally?** drop-down, select whether the script should run locally or globally in a multiplayer scenario:
    - **Execute Only on Client Where Condition is True** - Runs the script only on clients, where the **Condition** setting (see step 9) is true.
    - **Execute on Every Client, Even if Condition is False on Some** - Runs the script on all the clients.
10. In **Condition**, specify the Boolean condition for the minefield to be created.
11. In the **Repeatedly** drop-down, set whether the condition should be evaluated repeatedly or not:
    - **Do Not Repeat** - Evaluate the condition only once.
    - **Repeat When Condition is True Again** - Evaluate the condition every time it returns true.
12. Right-click the Script Editor Object, select **Link to Trigger (Creates Minefield)**, drag the arrow and click the trigger you created in step 1, to link.

When the scenario runs, the Script Editor Object creates a minefield, according to the set condition.

For more information, see the Script Editor Object in the VBS4 Editor Manual.

For a demonstration of some Mine Clearance functionality in action, see the VBS4 Instructor Series - Mine Clearance Demonstration video at https://youtu.be/f2bXHSdA2cE.

NOTE

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

3. Placing Improvised Explosive Devices

VBS4 includes Improvised Explosive Devices (IEDs) to enable the simulation of explode-on-demand roadside bombs, suicide bombers, and vehicle-borne IEDs.

Image-5: IED Object Properties

Follow these steps:

1. In the **Editor Objects List**, select **IED** and click the map, where you want to place the IED Editor Object.
2. Set the IED Options (on page 29).
3. Set the IED Trigger Type (on page 30).
4. Click **OK** to confirm.

   The IED Editor Object is placed on the map.

5. **Optional:** To rotate the IED in the 2D or 3D View, hold **Shift + RMB** and release to confirm.

   Pressure Plate Rotation

   If you are using an IED with a Pressure Plate (see IED Trigger Type (on page 30)), it is possible to rotate the Pressure Plate area separately from the IED itself:

   a. In the 2D or 3D View, click the **Pressure Plate** to select it.

   b. To rotate the Pressure Plate, hold **Shift + RMB** and release to confirm.

   Image-6: IED and Pressure Plate in the 2D and 3D Views (left to right)

In addition, see the following IED-related functionality:

- Equipment Inventory (on page 34)
- Attaching IEDs to Units and Vehicles (on page 34)
- Attaching IEDs to Triggers (on page 35)
- Detonating an IED (on page 36)
- Knock-Out Effect (on page 37)
- On Explode Code (on page 38)

3.1 IED Options

The IED Editor Object has the following options that can be set:

> **NOTE**
>
> To obtain the IED functionality as described in the following table, use the IED Editor Object. Placing individual IED objects in the mission using the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual), for example, does not provide the same functionality.

IED Option	Description
Name	Variable name of the IED. Only relevant if you intend to reference the IED in script code.
Type	Defines the 3D model that is used to visualize the IED in VBS4.
Explosion Size	Size of the explosion that the IED generates.
Explosion Type	Sets the type of explosion. The options are: • **Deadly** - Kills units that are close to the explosion. • **Wound Only** - Does not kill units. Useful for EVAC type missions. • **Fake (No Damage)** - The IED does not do any damage. See Knock-Out Effect (on page 37) for information on how different explosion types affect characters.
Disarm Duration	Time (in seconds) it takes to disarm an IED, using the **DISARM IED** option in the Quick Menu for vehicles, or the **Disarm Bomb** 3D World Action for units. **NOTE** Can only be set in Prepare Mode. For more information, see User Actions in the VBS4 Trainee Manual.
Manipulated By	Administrator can specify which side can pick up and plant the IED. **NOTE** Can only be set in Prepare Mode. All other sides only get the **DISARM IED** / **Disarm Bomb** option in the Quick Menu / 3D World Action.

IED Option	Description
Booby Trapped?	IED explodes on pickup unless disarmed first. An unarmed IED placed in VBS Editor does not offer this option. Player placed IEDs can use user actions to add and remove a booby trap. Administrators can toggle a booby trap using the right-click context menu in Execute Mode. **NOTE** If an IED is attached to a unit with the **Booby Trapped?** setting set to true, then it explodes instantly if done so in the Execute Mode, and if done in the Prepare Mode, then it explodes instantly upon mission start. This happens with any IED Type (on the previous page) and any Trigger Type (below).
Trigger Type	Enables you to set what triggers the IED, see IED Trigger Type (below). **NOTE** Can only be set in Prepare Mode.
Radio Range	This field appears when **Radio** trigger types are selected, see IED Trigger Type (below).
Prox. Distance / Side	These fields appear when **Proximity** trigger types are selected, see IED Trigger Type (below).
Can Be Jammed?	This field appears when **Radio**, **Cell Phone**, and **Proximity** trigger types are selected, see IED Trigger Type (below). If set to **true**, these IED trigger types can be jammed by a CREW device (see Enabling CREW in the VBS4 Editor Manual) to prevent detonation. **NOTE** If the IED is carried by a suicide bomber or is attached to a vehicle (VBIED), it cannot be jammed.
On Explode Code	Script to run when the IED explodes (see On Explode Code (on page 38) for further details).

3.2 IED Trigger Type

Use the **Trigger Type** drop-down to select how to trigger the IED:

Admin and Bomb Carrier

Only an administrator or the bomb carrier can set off the IED. Can be moved by players if the **Manipulated By** field allows the side of the player to do so. Players can also shoot the IED or disarm it.

Admin Only

Only an administrator can detonate the IED. Can be moved by players if the **Manipulated By** field allows the side of the player to do so. Players can also shoot the IED or disarm it.

Cell Phone

Similar to the Radio IED except that there is no range setting. The cell phone has an unlimited detonation range.

Passive IR

Detonation of the IED using an infrared tripwire mechanism.

> **NOTE**
>
> If an IED of this **Trigger Type** is attached to a unit (see Attaching IEDs to Units and Vehicles (on page 34)), the IED Editor Object disappears from the Editor Objects List and is instead placed in the unit Equipment Inventory.

Follow these steps:

1. With the IED in your Inventory, select user action **Place Passive IR IED x** (**x** represents the number of the IED if there are multiple IEDs).

   You are now using a wire laying device similar to the Wire Controlled IED, which you can use to move to the placement area of the IR laser device.

2. When you are at your destination, select user action **Place IR Laser x** to place the device (it appears as a wire coil, similar to the Wire Controlled IED. This represents the beginning of the IR tripwire).
3. Move to the position where you want to place the other end of the IR tripwire.
4. Select user action **Place IR Reflector x**.

   The wire coil object disappears and no further objects are visible. The Passive IR is an invisible trigger object.

5. Select user action **Activate IR IED x** to activate the device.

Pressure Plate

Setup a pressure plate to trigger the IED. You can change the size (**Plate Dimension L / W**) and relative position to the IED (**Plate Pos X / Y**). In addition, set the **Activation Weight**, the options are:

- **Every Weight (Even Humans)**
- **Light Vehicles**
- **Heavy Vehicles**

To rotate the Pressure Plate, see Pressure Plate Rotation (on page 28).

> **NOTE**
>
> If an IED of this **Trigger Type** is attached to a unit (see Attaching IEDs to Units and Vehicles (on page 34)), the IED Editor Object disappears from the Editor Objects List and is instead placed in the unit Equipment Inventory.

Proximity

Enables you to define whether or not the IED explodes automatically when a unit of side **Proximity Side** approaches within **Proximity Distance** meters of the device. You can also select whether or not the IED can be jammed, see Can Be Jammed? (on page 30).

> **NOTE**
>
> If an IED of this **Trigger Type** is attached to a unit (see Attaching IEDs to Units and Vehicles (on page 34)), the IED Editor Object disappears from the Editor Objects List and is instead placed in the unit Equipment Inventory.

Radio

Detonation of the IED by radio signal, up to the maximum distance set in the **Radio Range** box.

> **NOTE**
>
> If an IED of this **Trigger Type** is attached to a unit (see Attaching IEDs to Units and Vehicles (on page 34)), the IED Editor Object disappears from the Editor Objects List and is instead placed in the unit Equipment Inventory.

Follow these steps:

1. With the IED in your Inventory, select user action **Place Radio IED x** (**x** represents the number of the IED if there are multiple IEDs).
2. Select user action **Detonate Radio IED x** to detonate the IED.

The IED detonates.

> **NOTE**
>
> You can only detonate IEDs you placed. This action works for vehicles also. If you are outside the range specified in **Radio Range** field, the IED does not detonate.

Wire Controlled

Detonation of the IED using a wire connection.

> **NOTE**
>
> If an IED of this **Trigger Type** is attached to a unit (see Attaching IEDs to Units and Vehicles (on the next page)), the IED Editor Object disappears from the Editor Objects List and is instead placed in the unit Equipment Inventory.

Follow these steps:

1. With the IED in your Inventory, select user action **Place Wire Controlled IED x** (**x** represents the number of the IED if there are multiple IEDs).

   The IED is placed on the ground and a wire coil object is floating in front of you.

2. Move to another position.

   The wire spools off as you move and there is a HUD indication of how much wire you have spooled off, and how much of the 200 meter length is left.

3. When you have reached your destination you can do one of the following:

   - Select user action **Detonate Wire Controlled IED x** to detonate while still holding the coil.
   - Select **Drop Wire IED x** to drop the coil on the ground. This allows you to move about while the wire remains in place. If you remain within 5 meters of the coil, the **Detonate Wire Controlled IED x** is still available.

   Image-7: Wire Controlled detonation

Timer

A type of fuse. When selected, the **Timer** field appears. The administrator can specify the time to detonation from scenario start.

NOTE

If an IED of this **Trigger Type** is attached to a unit (see Attaching IEDs to Units and Vehicles (below)), the IED Editor Object disappears from the Editor Objects List and is instead placed in the unit Equipment Inventory.

NOTE

The timer cannot be adjusted by players in the scenario.

Timer Player Activated

A type of fuse. Allows the administrator to place an IED that can be picked up, replaced, and detonated by a player-specified timer. For more information on how the player can set the IED timer, see Improvised Explosive Devices (on page 84).

NOTE

If an IED of this **Trigger Type** is attached to a unit (see Attaching IEDs to Units and Vehicles (below)), the IED Editor Object disappears from the Editor Objects List and is instead placed in the unit Equipment Inventory.

NOTE

For the **Radio**, **Cell Phone**, **Passive IR**, and **Wire Controlled** IED trigger types, some form of in-game action is required before they become active. Merely placing them using VBS Editor is not sufficient to activate them.

3.3 Equipment Inventory

Picking up the IED using the Equipment Inventory (see Equipment Inventory in the VBS4 Trainee Manual) or the user action has exactly the same result.

However, the same does not apply to dropping the IED, because there is a difference between just dropping it on the ground and placing (arming) it. If you drop the IED using the Inventory, you are merely dropping it. The only way to set / arm an IED is to use the **Place IED** user action.

3.4 Attaching IEDs to Units and Vehicles

You can attach IEDs to units or vehicles using standard linking techniques (see Linking Editor Objects in the VBS4 Editor Manual), bearing the following in mind:

- Position the IED at a suitable location near the vehicle or unit.
- Remember that the IED object is attached to the other entity – so when the unit or vehicle moves, the IED does too.

- You can hide or unhide the IED by right-clicking it and selecting **Hide / Unhide IED** from the context menu.
- IEDs can be linked to other IEDs to form a daisy-chain using the **LShift + Drag** shortcut. Double-headed arrows on the connecting lines indicate that IEDs affect each other.

3.5 Attaching IEDs to Triggers

IEDs can be attached to triggers, so that they explode when the trigger condition becomes "true".

Follow these steps:

1. Create a trigger with the desired condition (for example, a radio call).
2. Right-click the **IED** and select **Attach to Trigger** from the context menu.
3. Drag the linking line to the respective trigger.

The IED is attached to the trigger.

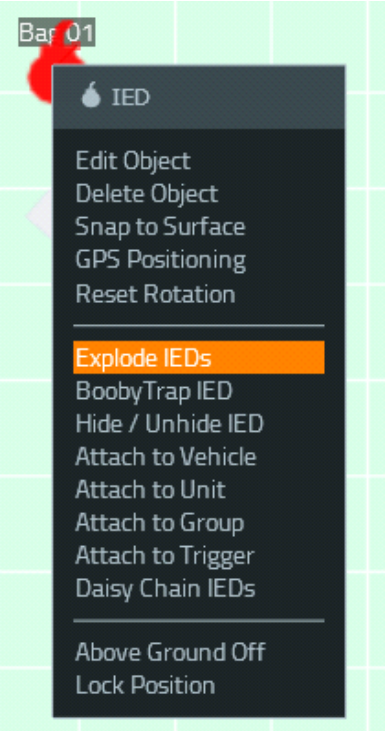
> **NOTE**
>
> A linked IED can still be detonated manually (using the VBS Editor context menu) or, if set to **Proximity**, by an approaching unit or vehicle.

3.6 Detonating an IED

In Execute Mode administrators can detonate an IED at any time using the **Explode IED** context menu option.

Also, a player driving a vehicle with an attached IED or acting as a suicide bomber has the **DETONATE IEDS** option in their Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual), meaning they can blow themselves up at any time.

Image-8: Detonating an IED



You can activate multiple triggers / detonate IEDs, using the Script Editor Object.

Follow these steps:

1. In the Editor Objects List, select **Script** and place the Script Editor Object on the map.
2. In the **Filter** drop-down, select **Special Scripts**.
3. In the **Script File** drop-down, select **Activate Trigger(s)** or **Explode Linked IED**.
4. In the **Execute Globally?** drop-down, select whether the script should run locally or globally in a multiplayer scenario:
    - **Execute Only on Client Where Condition is True** - Runs the script only on clients, where the **Condition** setting (see step 5) is true.
    - **Execute on Every Client, Even if Condition is False on Some** - Runs the script on all the clients.

5. In **Condition**, specify the Boolean condition for the linked triggers / IEDs (see step 8) to be executed.
6. In the **Repeatedly** drop-down, set whether the condition should be evaluated repeatedly or not:
   - **Do Not Repeat** - Evaluate the condition only once.
   - **Repeat When Condition is True Again** - Evaluate the condition every time it returns true.
7. Click **OK**.
8. Right-click the Script Editor Object, select **Link to Condition Trigger** / **Link IED**, drag the arrow and click the trigger / IED you want to link.

   Repeat this step for as many triggers / IEDs as you need.

When the scenario runs, the Script Editor Object activates / detonates the linked triggers / IEDs, according to the set condition.

For more information, see the Script Editor Object in the VBS4 Editor Manual.

3.7 Knock-Out Effect

Blast wave effects from IEDs and other explosions can knock out a unit, causing the screen to black out for a period of time. This effect is based on explosion size and proximity to the blast. Units can also experience dizziness (screen movement) for a period of time after they regain consciousness. Even if a unit is not knocked out they may still experience dizziness.

The listed IED settings produce the following effects in VBS4:

IED Setting	Description
Deadly	Causes severe damage and knockout at farther ranges.
Wound Only	Causes damage and knockout for units close to the explosion.
Fake (No Damage)	Causes no damage but causes a knockout.

NOTE

When units are in a vehicle they do not experience knockout.

Vehicles with larger caliber weapons can cause knockout when a person stands close enough to the weapon barrel. Explosions from weapons can cause knockout at close range.

3.8 On Explode Code

It is possible to run a script when the IED explodes. This script can access several parameters passed in through `_this`:

```
[
- THE IED OBJECT
- ASSIGNED VEHICLE VARIABLE NAME IF ANY - STRING
- TYPE OF IED CHARGE - STRING (class name)
- TYPE OF EXPLOSION - STRING  "normal"/"wounding"/"fake"
- WAS IED BOOBYTRAPED? - BOOLEAN
- DISARM DURATION - SECONDS
- CAN THE IED BE JAMMED BY CREW? - BOOLEAN
- DETONATION TYPE - STRING "proximity"/"PressurePlate"/"Admin"
- PROXIMITY DETONATION RADIUS - SCALAR (IF "proximity")
- PROXIMITY DETONATION SIDE - STRING "West"/"East"/"All"...
- PRESSURE PLATE SIZE A - SCALAR
- PRESSURE PLATE SIZE B - SCALAR
- PRESSURE PLATE SIZE X - SCALAR
- PRESSURE PLATE SIZE Y - SCALAR
- WEIGHT OF PRESSURE PLATE - SCALAR
- PROXIMITY TRIGGER - IF EXISTS LOCALLY, ELSE NULL
]
```

4. Enabling Automatic Towing

The Towing Module allows automatic rope-towing and trailer-hitching between vehicles.

For information on more complex towing simulation, see Towing Vehicles in the VBS4 Trainee Manual.

Follow these steps:

1. In the **Editor Objects List**, select **Module**.
2. Expand the **Module** drop-down, select **Towing** and click **OK**.

   The Towing Object Properties dialog opens:

3. Set the Towing Options (below).
4. Click **OK**.

The Towing icon appears on the map.

In addition, see the following Towing Module-related functionality:

- Linking (on the next page)
- Triggers (on page 41)
- Towing Scripting Functions (on page 42)

4.1 Towing Options

The Towing Module has the following options that can be set:

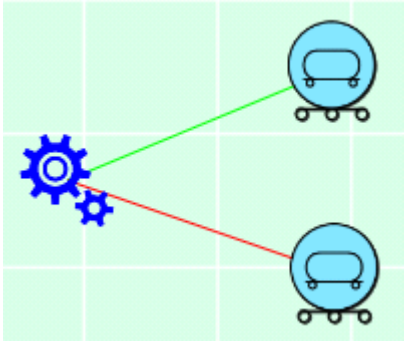
Towing Option	Description
Type	Towing type. Can be: • **Rope Towing** - Select this option to attach a rope between two vehicles. • **Trailer Hitch** - Select this option to hitch a trailer to a vehicle.

Towing Option	Description
Activate when	If you want to use Triggers (on the next page) with a hitch, you may need to adjust the following: 1. Expand the first **Activate when** drop-down and select one of the following options: • **At least one trigger is activated** - At least one Trigger must be activated for hitching to take place. • **All triggers are activated** - All Triggers on the map must be activated for hitching to take place. 2. Expand the second **Activate when** drop-down and select **AND / OR** to control the relationship between Triggers and the condition code. Either both are true or just one of them. 3. Enter **true** of **false** in the condition code field.

4.2 Linking

To make the Towing animation work you must link the vehicles / trailers to the **Towing Editor Object**.

Image-9: Towing and towed vehicle linked to the Towing Editor Object



Follow these steps:

1. Place two vehicles or a vehicle and a trailer on the map.

> **NOTE**
>
> If you select **Rope Towing** in the Object Properties dialog, ensure that the two vehicles are no more than 20 meters apart, preferably with the towing vehicle in front.

2. Right-click on the **Towing** icon and select one item from the list:

   If two vehicles are present:

   - **Select Towing Vehicle** - Select to link to the vehicle that is towing.
   - **Select Towed Vehicle** - Select to link to the vehicle being towed.

   If a vehicle and a trailer are present:

   - **Select Tractor** - Select to link to the vehicle that is towing ("Tractor" is the name for any vehicle towing a trailer).
   - **Select Trailer** - Select to link to the trailer.

3. Selecting any of these options closes the list and attaches a black arrow to the cursor.
4. Drag the mouse and click the **vehicle / trailer** you want to link to.

   Link to a **towing vehicle / tractor** and the arrow turns green. Link to a **towed vehicle / trailer** and the arrow turns red. Both color changes confirm that the objects are linked to the Towing Editor Object.

5. Repeat steps 2 to 4 to link the other vehicle / trailer to the Towing Editor Object.
6. Preview the mission:

If you selected **Rope Towing** in the Object Properties dialog, you see a rope between the two vehicles. If you selected **Trailer Hitch**, the trailer is attached to the towing vehicle (unless there are Triggers (below) present).

4.3 Triggers

Triggers can be linked to the **Towing** module to start vehicle towing, based on a trigger condition. Triggers can be also added to the mission when the **Trailer Hitch** option is selected in the Object Properties dialog. This means that trailers can be hitched to vehicles when triggers are activated rather than the moment a vehicle and trailer are linked to the Towing Editor Object.

Follow these steps:

1. With a trailer and vehicle placed on the map, add a Trigger (see Triggers in the VBS4 Editor Manual).
2. Right-click the **Towing Editor Object** and select **Link to Condition Trigger** from the menu.

   The menu closes and a black arrow is attached to the cursor.

3. Click the **Trigger Editor Object**.

   The arrow turns purple, indicating that the Trigger is linked to the Towing Editor Object.

4. Preview the mission.

When the towing vehicle reaches the Trigger, the trailer is automatically hitched to it.

4.4 Towing Scripting Functions

The following towing scripting functions are available:

Scripting Function	Description
fn_tow_towParent (https://sqf.bisimulations.com/display/SQF/fn_tow_towParent)	Returns the parent vehicle that tows the given child vehicle.
fn_tow_towChild (https://sqf.bisimulations.com/display/SQF/fn_tow_towChild)	Returns the child vehicle that is towed by the given parent vehicle.
fn_tow_canTow (https://sqf.bisimulations.com/display/SQF/fn_tow_canTow)	Checks if a parent object can tow a child object using a given towing mode.
fn_tow_canHitch (https://sqf.bisimulations.com/display/SQF/fn_tow_canHitch)	Determines if a given child object can be hitched to a given parent object.
fn_tow_startTow (https://sqf.bisimulations.com/display/SQF/fn_tow_startTow)	Initiates towing between parent and child vehicles using a given towing mode.
fn_tow_startHitch (https://sqf.bisimulations.com/display/SQF/fn_tow_startHitch)	Initiates trailer towing for given parent and child objects.
fn_tow_startRopeTow (https://sqf.bisimulations.com/display/SQF/fn_tow_startRopeTow)	Initiates rope towing for given parent and child objects.
fn_tow_stopTow (https://sqf.bisimulations.com/display/SQF/fn_tow_stopTow)	Terminates towing between parent and child vehicles.
fn_tow_stopHitch (https://sqf.bisimulations.com/display/SQF/fn_tow_stopHitch)	Terminates trailer hitching for given parent and child objects.
fn_tow_stopRopeTow (https://sqf.bisimulations.com/display/SQF/fn_tow_stopRopeTow)	Terminates the rope towing connection between specific vehicle points.
fn_tow_getRopeTowConnections (https://sqf.bisimulations.com/display/SQF/fn_tow_getRopeTowConnections)	Returns a list of all rope towing connections for a given vehicle and any other vehicles in the vehicle chain.

Scripting Function	Description
fn_tow_getAvailableTowPoints (https://sqf.bisimulations.com/display/SQF/fn_tow_getAvailableTowPoints)	Returns a list of available (not locked) towing points on a given vehicle and its trailers.
fn_tow_setPointLocked (https://sqf.bisimulations.com/display/SQF/fn_tow_setPointLocked)	Sets the locked state of a towing memory point on a vehicle.

5. Enabling CREW

The CREW jamming device, known in the military as Counter Radio-Controlled Improvised Explosive Device (RCIED), is a vehicle mounted or portable electronic jamming system designed to prevent the detonation of IEDs.

This topic discusses the following:

For information about using CREW as a trainee, see Using CREW (on page 68).

5.1 CREW Link Editor Object

To equip an entity with CREW capability, the **CREW Link** Editor Object (EO) is required.

Follow these steps:

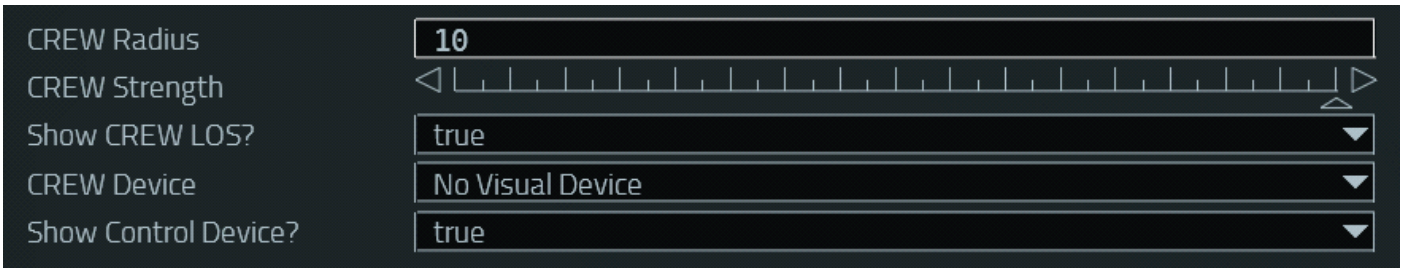
1. In the Editor Objects List, select **CREW Link** and click the map, where you want to place the CREW Link EO.
2. In the **Object Properties** dialog, set the CREW Link Options (on the next page).
3. Click **OK**.

The CREW Link EO is placed on the map.

The CREW Link EO must be linked to an entity, see Linking Editor Objects in the VBS4 Editor Manual and Entity Capability (on page 46).

5.1.1 CREW Link Options

The CREW Link EO has the following options in its Object Properties dialog.



Option	Description
Crew Radius	Defines the jamming radius, in meters. This setting can be visualized on the 2D Map / in 3D Camera View (see Range Visualization (on page 50)).
Crew Strength	Use the slider to set the jamming strength, which defines how far the CREW can penetrate a solid object.
Show CREW LOS?	If set to **true**, occlusion of the jamming effect by objects / terrain is shown in Execute mode / C2 (see Line of Sight (LOS) (on page 49)).
CREW Device	Use the drop-down to select the model CREW device you want to use. The default is **No visual device**, meaning that a "device" is present but it cannot be seen in the scenario. To select a specific device that units can see / handle in-game, choose one of the following options: **For vehicles:** • Chameleon (Desert / Woodland variants) • Duke (Desert / Woodland variants) • Rhino **For units:** • Guardian Manpack • Thor Manpack (Low / Mid / High Band variants) For more information about CREW devices, see Vehicle Devices (on the next page) and Portable Manpacks (on page 47).
Show Control Device	If set to **false**, Chameleon or Duke is selected.

5.2 Entity Capability

You can equip either vehicles (see Vehicle Devices (below)) or units (see Portable Manpacks (on the next page)) with CREW capability by linking the CREW Link EO to either entity type.

5.2.1 Vehicle Devices

Linking the CREW Link EO to a **vehicle** causes it to be automatically equipped with the device selected using the CREW Device (on the previous page) option.

If you select **No Visual Device**, no physical CREW device is present. However, trainees can still access the CREW controls in the Quick Menu (see Using CREW in the VBS4 Trainee Manual).

If you select **Chameleon** / **Duke** / **Rhino**, a physical CREW antenna is attached to the vehicle.

Vehicle with a Chameleon CREW antenna attached.

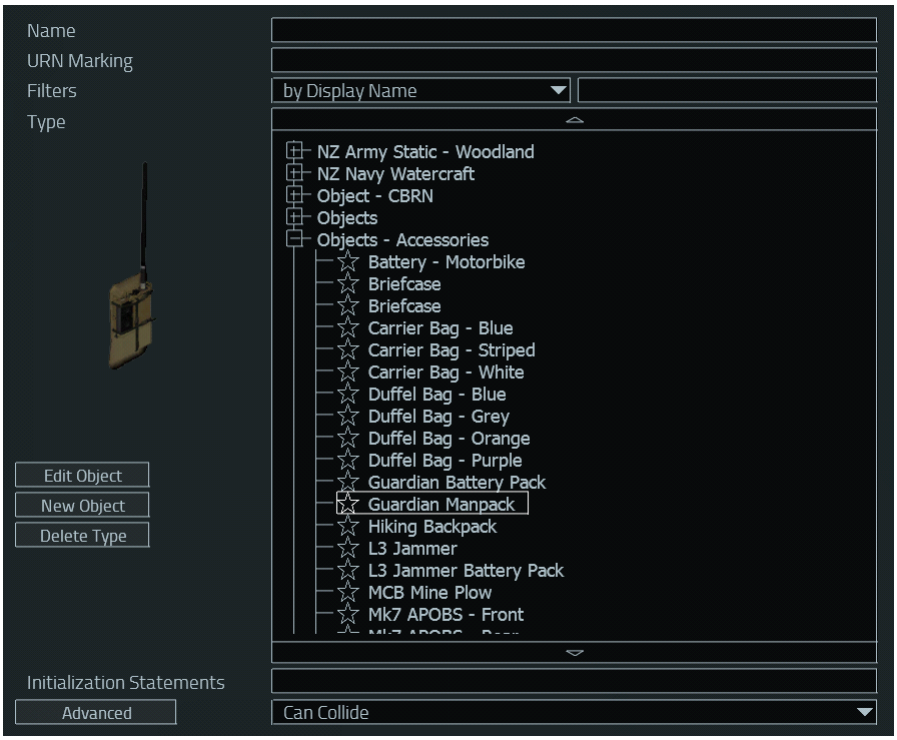
5.2.2 Portable Manpacks

Linking the CREW Link EO to a **unit** causes them to be automatically equipped with the physical manpack device selected using the CREW Device (on page 45) option.

Alternatively, Guardian and Thor manpacks and their corresponding spare battery packs are available as objects. These objects can be added to a scenario in the VBS Editor, and retrieved by trainees during runtime.

> **NOTE**
>
> Manpacks retrieved by trainees do not require the CREW Link EO. The CREW Link Options (on page 45) are hardcoded for retrieved manpacks. Line of Sight (LOS) (on page 49) and Range Visualization (on page 50) functionality is available for retrieved manpacks.

Image-10: Guardian manpack selection



Follow these steps:

1. In the Editor Objects List, select **(F8) Objects** and double-click on the map where to want to place the manpack / battery pack.

2. In the Object Properties dialog, go to **Objects - Accessories** and select one of the following:
   - **Guardian Battery Pack**
   - **Guardian Manpack**
   - **Thor Battery Pack**
   - **Thor Manpack (High, Low, Mid-Band)**
3. Click **OK**.

The manpack / battery pack is placed on the map.

> **NOTE**
>
> While visually identical, Guardian battery packs only work with Guardian manpacks, and Thor battery packs only work with Thor manpacks. The difference between the three types of Thor manpacks (High, Low, Mid-Band) is purely visual.

Object Variables

The following object variables are assigned to manpacks, and can be used to customize a scenario:

- **VBS_CREW_BATTERY_LIFETIME** - Modifies the number of seconds required for a battery pack to go from a full charge of 100% to 0% (default is `3600` seconds).

  For example, the following `setVariable`, `"VBS_CREW_BATTERY_LIFETIME", 300`, depletes a battery pack with 100% charge to 0% charge in 5 minutes.
- **VBS_CREW_BATTERY_CHARGE** - Modifies the battery pack charge as a percentage (`0` = empty, `100` = fully charged).
- **VBS_CREW_BATTERY_DISCHARGE_RATE** - Modifies the multiplier of power consumption (default = `1`).

To implement an object variable, follow these steps:

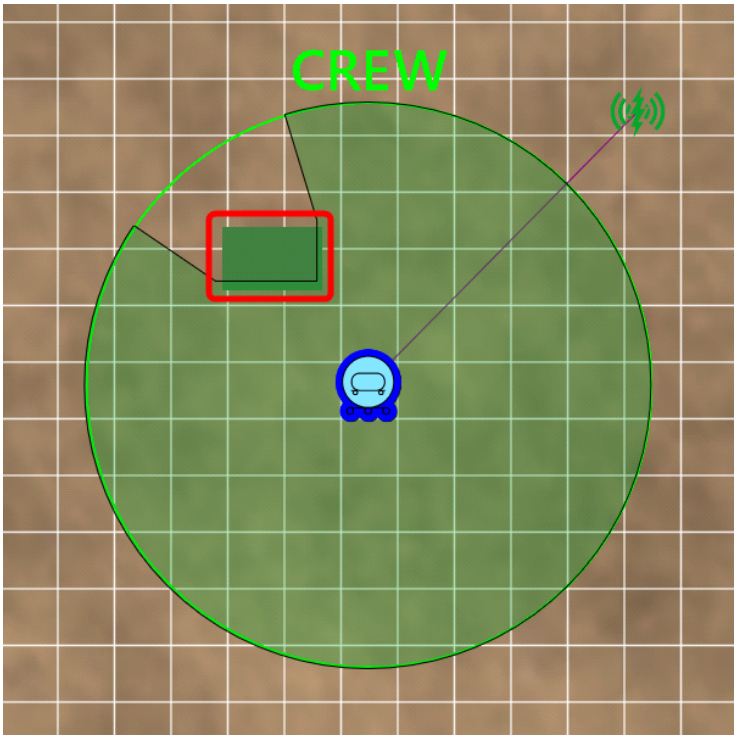
1. Double-click the **manpack** to open the Object Properties dialog.
2. Type or paste the following in the Initialization Statements field:

   ```
   this setVariable ["x", y]
   ```
3. Replace `x` with the desired object variable (for example: `VBS_CREW_BATTERY_LIFETIME`).
4. Replace `y` with the desired numerical modifier (for example: `300`).
5. Click **OK**.

5.3 Line of Sight (LOS)

Occlusion of the jamming effect by objects / terrain is shown in Execute Mode / C2 on the 2D Map, blocking the LOS. The following image shows the LOS obstructed by a building (marked by a **red** rectangle).

> **NOTE**
>
> The Range Visualization (on the next page) setting **2D Fill** must be disabled in order to see the obstructed LOS effect.

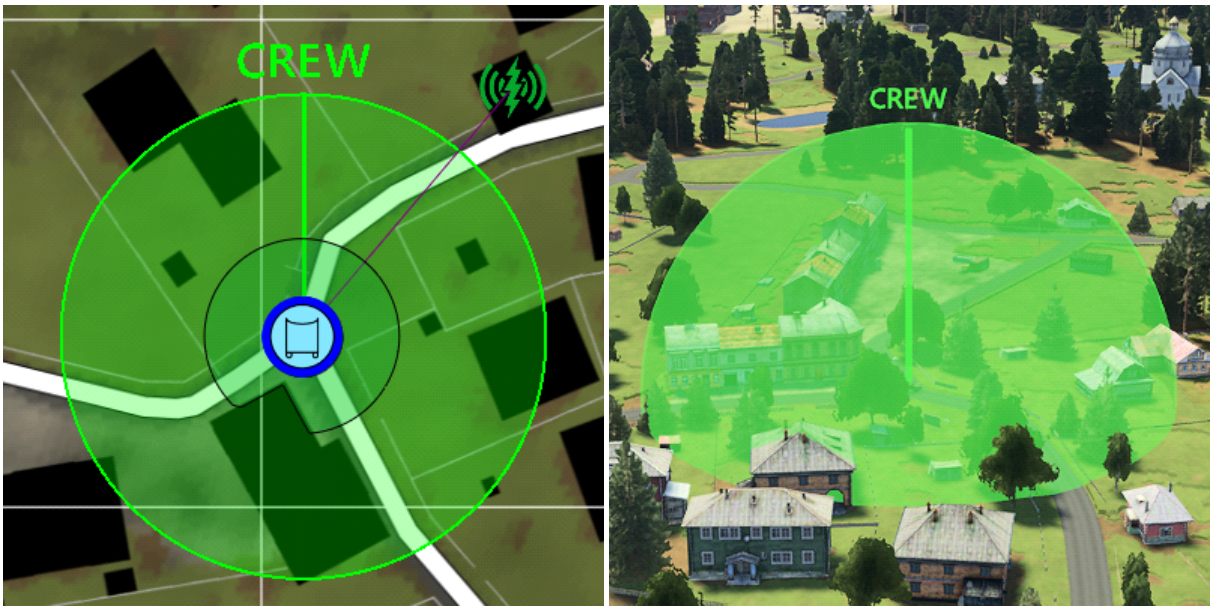


5.4 Range Visualization

In VBS4, the Crew Radius (on page 45) of the CREW jamming device can be displayed as a range visualization.

> **NOTE**
>
> Use the Range Visibility Settings in the VBS4 Administrator Manual to enable / disable the entire range visualization or individual elements of it.
>
> Range visualizations can only be seen by scenario Administrators and Instructors, not Trainees.

Image-11: 2D and 3D range visualization



5.4.1 Portable Manpack Battery

The range visualization of units with Portable Manpacks (on page 47) changes color to indicate the remaining percentage (%) power of the battery pack.

Color	%	Color	%
Green	100	**Orange**	50
Yellow	75	**Red**	25

No color indicates that the battery pack is completely empty and must be replaced.

5.5 Limitations

The CREW system has the following limitations:

- CREW does not affect pressure plate triggered IEDs, or administrator detonated ones (for more information, see Placing Improvised Explosive Devices (on page 27)).
- Adding / deleting the CREW Link EO during a multiplayer scenario may not be reflected on other clients.
- Manpacks added to the inventory of a unit using the functions mentioned in Edit Equipment Loadout cannot be activated.

6. Buffalo

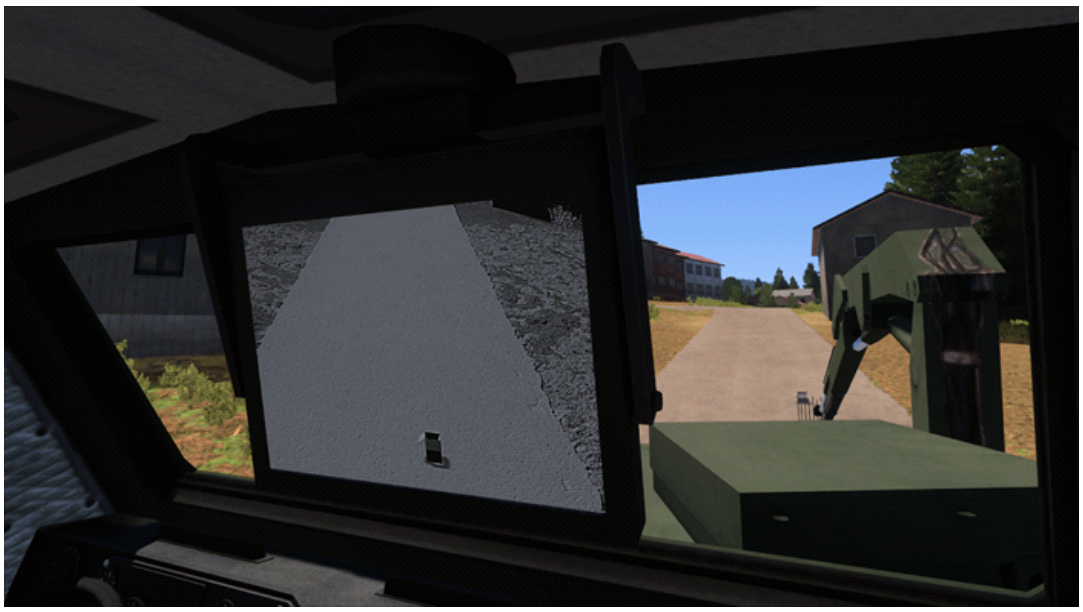
The Buffalo vehicle (any of the **Buffalo** models in VBS4) is equipped with an arm for picking up objects (such as IEDs). The arm also has a camera for more accurate positioning.

Follow these steps:

1. If you do not start the mission in the vehicle, approach the vehicle, press **Interact with Vehicle** (**U**) to access the Interact with Vehicles Interface (IWV) (see the VBS4 Trainee Manual), and select the Commander position.
2. In the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual), select **VEHICLE > OPERATE ARM**.
3. Use the arm controls to move the arm and pick up the object:

   - Select the arm-movement controls in the drop-downs.
   - For each control, use the slider to move the arm.
4. Use the arm camera monitor to enable more accurate positioning.

Image-12: Buffalo cabin with arm camera monitor



5. If the object is an IED:
    a. Press **Interact with Vehicle** (**U**) to access the Interact with Vehicles Interface (IWV) (see the VBS4 Trainee Manual), and select the Driver position.
    b. In the Quick Menu, select **VEHICLE > DETONATE VBIEDS**.

> **NOTE**
> The following considerations apply:
> - The Commander can operate the arm, but not detonate IEDs.
> - The Driver can detonate IEDs, but not operate the arm.

6. To drop the object, select **VEHICLE > DROP OBJECTS** in the Quick Menu.
7. To stow the arm, select **VEHICLE > STOW ARM** in the Quick Menu.

For information about vehicle controls, see the following topics in the VBS4 Trainee Manual:

- Land Vehicle Controls
- Vehicle Command Controls
- VBS4 Controls

7. Husky T-MDV

VBS4 includes advanced Husky functionality, which enables a range of training applications.

There are three main models of the Husky T-MDV vehicle in VBS4:

- AU Army Wheeled - Desert and Woodland
- CA Army Wheeled - Desert and Woodland
- US Army Wheeled - Desert and Woodland

The following functionality is supported:

NOTE

Husky T-MDVs without the GPR or IA naming do not have animated metal detectors (although the functionality is present).

7.1 Metal Detector (MD)

The metal / mine detector (MD) is available on both the IA and GPR variants. The MD can be activated / deactivated and must be active in order to mark hazards.

Follow these steps:

1. To activate the MD, select **VEHICLE > ACTIVATE MINE DETECTOR** in the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual).

   This moves the MD to a deployed state. Once active, the MD automatically marks any hazards (see Marking Hazards (on page 60)).

2. Use the following controls:

MD Action	Control	Applicable To
Activate mine detector	User Defined 16	All Husky T-MDV variants of all countries
Deactivate mine detector	User Defined 16	

3. When the MD is switched on, drive over a mine.

   When a mine is detected, a radio message appears.

   NOTE

   You must not exceed a speed of 20 km/h in order for the mine to be marked.

   - At speeds < 20 km/h, a low-pitched sound is produced, once the vehicle has detected the mine and you see a white circle drawn around the mine.
   - At speeds > 20 km/h, a high-pitched sound is produced and a radio message appears, informing you that you must drive slower than 20 km/h, in order to mark the mine.

4. To deactivate the MD, select **VEHICLE > DEACTIVATE MINE DETECTOR** in the Quick Menu.

   This moves the MD back to the stowed state, and stops to automatically mark hazards.

7.2 Ground Penetrating Radar (GPR)

The GPR variant of the Husky T-MDV has a ground penetrating radar attached to the front, which detects mines and IEDs, located on the ground underneath it.

Use **VEHICLE > ACTIVATE GPR** in the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual) to activate the GPR.

Once the GPR is deployed, the GPR output appears in the top-right corner of the screen:

- The US Husky T-MDV has a single-panel GPR display.
- The AU Husky T-MDV has a four-panel GPR display.

The four-panel GPR display allows more accurate visualization of the hazard location under the GPR panels. A four-panel GPR display also shows hazards detected in between two GPR panels.

Image-13: A four-panel GPR display showing a mine in between panels

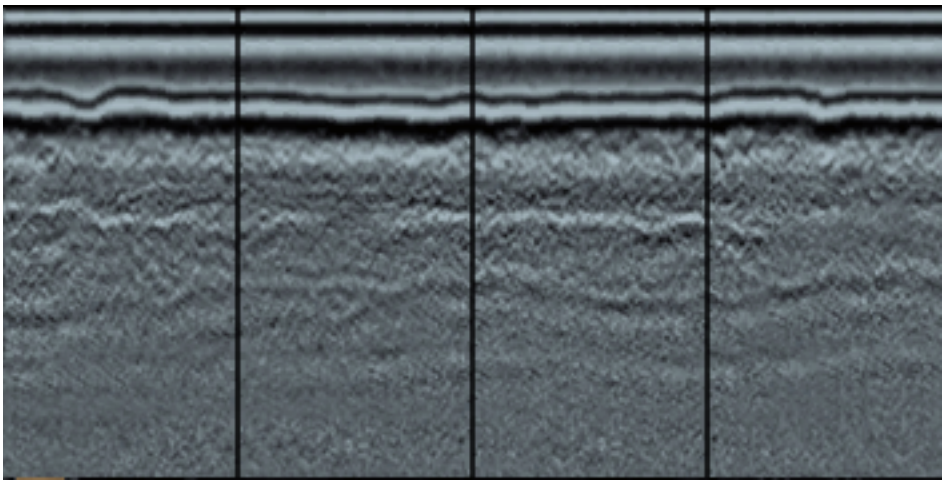
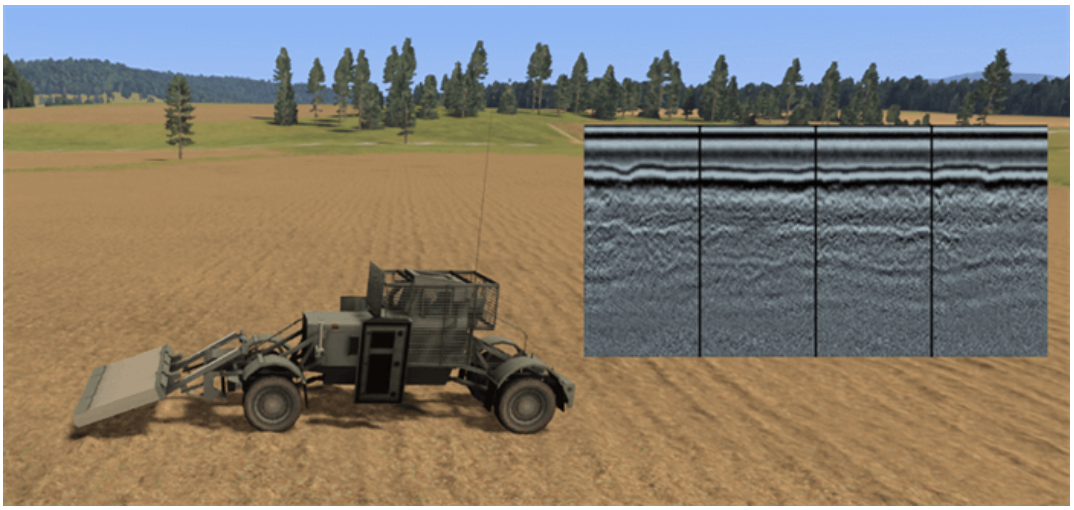


Image-14: Husky T-MDV GPR display



To modify the GPR image, see **Modify the Husky T-MDV GPR Image** in the VBS Developer Reference.

> **NOTE**
> The Developer Reference is in the `\docs\` folder of the VBS Developer Suite installation.

Use the following controls:

GPR Action	Control	Applicable To
Activate GPR	User Defined 15	Husky T-MDV GPR only, all countries
Deactivate GPR	User Defined 15	
Activate mine detector	User Defined 16	All Husky T-MDV variants of all countries
Deactivate mine detector	User Defined 16	

Use the **Deactivate GPR** action to stow the GPR, and turn off the output screen.

7.3 Interrogator Arm (IA)

The IA variant of the Husky T-MDV has an Interrogator Arm (IA) for picking up and disarming IEDs.

Image-15: Husky Interrogator Arm

Follow these steps:

1. Use **VEHICLE > OPERATE IA** in the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual) to show the menu for operating the IA.

2. Use the following controls (Husky T-MDV IA only, all countries):

IA Action	Control	IA Action	Control
Rotate arm left	User Defined 1	Secondary boom up	User Defined 7
Rotate arm right	User Defined 2	Secondary boom down	User Defined 8
Main boom up	User Defined 3	Claw open	User Defined 9
Main boom down	User Defined 4	Claw close	User Defined 10
Extend boom	User Defined 5	Stow IA	User Defined 11
Retract boom	User Defined 6	Drop objects	User Defined 12
		Disarm IEDs	User Defined 13

3. Use the IA camera to assist you in operating the IA.

   The IA variant of the Husky has three ways of viewing the IA camera:

   - On-screen in the upper-right corner.
   - On the screen in the Husky cabin.
   - Full-screen.

   By default, the camera is visible on-screen, in the top-right corner and in the Husky cabin.

   Do any of the following:

   - To toggle the on-screen display in the upper-right corner on / off, press **LShift + Toggle Optics** (**V**).
   - To toggle full-screen optics on / off, press **Toggle Optics** (**V**). When using the full-screen optics, access the animations menu by pressing **Perform Action** (**Enter**).

4. To pick up an IED, maneuver the IA , so that the claw is close to it. Once it is close enough, the IED automatically attaches to the claw and the following actions become available:
   - **Disarm IEDs** - Disarms the IED, so that the object is harmless.
   - **Drop Objects** - Drops the IED from the claw, so it falls to the ground.

   Image-16: Retrieving objects with the IA

5. To stow the IA, select **VEHICLE > STOW IA** in the Quick Menu.

   Invoking this action automatically moves the arm back to its stowed position.

7.4 Marking Hazards

When using the GPR or MD, it is possible to mark hazards with spray paint.

Husky T-MDV Type	Description
AU Husky T-MDV	**MD**: Automated process. Whenever the system detects a hazard, it is automatically marked. The MD must be activated to mark hazards. **GPR**: Hazards must be manually marked. To do so, use the Systems Menu (Y) with `GPR MARKING 1-4`, or use the **User Defined 11-14** controls that correspond to `GPR MARKING 1-4`, respectively. **NOTE** If a hazard is detected by the system, the spray is not deployed without using the action, and the spray does not automatically "snap" to the correct hazard location.
US Husky T-MDV	**MD**: Automated process. Whenever the system detects a hazard, it is automatically marked. The MD must be activated to mark hazards. **GPR**: Hazards must be manually marked. To do so, use **VEHICLE > DEPLOY MARKING SPRAY** in the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual) at any point and the ground gets marked at the current vehicle location. **NOTE** If a hazard is detected by the system, the spray is not deployed without using the action, and the spray does not automatically "snap" to the correct hazard location.

Image-17: Marking hazards

Image-18: GPR Systems Menu manual markings

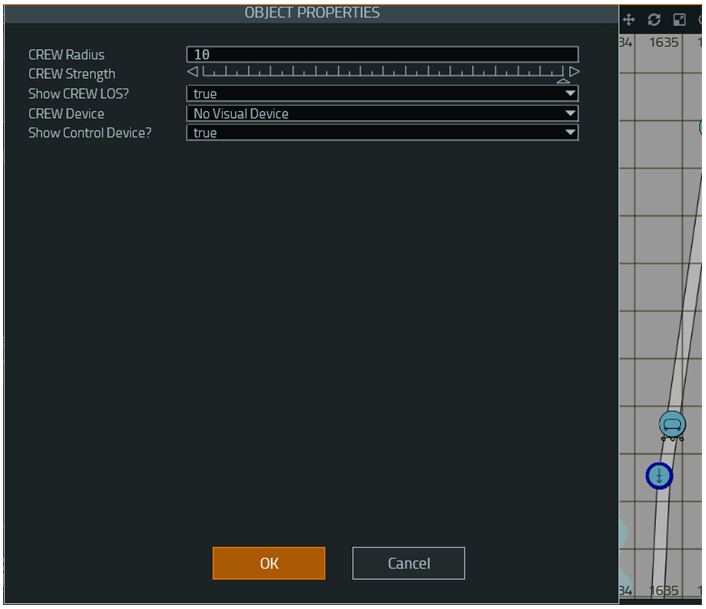
7.5 Trailers

Trailer variants of the Husky T-MDV come equipped with the Mine Detonation Trailer (MDT), which is a set of trailers designed to trigger any mines that have avoided detection. For more general information on trailers and towing, see Towing Vehicles (on page 75).

7.6 Force Protection Electronic Counter-Measures (FPECM)

All variants of the Husky T-MDV are compatible with the CREW system in VBS4 and operate in a similar manner to other vehicles.

Image-19: CREW Link



For more information, see Enabling CREW (on page 44).

8. Mine Clearing Rollers

A Mine Clearing Roller allows a vehicle to clear a path by rolling over mines and detonating them.

> **NOTE**
> Some mine types may incur damage from vehicles with Mine Clearing Rollers.

Image-20: M1132 Stryker ESV - M2 with a Mine Clearing Roller

Certain vehicle models are equipped with Mine Clearing Rollers:

- **AU Army Wheeled - Desert / Woodland > Bushmaster - Troop Carrier, Mag 58, SMR2**
- **US Army Wheeled - Woodland > M1132 Stryker ESV - M2 - Rollers**
- **US Army Wheeled - Woodland > M1132 Stryker ESV - Mk19 - Rollers**
- Any **Husky** suffixed with **Trailers**.

> **NOTE**
> The Husky T-MDV comes equipped with a Mine Detonation Trailer (MDT), which also rolls over mines and detonates them. For more information, see Trailers (on the previous page).

Follow these steps:

1. If you do not start the mission in the vehicle, approach the vehicle, press **Interact with Vehicle** (**U**) to access the Interact with Vehicles Interface (IWV) (see the VBS4 Trainee Manual), and select the Driver or Commander position.
2. If the roller is raised, in the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual), select the **VEHICLE > LOWER MINE ROLLER** action.

   > **NOTE**
   >
   > The action may only be available in one of the positions - Driver or Commander. Also, some vehicle models have the roller already lowered by default.

3. Drive or command the vehicle towards the mines.

Mines explode on contact with the mine roller attachment.

For information about vehicle controls, see the following topics in the VBS4 Trainee Manual:

- Land Vehicle Controls
- Vehicle Command Controls
- VBS4 Controls

9. MICLIC

The Mine Clearing Line Charge (MICLIC) is available on the following vehicles / objects:

- (F5) Empty Vehicle
  - US Army Tracked - Desert / Woodland - M1150 Assault Breacher Vehicle
  - US USMC Tracked - Desert / Woodland - M1150 Assault Breacher Vehicle
  - US Army Tracked - Desert / Woodland - M60 - AVLM
- (F8) Objects
  - Military - M154 MICLIC Launcher
  - US Army Wheeled - Desert / Woodland - Trailer M353 - MICLIC
  - GB Army Wheeled - Desert / Woodland - Python (Trailer)

> **NOTE**
>
> Tow the Trailers in the same way as any other trailer. For more information, see Towing Vehicles (on page 75).

The charges detonate all mines and IEDs within range. All other objects in range take damage according to the standard object model for explosions.

For how to use MICLIC, see:

- M1150 Assault Breacher and M60 AVLM (below)
- M154 Launcher and M353 Trailer (on the next page)
- Python Breacher (on page 66)

To place mines in the scenario, see Placing Mines (on page 23).

9.1 M1150 Assault Breacher and M60 AVLM

The M1150 ABV / M60 AVLM has two forward facing MICLIC launchers mounted in left and right launchers.

Follow these steps:

1. Do one of the following:
   - Take the Commander position in the M1150 ABV.
   - Take the Driver position in the M60 AVLM.
2. Press **Quick Menu** (**Left Windows**).

3. Prepare the launcher for firing with the **VEHICLE > RAISE LEFT / RIGHT LAUNCHER** Quick Menu options.
4. Position the vehicle facing the direction of fire.
5. Select the **VEHICLE > FIRE LEFT / RIGHT MICLIC** Quick Menu option to launch the MICLIC.

   The following happens:

   - M1150 ABV - The MICLIC is launched. When the rope is fully extended, select **VEHICLE > DETONATE LEFT / RIGHT MICLIC** in the Quick Menu to detonate the MICLIC.
   - M60 AVLM - The MICLIC is launched after 15 seconds. When the rope is fully extended, the MICLIC detonates automatically.

The MICLIC clears a path ~8m wide and 100m in length, starting around 60m from the launcher.

Image-21: Quick Menu on the M1150 ABV

9.2 M154 Launcher and M353 Trailer

The M154 MICLIC Launcher and M353 MICLIC Trailer have one MICLIC launcher that fires forward (towards and over the coupling equipment on the trailer).

Follow these steps:

1. Approach and look at the Launcher or Trailer, until the **Raise Launcher** 3D World Action appears (see 3D World Actions in the VBS4 Trainee Manual). Then, select it.

This prepares the launcher for firing.

2. Make sure that the **Fire MICLIC** 3D World Action appears. Then, select it.

After a few seconds the rocket fires and launches the charges. The MICLIC clears a path approximately 8m wide and 100m in length, starting around 60m from the launcher.

> **NOTE**
>
> There is no visualization of the rope connected to the rocket in flight, the rope only appears after the rocket has reached the full distance.

Image-22: 3D World Actions on the M353 Trailer

9.3 Python Breacher

The Python Minefield Breaching system consists of a trailer with a single rocket launcher, positioned at the rear of the trailer. The launcher fires a 228 meter long hose packed with explosives over the trailer in the direction of the coupling equipment.

Follow these steps:

1. Approach and look at the Launcher.
2. If you need to rotate the trailer, make sure that the **Rotate** 3D World Action appears. Then, select it.
3. Make sure that the **Raise Launcher** 3D World Action appears. Then, select it to prepare the

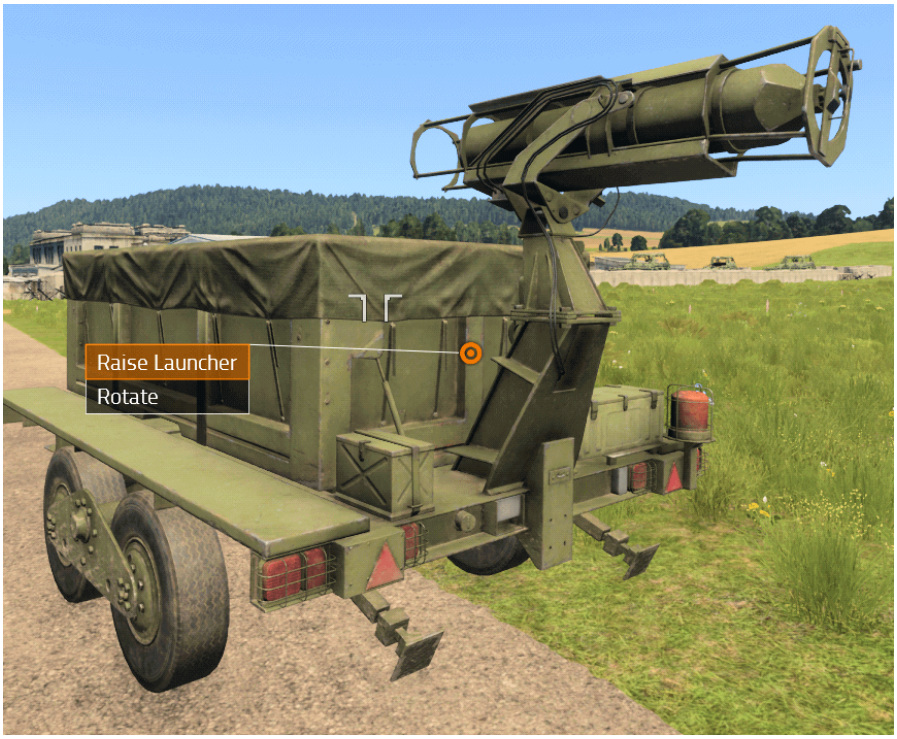
trailer for firing.

4. Make sure that the **Fire Python** 3D World Action appears. Then, select it to launch the hose.

After a few seconds the rocket fires and launches the hose. The Python clears a path of 180 to 200 meters long and 7.3 meters wide.

To stow the launcher, make sure that the **Lower Launcher** 3D World Action appears. Then, select it.

Image-23: 3D World Actions on the Python



10. Using CREW

CREW devices, also referred to as Counter Radio-Controlled Improvised Explosive Devices (RCIED), are available to you providing that you are in a vehicle equipped with CREW capability or have access to a manpack. VBS4 includes the following CREW devices:

For vehicles:

- Chameleon (Desert / Woodland)
- Duke (Desert / Woodland)
- Rhino

For units:

- Guardian Manpack and battery pack.
- Thor Manpack (High / Low / Mid-Band) and battery pack.

For information about CREW setup, see Enabling CREW.

10.1 Vehicles

Vehicle CREW devices are attached to vehicles by administrators, and can be a physical device (antenna) with an activation action, or just an activation action. The activation action is accessed using the Quick Menu (see Quick Menu Actions in the VBS4 Trainee Manual).

Open the Quick Menu and select **VEHICLE > ACTIVATE CREW** / **DEACTIVATE CREW**.

10.2 Manpacks

Manpack CREW devices (and their batteries) can be added to the Equipment Inventory by an administrator, or placed in a scenario as objects to retrieve.

> **NOTE**
>
> While visually identical, Guardian battery packs only work with Guardian manpacks, and Thor battery packs only work with Thor manpacks. The difference between the three types of Thor manpacks (High, Low, Mid-Band) is purely visual.

Image-24: Guardian manpack

10.2.1 Pick Up and Activate a Manpack

The following procedure contains a step-by-step explanation of how to retrieve and activate a manpack.

> **NOTE**
> You can only carry one manpack at a time.

Follow these steps:

1. Walk up to the manpack and look at it, until the **Pick up Guardian Manpack** / **Pick up Thor Manpack** 3D World Action appears (depending on the manpack you are pointing at), and select it.

   You are now carrying the manpack.

3. Press **Quick Menu** (**Left Windows**), and select **ACTIVATE CREW** to activate the manpack.
4. To check the remaining battery power, select **CHECK BATTERY LEVEL** in the Quick Menu.

   The percentage of remaining battery power displays at the top of your screen.

   > **NOTE**
   > This action is also available as a 3D World Action (see 3D World Actions in the VBS4 Trainee Manual) if the manpack is not carried and is close by when CREW is activated.

5. To conserve battery power, select **DEACTIVATE CREW** in the Quick Menu.

   The manpack is now deactivated and battery power is conserved.

   > **TIP**
   > The pre-installed battery begins to drain when CREW is activated. Deactivating CREW stops the battery power from draining.

6. Select **ACTIVATE CREW** to reactivate the device.

10.2.2 Battery Pack Replacement

Manpacks come pre-installed with a battery. However, when the pre-installed battery runs out of power, the dead battery must be replaced with a spare battery pack to enable you to reactivate the manpack.

> **NOTE**
> You can only change a battery that is completely dead.

Follow these steps:

1. Walk up to a battery pack, and do one of the following:
   - Look at the battery pack, until the **Pick Up** 3D World Action appears, and select it.
   - Press **Inventory** (**I**) and move the battery pack into your inventory.
2. Press **Quick Menu** (**Left Windows**), and select **CHANGE BATTERIES**.

   The battery is replaced.
4. In the Quick Menu, select **ACTIVATE CREW**.

10.2.3 Other Manpack Actions

The following additional manpack actions are available in the Quick Menu:

- **DROP GUARDIAN MANPACK** / **DROP THOR MANPACK** - If you are carrying the device.
- **CHANGE BATTERIES** - When a battery completely runs out of power. Can only be used if a spare battery pack is stored in your Equipment Inventory.

11. Using UGVs and Static Sensors

When you are close to UGVs, robots, or static sensors, the Quick Menu Actions and 3D World Actions are populated with controller functions (see User Actions in the VBS4 Trainee Manual).

> **NOTE**
> Unmanned vehicles and static sensors cannot be operated from inside standard vehicles. Player units must be on foot to access controller functions.

The following procedure explains the functions of a **Talon EOD** robot. In this case, the robot is cargo in an **Australian Bushmaster IMV SMR2**, so unload it from the vehicle first.

Follow these steps:

1. Do one of the following:
   - Outside the vehicle: Approach it, and select the **Unload Talon** 3D World Action.
   - Inside the vehicle: Press **Quick Menu** (**Left Windows**), and select **VEHICLE > UNLOAD TALON**.

   The robot is unloaded at the rear of the vehicle.
2. From a position outside the vehicle, approach the robot.
3. Select the **Enable Remote Control** 3D World Action, and then press **Quick Menu** (**Left Windows**), and select **CONTROL TALON**.

   > **NOTE**
   > Other unmanned vehicles have options such as **UGV CONTROLLER**, used to access the relevant controllers.

You are now in Camera Mode (on the next page) and in control of the robot.

> **NOTE**
> While you are in Camera Mode, control of your character is disabled.

You can use UGV Controls (on page 73) to move the robot around. In addition, the following options are made available in the **VEHICLE** category of the Quick Menu:

- **LIGHT ON / OFF** - Turns the onboard light on / off.
- **EXIT ROBOT** - Click to exit control of the robot.
- **PLACE CHARGE** - Click to place a charge.
  - **TOUCH OFF BOMB(S)** - Appears when the charge is placed. Click to detonate.
- **OPERATE MACHINERY** - Use to adjust / stow the arms of the robot.

To load the robot back onto the vehicle, do the following:

1. Ensure that it is close to the rear of the vehicle.
2. Select **EXIT ROBOT** in the Quick Menu.
3. Look at the vehicle, until the **Load Talon** 3D World Action appears. Then, select it.

11.1 Camera Mode

All unmanned vehicles have at least one Camera Mode, but some have several. For example, the Talon EOD robot has several. Press **Interact with Vehicle** (**U**) to cycle through the Camera Modes:

- **Main Camera**
- **Arm Camera**
- **Gripper Camera**
- **Rear Camera**

> **NOTE**
>
> If you press **U** in Rear Camera mode, you exit from the robot, and must press **U** again to get back in to Camera Mode.

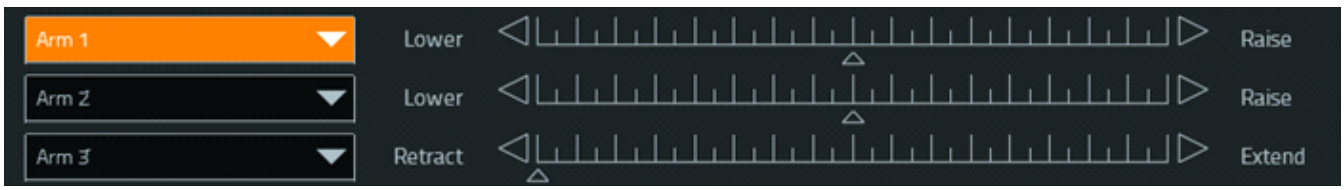
11.2 Operate Machinery

The arms of robots are usually controllable, using the Operate Machinery menu, which is accessed at any time using the Quick Menu or the 3D World Actions.

> **NOTE**
>
> While the Operate Machinery menu is in use, you cannot move the robot.

Follow these steps:

1. Do one of the following:
   - If in Camera Mode, select **VEHICLE > OPERATE MACHINERY** in the Quick Menu.
   - If not in Camera Mode, look at the robot, until the **Operate Machinery** 3D World Action appears. Then, select it.
2. The following menu opens at the bottom of your screen:



3. Use the drop-downs to select either **Arm 1 / 2 / 3** to operate them, or **Stow** to put them away.

   Depending on the items selected in the drop-downs, the slider bars to the right have corresponding actions:

   - **Unstow / Stow**
   - **Lower / Raise**
   - **Retract / Extend**

4. Click the **up arrow** under each slider bar, and move your mouse left or right to make adjustments.
5. After making your adjustments, click **Close** to close the menu.

You can move the robot remotely again.

11.3 UGV Controls

UGVs typically offer remote optics and camera systems.

Take direct movement control of unmanned ground vehicles from the appropriate unmanned vehicle control object.

UGV Control	Description	Control Name
U	Change point-of-view between operator and vehicle perspectives.	**Interact with Vehicle**

The following table lists the Land Vehicle Controls, defaults, and option names from the **Vehicle Controls** and **Infantry Controls** category filters in the Controls Settings in the VBS4 Administrator Manual:

Default Control	Description	Control Option Name
W	Forward	Car Forward
	NOTE **W** does not reach the maximum speed. Use **Car Fast Forward**.	
S	Brake / Reverse	Car Back
A / Mouse Left	Turn Left	Car Left / Car More Left
D / Mouse Right	Turn Right	Car Right / Car More Right
Q	Slow Forward	Car Slow Forward
E / LShift + W	Fast Forward	Car Fast Forward / Vehicle Turbo + Car Forward
LMB	Horn	Fire

> **NOTE**
>
> For Microsoft Xbox land vehicle controls, see Microsoft Xbox Controls in the VBS4 Trainee Manual.
>
> For Logitech 3D Extreme controls, see Controls Settings in the VBS4 Administrator Manual.

The following table lists the **Optics Controls**, see Controls Settings in the VBS4 Administrator Manual:

Default	Description	Control Option Name
V	Weapon Optics	Toggle Optics
Num +	Zoom In	Zoom In
Num -	Zoom Out	Zoom Out
N	Cycle Optics Mode	Cycle Optics (All Modes)
	On specific weapon systems, day / night-vision, and thermal imaging are available.	
LAlt + 1	Decrease Imaging Brightness	EO Decrease Brightness
LAlt + 2	Increase Imaging Brightness	EO Increase Brightness
LAlt + 3	Decrease Imaging Contrast	EO Decrease Contrast
LAlt + 4	Increase Imaging Contrast	EO Increase Contrast
LAlt + ~	Imaging Auto-Contrast and Auto-Brightness On / Off	EO Toggle Automatic

> **NOTE**
>
> The optics controls for Thermal Imaging Brightness and Contrast use the main keyboard numbers, not the Numpad numbers.
>
> For optics with multiple TI modes, the brightness and contrast for each mode is controlled independently.

12. Towing Vehicles

Towing enables you to attach towing cables to other vehicles to tow them to another location.

VBS4 supports a range of towing options:

- For Cable Towing, see Towing Positioning and Connection (below), and Towing Disconnection (on page 77).
- For A-Frame Towing, see A-Frame Towing (on page 78).
- For Winching, see Winching (on page 79).
- For specialized towing vehicles, see Wrecker Style Towing (on page 80).
- For automatic / simplified towing, see Enabling Automatic Towing (on page 39).

> **NOTE**
>
> Towing is available only for non-static vehicles, irrespective of their damage or fuel state. Static weapons and vehicles cannot be towed.

12.1 Towing Positioning and Connection

You need to position the towing vehicle by the towed / disabled vehicle correctly before a towing connection can be made.

Follow these steps:

1. To attach a towing cable to a vehicle, position your vehicle tow points within a short distance of the other vehicle tow points with no obstructions between them.
2. Press **Interact with Vehicle** (**U**) to interact with the towing vehicle.

   > **NOTE**
   >
   > You can still drive in interaction mode to help position the vehicle where towing is available.

3. Select the **Towing icon** to enter the towing interaction screen (you can access the towing interaction screen both inside and outside the vehicle, though some vehicles require the player to be inside the vehicle as a driver).

4. Click one of the tow points (marked with squares) on your vehicle to start a towing connection.

   When the tow point is connected, the icon changes to a **Disconnect icon** (marked with an X).

   > **NOTE**
   >
   > The connection operation can be canceled by clicking the **Disconnect icon**. Other vehicles show their tow points, and clicking one creates a connection or shows an indication for why the connection could not be made. You can also look around in towing connection mode to see the other vehicles better.

   Image-25: The tow points

5. Click **Cancel** or press **Esc** to exit the vehicle interaction screen.
6. Drive your towing vehicle.

The disabled vehicle is towed behind you.

12.2 Towing Disconnection

Once you finish towing the vehicle, you can disconnect it.

Follow these steps:

1. Press **Interact with Vehicle** (**U**) to interact with the towing vehicle.
2. Click the **Towing icon** to enter the towing interaction screen.

3. Click the **Disconnect icon** on the towed vehicle.
4. Click **Cancel** or press **Esc** to exit the vehicle interaction screen.

The vehicle is disconnected.

Additional Points:

- If your vehicle is capable of towing, the Towing icon appears on the left of the Interact with Vehicle (IWV) screen.
- Cross-over towing is supported for PhysX vehicles, enabling you to connect the two vehicles from many different angles.
- Static Weapons cannot be towed.

Image-26: Crossover Rope Towing

12.3 A-Frame Towing

On selected vehicles, A-Frame towing rigs are available with the A-Frame Towing icon.

Image-27: A-Frame Towing

> **NOTE**
>
> A-frame towing uses a light towbar for vehicles under 5000kg, and a heavy towbar for vehicles over 5000kg.

Image-28: A-Frame Disconnect Icon

To use A-Frame towing, follow these steps:

1. Position your vehicle hitch point < 2m from the other vehicle tow points with no obstructions.
2. Press **Interact with Vehicle** (**U**) to interact with the towing vehicle.

   > **NOTE**
   >
   > You can still drive in interaction mode to help position the vehicle where towing is available.

The disabled vehicle is towed behind.

12.4 Winching

You can winch an immobile vehicle (for example, one stuck in muddy terrain) using the M88A2 Recovery Vehicle.

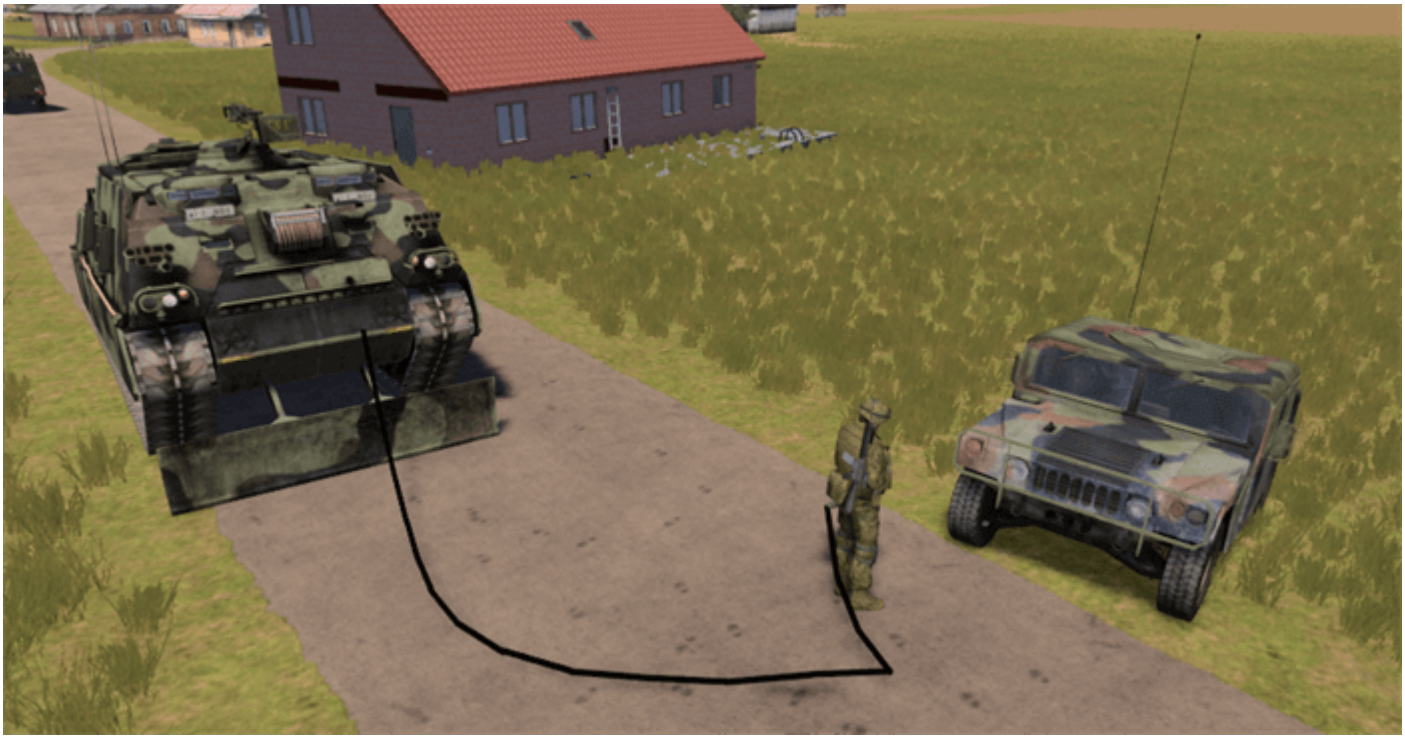
> **NOTE**
>
> Winching can only be done while the towing vehicle is stationary. Also, the engine cannot be turned on while the winch hook is grabbed and attached to another vehicle. The engine can be only turned on while the hook is detached from the towed vehicle and reeled back into the towing vehicle.

Follow these steps:

1. Get out of the disabled vehicle and approach the front of the M88A2 Recovery Vehicle.
2. Use the **Grab Hook** 3D World Action (see 3D World Actions in the VBS4 Trainee Manual) to pick up the winching hook.
3. Carry the hook to the immobile vehicle and use the **Attach Hook to Vehicle** Quick Menu action (see Quick Menu Actions in the VBS4 Trainee Manual).
4. Re-enter the M88A2 Recovery Vehicle as the driver and retract the winch using the **Retract Winch** Quick Menu action.

   The winching finishes automatically, or you can regulate and stop it automatically by using the **Stop Winch Retract** Quick Menu action.
5. When the vehicle is recovered, approach the front of the vehicle and detach the hook using the **Detach the Hook** 3D World Action, take it back to the front of the M88A2, and then use the **Reel in the Hook** 3D World Action.

Image-29: Running Out the Winch Line to an Immobile Vehicle



12.5 Wrecker Style Towing

A number of vehicles support wrecker style towing, these include:

Vehicle	Editor Category
MC3 - Wrecker	AU Army Wheeled - Desert / Woodland
Unimog U2450L (recovery)	AU Army Wheeled - Desert / Woodland
AHSVS Wrecker	CA Army Wheeled - Desert
M1089 Wrecker	US Army Wheeled - Desert / Woodland

NOTE

The M984A4 HEMTT - Wrecker variants only support rope towing. Further wrecker functionality to be added at a future date.

Image-30: Wrecker style towing

You can use wrecker towing on any vehicle with the correct memory points (for example, `towPoint_1_1` or `tieDown_1_1` - these memory points are present on most land vehicles).

Follow these steps:

1. Align the rear of the towing vehicle with the vehicle you want to tow.

   > **NOTE**
   > The vehicle to tow must be aligned within 45 degrees and 3 meters of the towbar.

2. Press **Interact with Vehicle** (**U**).
3. Click the **Hitch Using Tow Bar** icon.

   The vehicle you want to tow is attached to the wrecker.
4. To detach the towed vehicle, bring the wrecker to a complete stop.
5. Press **Interact with Vehicle** (**U**).
6. Click the **Unhitch Tow Bar** icon.

The towed vehicle is detached from the wrecker.

13. Bomb Detection Dog (MWD)

VBS incorporates a Bomb Detection Dog simulation, with custom animations, and a German Shepherd model. The Military Working Dog (MWD) can detect bombs, such as IEDs.

FEATURE NOTICE

Temporarily disabled for AI. See One AI in the VBS4 Release Notes.

The dog has the following model in VBS:

(F1) Unit > Animals > German Shepherd - Bomb Detection Dog (MWD)

13.1 Dog Attack and Other Capabilities

The Bomb Detection Dog has various controls, which are only available when a Player takes the part of the dog. Movement controls are similar to those for human units.

When playing as a dog, use your mouse to turn, and the following keys to move:

Keys	Action	Control Name
W	Forward	Move Forward
S	Move Back	Move Back
RCtrl + W	Sprint	Fast Forward
LShift + W	Run	Walk or Run Temporary + Move Forward
2 x W	Jog	Evasive Forward
X	Sit Down	Crouch
C	Stand	Stand Up
Z	Bark	Prone

As a dog, you can attack, and potentially kill human units using **Fire** (**LMB**) (as you would a trigger on a weapon).

Follow these steps:

1. Move towards the target unit.
2. Press **Fire** (**LMB**).

   Your dog character barks, growls, and jumps up at the target unit.

   If you move close enough to the target unit, they fall over, as if being pushed.
3. Repeatedly press **Fire** (**LMB**) to prolong the attack.

Over time the target unit is weakened, and eventually dies from their injuries.

Image-31: Unit after a dog attack

14. Improvised Explosive Devices

IEDs allow you to simulate explode-on-demand roadside bombs, suicide bombers, and vehicle-borne IEDs. For more information about configuring IEDs, see Placing Improvised Explosive Devices (on page 27).

Approach the IED to disarm or arm it.

To disarm the IED, look at it, until the **Disarm Bomb** 3D World Action appears (see 3D World Actions in the VBS4 Trainee Manual). Then, select it.

The IED is being disarmed.

> **NOTE**
>
> An IED takes some time to disarm (the actual time is set by the scenario designer). Not all IEDs can be disarmed. If the bomb is set to explode on proximity, it detonates as you approach it. There are no visual indicators to signify whether the bomb is set to proximity or not (only the administrator knows the status of the IED).

Image-32: An EOD disarms an IED

To arm the IED by setting a time fuse, select the **Set Time Fuse** 3D World Action, set the time to detonation in the time dialog, and click **OK**.

The IED timer is set, and the IED detonates after the set time elapses.

15. Mine Marker Kit

The Mine Marker Kit can be used by Trainees to detect and mark mines (see Placing Mines (on page 23)) with warning signposts. The Mine Marker Kit detects all the mine types available in VBS4.

NOTE

Administrators need to fulfill one of the following prerequisite criteria:

- Equip Trainees with the Mine Marker Kit by searching for **Mine marker kit** in the Equipment Inventory (see the VBS4 Trainee Manual). For more information, see Edit Equipment Loadout in the VBS4 Editor Manual.
- Place the Mine Marker Kit (found in **(F8) Objects > Mine marker kit** in the Editor) in the scenario for Trainees to pick up when the scenario runs. For more information, see Using Editor Objects in the VBS4 Editor Manual.

The following Trainee aspects are discussed:

- Retrieving the Mine Marker Kit (below)
- Using the Mine Marker Kit (on the next page)

Image-33: Mine Marker Kit

15.1 Retrieving the Mine Marker Kit

If the Mine Marker Kit is not in your Equipment Inventory, you can retrieve it.

Follow these steps:

1. Walk up to the **Mine Marker Kit**.
2. Press **Inventory** (**I**) to open your Equipment Inventory.
3. In the **Selected Container** window, click the **Mine Marker Kit**, and drag it into the **Carried Items** (top-right) window.

The Mine Marker Kit is ready for use.

15.2 Using the Mine Marker Kit

When the Mine Marker Kit is available in your Equipment Inventory, you can detect and mark mines using warning signposts.

Follow these steps:

1. Switch to the first-person view (see Character Views in the VBS4 Trainee Manual).
2. Go prone (see Character Movement and Posture in the VBS4 Trainee Manual).
3. As you get closer to the mine, a red bell-jar visualization appears around it, the **Place mine marker** 3D World Action appears (see 3D World Actions in the VBS4 Trainee Manual).

> **WARNING**
>
> The **Place mine marker** option is not available in the third-person view.

> **NOTE**
>
> The red bell-jar visualization appears for mines within a 5-meter radius from the Trainee unit, while the **Place mine marker** option appears for mines within a 2-meter radius from the Trainee unit.

4. Select the **Place mine marker** in the 3D World Action.

A warning signpost is placed to mark the mine.