



VR-Engage 1.5 Release Notes

This release note provides release-specific information for VR-Engage 1.5.

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System Requirements

This section lists supported platforms and software requirements.

Platforms Supported

VR-Engage 1.5 supports Windows 10. It has been built with Microsoft Visual C++ 15.0 (64-bit).

The VC 15 build is binary compatible with all MAK VC 14 products.

VR-Forces Compatibility

VR-Engage 1.5 is built against VR-Forces 4.8. However, it uses an updated data package. If you intend to use VR-Engage with VR-Forces, you should install the data package that comes with VR-Engage into VR-Forces 4.8. You do not have to uninstall the original VR-Forces 4.8 data. You can install the new data package on top of it. You should update the VR-Forces data package before you install the VR-Engage Add-ons for VR-Forces.

3D Video Cards Supported

VR-Engage 1.5 supports NVIDIA graphics cards that support OpenGL 4.5. VR-Engage does not support AMD (formerly ATI) graphics hardware.



VR-Engage strives to provide the best 3D scene quality possible and cutting edge visualization effects. To provide this functionality, VR-Engage takes advantage of OpenGL features that may not be supported on older video cards. When this is the case, you can disable these features, allowing VR-Engage to run in 3D modes.

For the best visual quality and highest performance you should use the most recent NVIDIA GeForce card. The minimum recommended card is the 9xx series.

Some laptops have an NVIDIA graphics card and an Intel graphics card. You must configure your computer to use the NVIDIA card. To do so:

1. Open the NVIDIA Control Panel (in the System Tray).
2. Select Manage 3D Settings.
3. Select Global Settings.
4. Select Preferred Graphics Processor.
5. Select High-performance NVIDIA Processor.



You should always try to use the latest drivers available for your video board.

Input Devices Supported

VR-Engage can support any device that Windows recognizes as a game controller.

VR-Engage has tested the following game controllers and has Direct Input configurations set up for them:

- ♦ Logitech F310
- ♦ Logitech F710
- ♦ Logitech G27 Steering Wheel
- ♦ Logitech G29 Driving Force game steering wheel
- ♦ Thrustmaster Hotas Warthog
- ♦ Thrustmaster T-Flight Hotas X

The mappings for these devices and the keyboard are described in Chapter 11, *Mouse, Keypad, and Controller Mappings*, in *VR-Engage Users Guide*.

Please contact support@mak.com for assistance configuring other devices.

Oculus Rift and HTC Vive HMD Support

VR-Engage 1.5 supports Oculus Rift CV1, HTC Vive, and HTC Vive Pro.

Qt Compatibility

VR-Engage 1.5 uses Qt 5.10.1.

Licensing

The VR-Engage application requires a VR-Engage run-time license in order to run. Internally, VR-Engage relies on VR-Vantage capabilities for its 3D visualization, VR-Forces capabilities for its ownship simulation, VR-Link for its networking, and so on, but these capabilities are built into VR-Engage and do not require separate run-time licenses of these MAK products.

MAK License Management

To run VR-Engage, you must install license management software. The License Manager files are not part of the VR-Engage installer. You can download them at:

- ♦ <http://ftp.mak.com/out/MAKLicenseManager-win64-setup.exe>

License manager support is available at:

- ♦ <http://www.mak.com/support/licenses>

VR-Forces Licensing Issues

With only a VR-Engage license, you can run VR-Engage, choose a terrain database to simulate on, create and place an entity, and control that entity. VR-Engage can only simulate and control a single entity at a time. When you "Change Role" and create a different entity to simulate, the entity you were previously simulating will be deleted and replaced by the new one.

If you are running a copy of VR-Forces on your network (which requires a separate VR-Forces license of course), then VR-Engage can interact with VR-Forces in a variety of ways:

- VR-Engage allows you to join a VR-Forces session and take manual control of one of the entities in the VR-Forces scenario. If you are controlling a VR-Forces entity, and then "Change Role" and ask to control a different entity, the original entity will still exist, as it is owned by VR-Forces.
- VR-Engage can initiate and receive changes to the terrain, for example, opening doors or destroying buildings. (VR-Forces acts as the dynamic terrain server).
- VR-Engage can reflect changes to time-of-day and weather that are published by VR-Forces.
- VR-Engage allows you to assign certain tasks to entities that are simulated by VR-Forces (for example, tell a subordinate to follow you, or move to a location you designate).

In order to simplify the startup workflow for certain use cases, VR-Engage gives you the ability to launch a VR-Forces back-end directly from the VR-Engage user interface, and to instruct VR-Forces to load and host a scenario of your choosing. This allows you to avoid separately launching VR-Forces from the start menu or command line, and automatically ensures that VR-Forces uses the same interoperability parameters as VR-Engage. A VR-Forces back-end license is always required to run VR-Forces, whether you launch it from the VR-Engage user interface, or launch it separately from the Start Menu or command line. If you do not have a VR-Forces back-end license available, VR-Engage will not allow you to launch VR-Forces and host a VR-Forces scenario.



When VR-Engage starts up, it looks for a running VR-Forces and if it finds one, it connects to it. If it does not find one, it offers you the option to host and load a VR-Forces scenario, or start an Unhosted session. If you host a VR-Forces scenario, you will consume a VR-Forces license, which will prevent you from starting VR-Forces independently if you only have one license. If you start an Unhosted session, you can start or join a session only as an individual player - you cannot load and run a scenario.

Network Compatibility

VR-Engage 1.5 is compliant with RPR FOM 1.0 and RPR FOM 2.0 and includes FOM mappers for many draft versions of the RPR FOM. It is compliant with RTIs that support the HLA 1.3 specification, the SISO DLC HLA API 1516 version of the IEEE 1516 specification (SISO-STD-004.1-2004), or HLA Evolved.

To use an RTI with VR-Engage, it must use the same operating system and be built with the same compiler.

VR-Engage 1.5 supports DIS 4, 5, 6, and 7, and can therefore interoperate with DIS applications of any of these versions.

New Features and Updates

This release of VR-Engage has the following updates and new features:

- ♦ Built against VR-Forces 4.8, VR-Vantage 2.6, and VR-Link 5.5.

Scenarios and Roles

- ♦ The default view is now the 3D View, not the Plan View.
- ♦ The Choose Role panel now indicates when human entities are controlled by another VR-Engage station. Unless you select the Spectator check box, a solider entity already engaged by another station is disabled for selection in this list.
- ♦ When the scenario is not running, the word “Paused” displays on the screen. Players cannot do anything while the scenario is paused. Please see Section 3.5, “[Entity Engagement and Scenario State](#),” in *VR-Engage Users Guide*.
- ♦ When player stations are connected to a scenario on VR-Forces or another instance of VR-Engage, a message displays on the player stations to inform the players that the session has ended and returns them to the Searching for Session dialog box.
- ♦ If you add or remove scenarios in the subdirectories, the scenario list now updates in real-time.

Human Characters

- ♦ Characters in VR-Engage now measure health and stamina, and they become less effective as they take more damage and become fatigued. See Section 5.4, [“Health and Stamina,”](#) in *VR-Engage Users Guide*.
 - All characters take more realistic damage. A shot in the leg is less lethal than a shot to the body.
 - Health and stamina bars indicate the player’s current status.
 - As fatigue increases and firepower health decreases, the aiming error increases.
 - As the aiming error increases, the size of the reticle increases.
 - As a player’s character takes damage, the screen shows some red. When the character is hit from the side, the corners of that side are highlighted in red. If the character is shot from the front or the back, all corners of the screen are highlighted. In addition, as a character’s health is depleted, the screen takes on a red tint.
- ♦ There is a new option in human entities’ Action menu, Reload, which currently resets all resources to full. Players can also reload weapons by pressing the **R** key.
- ♦ The scopes on M4 weapons have been improved.
- ♦ The AK-47 now fires in three-shot bursts (instead of single shots).
- ♦ Players controlling human characters can now press B on the Gamepad to talk on their radio. See Section 11.2, [“Gamepad Mappings for Human Control,”](#) in *VR-Engage Users Guide* to learn more about using the Gamepad.
- ♦ When players controlling human characters want to change their view between first and third person, they must now use the Action menu.
- ♦ Human entities can now climb up and down any ladders that exist in the terrain. Please see Section 5.2.5, [“Climbing Ladders,”](#) in *VR-Engage Users Guide*.
- ♦ Human entities can display a compass to help navigate the terrain. See Section 5.3.1, [“Using the Compass,”](#) in *VR-Engage Users Guide*.
- ♦ As you fire a weapon, the system keeps track of the amount of ammunition left in the magazine. When the magazine is depleted, the character pauses to reload. The weapon’s sysdef file defines the size of the magazine. See Section 5.5.7, [“Reloading a Weapon”](#).
- ♦ By default, the ammunition counts display in the human overlay, but you can hide it. For details, see Section 14.2.1, [“Ammunition Count Display”](#).
- ♦ There is now a minimap that allows you to see a 2D view of the entities in your area, with your character at the center. You can zoom this minimap. Please see Section 5.3.2, [“Using the Minimap,”](#) in *VR-Engage Users Guide*.
- ♦ The new Gesture option in human entities’ Action menu allows players to choose one of several gestures to perform. In IPB1, there are only a few simple gestures available: Wave, Point Right, Point Center, Point Left, and Come Here. Following IPB releases include more gestures. See Section 5.2.4, [“Gesturing and Signaling,”](#) in *VR-Engage Users Guide*.

- ♦ Lasing targets:
 - Soldiers that have lasing capability can specify a laser code. See Section 5.13.1, “[Defining the Laser Code](#)”, in *VR-Engage Users Guide*.
 - Those soldiers can also see the sensor view for gimbaled sensors in the scenario. See Section 5.13.2, “[Displaying a Gimbaled Sensor’s View](#)”.
- ♦ Aiming with Logitech Gamepads has been improved.

Aircraft and Sensor Operators

- ♦ There are new aircraft that you can control:
 - AH-64D Apache Longbow
 - AH-64E Apache Guardian
 - Eurofighter Typhoon

(The AH-64A Apache was retired.)
- ♦ Pilots of fixed-wing aircraft can now use the HOTAS Warthog controller to change the multi-function display pages. See Section 11.8.1, “[HOTAS Warthog Mappings for Fixed-Wing Entities](#),” in *VR-Engage Users Guide*.
- ♦ Aircraft with weapon systems display the weapon system counts on the left side of the HUD and a launch success zone on the right side. See Chapter 7, [Controlling Aircraft](#) to learn about the new HUD and how to use the new weapon systems.
- ♦ The VR-Forces GUI now shows the range rings for each aircraft’s selected weapon. This displays the weapon’s minimum, maximum, and optimal ranges.
- ♦ There are changes to the roles of two existing rotary-wing entities.
 - The CH-47 Chinook now has copilot and sling load operator roles, in addition to the pilot role. It no longer has a sensor operator role.
 - The UH-60 Blackhawk now has copilot and gunner roles, in addition to the pilot role. It no longer has a sensor operator role.
- ♦ Sensor operators can now lase a target, define a laser code, and use available weapons. See Section 9.1.6, “[Lasing Targets](#),” Section 9.1.5, “[Defining a Laser Code](#),” and Section 9.1.7, “[Firing Weapons](#),” in *VR-Engage Users Guide*.
- ♦ The Autopilot feature now includes a PATH option, which allows the player to have the aircraft follow a Route in the scenario. See Section 7.3, “[Using Autopilot](#),” in *VR-Engage Users Guide*.
- ♦ Pilots can now enter a bullseye, which is a point determined before a mission that allows them to report their position without revealing it to opposing forces. See Section 7.4, “[Setting a Bullseye Location](#),” in *VR-Engage Users Guide*.
- ♦ Rotary-wing entities cause rotor wash, realistically obscuring visibility ([Figure 1](#)). The rotor wash is dust, snow, or water, depending on the terrain. The intensity varies based on the entity’s altitude.



Figure 1. Rotor wash

Ground Vehicles

- ♦ Vortex vehicles can now collide realistically with non-Vortex vehicles. This is configurable. If a player is going to operate a weapon while the CGF drives the vehicle, you should set `enableNonVortexToVortexCollisions` in `./appData/scripts/vortexConfig.lua` to false.
- ♦ There are new ground vehicles that you can control:
 - M1120A4 HEMTT LHS
 - M1126 Stryker ICV with M2 ([Figure 2](#))
 - M1151 ECACs with M2, M240, M240B, and MK19 ([Figure 3](#))
 - M1A1 SA
 - M1A2 SEP Abrams
 - M2A3 Bradley IFV
 - M915 Tractor Truck
 - M977 HEMTT Cargo Truck
- ♦ The LAV, Stryker, and the M1A1 and M1A2 tanks allow you to stabilize the gun. See Section 6.3.3, “[Stabilizing a Vehicle’s Gun,](#)” in *VR-Engage Users Guide*.
- ♦ The Stryker and the M1151 models have interior geometry ([Figure 2](#) and [Figure 3](#)), allowing players to move inside the vehicle and select seats. Please see Section 5.7, “[Embarking on a Vehicle,](#)” and Section 5.7.1, “[Embarking on the Stryker as a Passenger or Commander,](#)” in *VR-Engage Users Guide*.
- ♦ These vehicles have been configured with the specified weapons:
 - M1A1 SA and M1A2 SEP Abrams: HEAT and Sabot rounds, 7.62 mm gun.
 - M2A3 Bradley IFV: 25mm M242 gun and 7.62 mm M240 gun.
- ♦ Sabot and HEAT rounds travel in an arc, not a straight line. The calculation includes the mass of the projectile, air resistance, and the drag coefficient. VR-Engage calculates for collisions in each frame, which can impact performance.



Figure 2. Stryker M1126 ICV with M2



Figure 3. M1151 ECAC with M240

Controls

- ♦ The keyboard and mouse controls for playable entities have been changed and expanded. See Section 11.1, “[Mouse and Keyboard Mappings](#),” in *VR-Engage Users Guide*. For soldier controls, you can also use the new *Keyboard and Mouse Controls* quick reference card, found in the Start menu and also at the end of *VR-Engage Users Guide* and *VR-Engage First Experience*.

- You can now replenish fuel and ordnance for fixed- and rotary-wing aircraft using controls on the HOTAS Warthog controller. See Section 11.8.1, [“HOTAS Warthog Mappings for Fixed-Wing Entities,”](#) and Section 11.8.2, [“HOTAS Warthog Mappings for Rotary-Wing Entities,”](#) in *VR-Engage Users Guide*.
- When using the 3 Screen display layout, you can use the DMS switch on the HOTAS Warthog controller to change MFD pages.
- You can disable the controls for moving the player’s eyepoint. See Section 14.1.3, [“Observer Controls,”](#) in *VR-Engage Users Guide*.

Installation

- The installation process now allows you to install SensorFX at the same time as VR-Engage, if you have a license for SensorFX.
- The *VR-ForcesVR-EngageAdd-ons.exe* installer is no longer included in the VR-Engage installation. It is a separate executable file.
- You can change the default installation directory by setting up a MAK_INSTALL_DIR environment variable. See [“Default Windows Installation Directory”](#) under Section 2.1.1, [“Installing the VR-Engage on Windows,”](#) in *VR-Engage Users Guide*.

Performance, Configuration, and Startup

- There are more command-line options available: DIS- and HLA-specific options, as well as `--dataDir`, `--userDataDir`, and `--enableSensorFX`. See Section 3.12, [“Command-Line Options,”](#) in *VR-Engage Users Guide* for a complete list and descriptions of the available command-line options.
- You can edit *playerStation.lua* to specify additional command line options. For more information, refer to Section 3.13, [“Command-Line Options for Player Stations,”](#) in *VR-Engage Users Guide*.
- By default, when the observer view is zoomed in, VR-Vantage now performs a screen intersection on the area the observer is looking at and improves the LOD at that area and not in other areas. To learn how to configure this feature, see Section 15.6.6, [“Configuring the LOD Center in the Observer Mode,”](#) in *VR-Vantage Users Guide*.
- VR-Engage now ships with the Tracy Client, which enables you to collect performance statistics in a file to send to our technical support team for help in tracking down problems. For details, see Section 5.2.4, [“Using the Tracy Client,”](#) in *VR-Vantage Users Guide*.
- VR-Engage has added support for high resolution displays. The user interface, including icons and text, stay visible on 4K monitors rather than becoming smaller at higher resolutions.

Documentation

Documentation has been updated for this release. The guides are provided as PDF files in the `./doc` directory. Online help is available from the VR-Engage Help menu. You can also find the most current PDFs at <https://www.mak.com/support/product-user-guides>.

Terrain and modeling information has been moved to the new *Adding Content to MAK Applications Reference Manual*. References direct you to relevant topics in that guide.

Fixed Bugs

VR-Engage 1.5 fixes the following problems that were present in previous releases:

- Fixed an issue that prevented users from taking control of a ground vehicle while it was performing a road driving task, such as Move to Waypoint (Plan Along Roads). 66151
- VR-Engage was not loading the visual definition files saved in the SMS UI folder. This is resolved. 66221
- In some cases, weapons were previously unable to reach their full range. This is fixed. 66530
- The minimap appeared cluttered with large icons and no ability to zoom. Icons are now smaller and users can zoom in or out of the map as described in Section 5.3.2, “[Using the Minimap](#),” in *VR-Engage Users Guide*. 66833
- Human entities were able to get too close to the side of the Stryker vehicle, appearing to sink into the side of the vehicle. The collision geometry for the vehicle has been updated to prevent humans from getting too close to the sides. 67037
- As a human driver role player, if you disembarked from a vehicle with the parking brake engaged, the brake would disengage when you disembarked. The parking brake now stays engaged after the driver disembarks. 67055
- Saving changes to munitions in VR-Engage SMS using the Simulation Object Editor could cause the SOE to close without saving. This is fixed. 67096
- Human role players now recover stamina (reduce fatigue) while walking. Previously, the player had to stop moving to recover. See Section 5.4.2, “[Experiencing Fatigue and Losing Stamina](#),” for details on stamina. 67225
- Humans now move faster when they crawl and run backwards. 67230, 67231
- Fixed issue where soldiers were able to throw grenades further than is humanly possible. They now throw grenades a reasonable distance. 67317
- The UH-60M Blackhawk has been configured with slots for human entities to embark on. The entities can be seen sitting in seats. 67358
- Improved communications between workstations. 67363
- While engaged as a human character in first-person view, transitions between postures are now faster. 67388

- ♦ New military human entities have a more reasonable default number of grenades: 4 fragmentation, 2 smoke, and 2 flash bang. Entities in existing scenarios will still have the old number of grenades. Simply replace them to see the new counts. 67425
 - ♦ The IMGui menu was unresponsive when adjusting the VR greenscreen parameters. This is fixed. 67563
 - ♦ M4 reload was too slow. 67710
 - ♦ Resolved issue where fixed wings were always destroyed on landing. 67878
 - ♦ Fixed an issue where a player occupying a human role on a vehicle would be left in an undetermined state (seemingly still in control of the vehicle) if the underlying human entity was deleted from the simulation. When a human character is deleted in this situation, VR-Engage now returns the player back to the Choose Role state. 68008
 - ♦ Fixed an issue in which a player's screen would go black upon the vehicle being destroyed. This issue only applied to the M1A2 driver role, 3D cockpit mode. 68012
 - ♦ Fixed an issue where a player exiting the driver role on the M1A2 would cause another player in gunner role on that vehicle to unexpectedly exit. 68016
 - ♦ Reduced the prone crawling speed to a more realistic maximum speed. 68128
 - ♦ If a player moved a human character into water and there was a splash, the player could hear the sound of an explosion. This is fixed. 68218
 - ♦ Changed two entity types to match the corresponding versions in EntityLevel SMS:
 - Israeli Soldier: 1:3:1:105:10:5:0:0 --> 1:3:1:105:1:0:0:0
 - Singaporean Soldier: 1:3:1:193:10:5:0:0 --> 1:3:1:193:1:0:0:0
- 68470
- ♦ There were areas in some terrains that VR-Engage controllable ground vehicles would fall through and go under the terrain. This is fixed. 68637
 - ♦ The RTD-specific fields in the Simulation Object Editor are now located on the Movement tab. VRE-1000
 - ♦ The flash from the barrel of the M1A2 SEP Abrams is now positioned correctly. VRE-1012
 - ♦ The zoom function on rotary- and fixed-wing entities' 2D moving map display is now smoother. 5302
 - ♦ Vehicles with detailed interiors have been configured to allow entities to sit in any available seat. 5520

Known Problems

VR-Engage has the following known problems:

- ♦ There are a few issues that require you to add the application name to the *BlackApps.dat*:
 - Under certain circumstances, opening VR-Engage on a second display prevents the program from starting.
 - In addition, launching from the main display and then moving the mouse cursor to the other monitor causes the program to freeze and not respond.
 - You might also experience crashes when trying to engage rotary- or fixed-wing aircraft.

If you experience any of these issues, edit the nahimic *BlackApps.dat* file and add the application name (for example, *vrengage.exe*) to the list. This file might be found in *C:\ProgramData\A-Volute\A-Volute.Nahimic\Modules\Scheduled\Configurator*, or *C:\ProgramData\A-Volute\A-Volute.28054DF1F58B4\Modules\ScheduledModules\Configurator*, or something similar. You can search *C:\ProgramData* for *BlackApps.dat* to locate it.

- ♦ When entering coordinates in the Input New Bullseye Coordinates dialog box, you cannot enter a minus sign using the keypad. You must use the minus sign on the main keyboard.
- ♦ Using Reset in Place on an entity inside of a building repositions the entity on the roof. If this happens and you have VR-Forces, use the VR-Forces GUI to reposition the entity back at ground level (or at the desired floor, in the case of multi-story structures).
- ♦ It is sometimes difficult to precisely position a remote camera on an entity. The camera may jump to a nearby spot, rather than attaching to the desired location on the entity. If this starts happening, the workaround is to place a different entity (human or other entity) in an arbitrary location on the terrain. Then return to the process of creating a new remote camera on the desired entity.
- ♦ If you are in a spectator role for a human entity and that entity embarks on a vehicle, the your viewpoint as a spectator will be frozen.
- ♦ If using the VIVE or VIVE Pro HMD, you must power on the device before starting VR-Engage. Failure to do so will lead to a situation in which HMD mode appears to be available as a display option in the Choose Role panel, but nothing will happen if you select that display option and then engage an entity. Always ensure that the VIVE is up and running before launching VR-Engage.
- ♦ You cannot take control of a VR-Engage-controllable human entity that is currently performing a DI-Guy animation task indefinitely.
- ♦ It is possible to unexpectedly walk off a helicopter you're embarked on by walking on the ramp while it is airborne (you will sink down and end up in mid-air if the helicopter is airborne. Reset the entity and start moving around again.

- ♦ If you task the fire_team unit to perform a move to location task, the unit will spread out into a fairly widely spaced formation. Doing this in a constricted area such as the warehouse area in Hawaii will lead to unexpected results, as the entities struggle to get into formation.
- ♦ Occasionally, when you return to "Choose Role" mode after flying an aircraft, the UI gets into an unexpected state. The HUD stays visible and the observer attachment controls do not work as expected. If this happens, the workaround to return to normal operation is to click on the Reset View button.
- ♦ Multiple players should not try to control the same vehicle or person in the same role. If multiple players take control of an entity in the same role, and then one of the players relinquishes control by returning to the Choose Role Panel, the remaining player also loses control of that entity. If this happens, the remaining player can regain control of the entity by going through the Choose Role process. Note that two players can concurrently control the same vehicle if they are in different roles (for example, one player is Driver, and the other is Gunner or Commander).
- ♦ SensorFX does not work with virtual reality devices.
- ♦ When two players are simultaneously controlling a LAV, one as driver and one as gunner, and the driver disembarks or changes role, the gunner's controls stop working. The workaround is for the player in the gunner role to press **ESC** twice in a row. This effectively causes the player to re-engage in the gunner role, thereby resetting the controls. A similar problem exists with the M1A2, with the same workaround.
- ♦ Streaming video with metadata does not currently work in the sensor operator role.
- ♦ The gimbaled sensor in both the pilot and sensor operator roles does not work correctly with SensorFX. The expected default sensor mode is IR, but the sensor currently shows a visual out-the-window mode.
- ♦ Articulated part smoothing does not work correctly with VR-Engage ground vehicles in this release. There are some visual anomalies when the vehicle starts moving. The workaround is to choose **Settings** → **Display Settings**, select the Entity Display Settings page, and then clear the Enable Articulated Part Smoothing check box.