VR-Engage 1.6 Release Notes

This release note provides release-specific information for VR-Engage 1.6.

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System Requirements

This section lists supported platforms and software requirements.

Platforms Supported

VR-Engage 1.6 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 1.6 is built against VR-Forces 4.9. If you intend to use VR-Engage with VR-Forces, you should install the data package that comes with VR-Engage into VR-Forces 4.9.

3D Video Cards Supported

VR-Engage 1.6 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.

Disk Space Requirements

A full installation of VR-Engage requires approximately 40 GB of disk space.

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.

HMD Support

VR-Engage 1.6 supports Oculus Rift CV1, HTC Vive, HTC Vive Pro, Varjo XR-1 and VR-2, and Windows Mixed Reality headsets. See Chapter 9, *Using Head Mounted Displays for Virtual Reality*, in *VR-Vantage Users Guide* to learn more.

Qt Compatibility

VR-Engage 1.6 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), 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 1.6 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 1.6 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 4.9, VR-Vantage 2.7, and VR-Link 5.6.

Data

- makData version 13 has a different structure from previous versions. As in previous releases, you must install the packages because they contain information that VR-Engage requires.

  The installation directory is also different from what it was in previous releases. See Section 2.2, "The VR-Engage Directory Structure," in *VR-Engage Users Guide*.

Aircraft

- There are two new aircraft available: Beechcraft MC-12 King Air and Beechcraft MC-12 King Air Single Seater.
- There is now an MR mask for the T-38C Talon.
- The HUD for aircraft now has a Flight Path Indicator and a Heading Indicator. For fixed-wing aircraft, the HUD now displays the Mach speed and information about selected targets. See Section 7.1.2, "The Head-Up Display," in *VR-Engage Users Guide*.
- The weapon and stores panel now accurately reflects the current munition and countermeasure counts, as well as the fuel. When you select a weapon, it is also indicated along with the launch success zone. See Section 7.1.3, "The Instrument Panel," in *VR-Engage Users Guide*.
- The radar indicator now allows pilots to adjust the range. Targets that are not within range blink. See Section 7.11, "Air-to-Air Combat," in *VR-Engage Users Guide*.

- The Radar Indicator in MFD window allows pilots to select either Track While Scan (TWS) or Range While Scan (RWS). Pilots can now select multiple targets for the air target list and the weapon automatically fires at the next-to-shoot (NTS) target. The radar multi-function display now shows the Track of Interest (TOI) Readout Line (ROL) for the selected target, while the HUD also displays information. See Section 7.11.1, "Selecting Targets," in *VR-Engage Users Guide*.
- When you select a target that was already selected, the radar switches to Single Track Target (STT) mode.
- Pilots now select a bullseye tactical graphic defined in the scenario rather than entering coordinates. See Section 7.4, "Selecting a Bullseye," in *VR-Engage Users Guide*.
- Pilots can now use button 7 on the HOTAS Warthog joystick to change the sensor mode. See Section 11.9.1, "HOTAS Warthog Mappings for Fixed-Wing Entities," and Section 11.9.2, "HOTAS Warthog Mappings for Rotary-Wing Entities," in *VR-Engage Users Guide*.
- The Visual Sensor Display for pilots and sensor operators now includes the laser code (LSR) and laser spot (LSS). See Section 7.10.2, "Targeting an Air-to-Ground Weapon Using a Laser Code," and Chapter 9, *Sensor Operator Role* in *VR-Engage Users Guide*.
- Pilots can now set the visual sensor to follow the currently selected target. See Section 7.11.3, "Focusing the Sensor on the Radar Target," in *VR-Engage Users Guide*.
- The Eurofighter Typhoon is now equipped with a Mauser BK-27 gun. Users can select and fire this weapon when embarked as the pilot.
- You can now configure joystick controllers to perform some tasks not included by default:
  - Deploy chaff or deploy flares using joystick input.
  - Cycle through selected targets or clear the target list using the HOTAS Warthog joystick by defining configurations for clear, cycle-back, and cycle-forward under Radar Scope.

  See Section 11.12, "Configuring Joysticks and Keyboard Control," in *VR-Engage Users Guide* to learn how to configure these and other settings for your controller.
- VR-Engage and VR-Forces now simulate external temperature and air pressure. This information is sent to RT Dynamics and affects movement for rotary-wing and fixed-wing aircraft.
- The autopilot setting for altitude and heading now also includes the ability to set the speed. The path autopilot setting also allows you to set the speed. See Section 7.3, "Using Autopilot," in *VR-Engage Users Guide*.

Ground Vehicles

- The following vehicles are now available:
  - GTK Boxer APC: Includes Driver, Gunner, Commander RWS, and Commander Hatch roles. The Gunner and Commander RWS are gunner roles for different guns.
  - M1A1 AIM (AUS) and M1A1 AIM (AUS) Mineplow: Include Driver, Gunner, Machine Gun (another gunner), Commander Views, and Commander Hatch roles.

  For a complete list of available entities and the associated roles, see Chapter 12, *Controllable Entities* in *VR-Engage Users Guide*.
- These vehicles have a 3D Interior display for specific roles: M1A1 AIM (AUS), M1A1 AIM (AUS) Mineplow, M1A2 Abrams MBT (Vortex), M1A2 SEP Abrams.

  These vehicles have a VR Headset display for specific roles: GTK Boxer APC LAV III APC (Vortex), M1A2 Abrams MBT (Vortex), M1A2 SEP Abrams.
- You can now enable gun stabilization on secondary machine guns. By default, this ability is enabled on the GTK Boxer APC, and it is also available on the M1A1 AIM (AUS) and M1A1 AIM (AUS) Mineplow. See Section 6.3.3, "Stabilizing a Vehicle's Gun," in *VR-Engage Users Guide*.
- You can now use the keyboard to control the M1A2 MBT Abrams and M1A2 SEP Abrams. See Section 11.1.2, "Ground Vehicle Controls," in *VR-Engage Users Guide*.
- The zoom levels for the tank gunner role are now 1, 2, 3, 6, 13, 25, 50, with corresponding overlays specific to the zoom level.

Human Characters

- There are now two Australian Soldier entities: EF88 and XM107.
- The compass now has two needles: the straight one indicates true north, and the arrow indicates magnetic north. Depending on where the observer is in the world, they can be close together or wide apart (Figure 1).

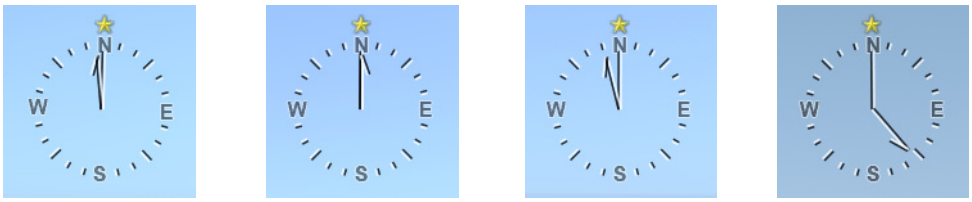

Figure-1. Compass

GUI

- In the MAK Radio standalone application, you can now use the **Settings** menu to choose the playback and capture devices. See Section 4.2.2, "Using the Standalone Radio Application," in *VR-Engage Users Guide*.

Lua Changes

- Lua messages now have a comment that describes the messages. The content of the comment field is added as comments to the generated header.

Configuration

- There is a new plug-in, vreSensorInfoManager. This plug-in allows VR-Engage aircraft entities to properly report radar contacts to the Sensor Information panel in the VR-Forces GUI.
- You can now load plug-ins using the VR-Forces Plug-Ins dialog box. See Section 3.14, "Managing Plug-ins," in *VR-Engage Users Guide*.
- When you install the VR-Engage plug-in on VR-Forces, the VR-Engage revision number is added to the VR-Forces About dialog box.

Third-Party Software and HUDs

- VR-Engage is now built against GL Studio 7.0 and supports HUDs built using GL Studio 7.0.

  HUDs built against GL Studio 5.x are no longer supported by VR-Engage.
- GL Studio HUDs now render after post processing effects such as HDR, SensorFX, and depth of field. This improves how the HUDs appear when these effects are active. Use the RenderAsOverlay parameter on the cockpit model definitions to have a cockpit use the old behavior.

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.

Fixed Bugs

Problems identified in previous releases have been fixed. For a summary, please see the *./doc/FixedDefectsVRE.csv* file.

Known Problems

VR-Engage has the following known problems:

- The Plug-ins Loaded page of the VR-Forces Plug-ins dialog box does not currently show the loaded sim engine plug-ins. Look at the *./bin64/vrfSim.log* file for a list of the loaded plug-ins. VRE-1316
- 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.
- 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, 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.
- Some features do not work in VR and have been disabled: compass, binoculars, minimap, NVG, and third person view.
- SensorFX does not work with virtual reality devices.
- You cannot take control of a VR-Engage-controllable human entity that is currently performing a DI-Guy animation task indefinitely.
- If you task the fire_team unit to perform a move to location task, the unit will spread out into a 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.

- 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).
- 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.