



VR-Forces 4.6.1 Release Notes

This release note contains the following release-specific information for VR-Forces Release 4.6.1:

Systems Supported.....	2
3D Video Cards Supported	2
Disk Space Requirements.....	3
Compiler Compatibility on Windows	3
Required Software for Toolkit Users	3
MAK Product Compatibility.....	4
License Manager	4
Third Party Library Support.....	4
Using MAK Products on Virtual Machines	4
Network Compatibility.....	5
Backwards Compatibility.....	5
RPR FOM Versions Supported	6
New Features and Updates	7
Simulation	7
Tasks and Sets	7
Terrain.....	8
Infrastructure.....	8
Documentation Updates.....	8
Fixed Bugs	9
Known Problems.....	10

Copyright © 2018 VT MAK, 150 Cambridge Park Drive, Third Floor, Cambridge, MA 02140 All rights reserved. VR-Exchange™, VR-TheWorld™, VR-Vantage™, DI-Guy™, and DI-Guy Scenario™ are trademarks of VT MAK. MAK Technologies®, VR-Forces®, RTIsPy®, B-HAVE®, and VR-Link® are registered trademarks of VT MAK.
Document ID: VRF-4.6.1-3-180725

Systems Supported

VR-Forces 4.6.1 is available for the platforms listed in [Table 1](#). For toolkit users, application code must be built with the indicated compilers in order to link to VR-Forces libraries.

Table 1: Platforms supported

Operating System	Compiler
Windows 7, Windows 8, Windows 10	Microsoft Visual C++ 12.0 (64 bit) Microsoft Visual C++ 15.0 (64 bit)
Red Hat Enterprise Linux 7 (64 bit libraries)	default compiler

3D Video Cards Supported

VR-Forces 4.6.1 supports NVIDIA graphics cards that support OpenGL 3.3 VR-Forces does not support AMD (formerly ATI) graphics hardware.



The recommended NVIDIA drivers for VR-Vantage 2.2 are those as close to 376.53 as possible, but no later. Drivers after that date have a minor memory leak issue when running Triton ocean with moving boats. This was a problem with drivers as recent as 378.78. This problem may be fixed in future versions of NVIDIA drivers, but it is safest to use the drivers nearest to 376.53.



VR-Forces strives to provide the best 3D scene quality possible and cutting edge visualization effects. To provide this functionality, VR-Forces 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-Forces to run in 3D modes.

OpenGL 3.3 is the minimum requirement for rendering a 3D scene in VR-Forces. For the best visual quality and highest performance you should use the most recent NVIDIA GeForce card.

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.

Using Kepler Series Quadro Cards

There is a known issue with the Quadro drivers on Kepler series Quadro cards. NVIDIA says its related to the fact that the default profile optimizes for a fixed eyepoint (for applications like CAD). To run on these cards, you must change the global profile for the driver, as follows:

1. Open the NVIDIA Control Panel.
2. Select the Manage 3D Settings page.
3. Select the Global Settings tab.
4. In the list of driver profiles, select Workstation App - Dynamic Streaming.

We are working with NVIDIA to have their drivers recognize our applications and apply this profile automatically. In the meantime, Kepler series Quadro you must make this change manually.

Disk Space Requirements

A full installation of VR-Forces requires approximately 15 GB of disk space.

Compiler Compatibility on Windows

MAK provides versions of product releases that have been compiled with different versions of Microsoft Visual C++ (for example, 12.0, and 15.0). When you run MAK products together on the same computer, for example, VR-Forces and VR-Vantage Stealth, we strongly recommend that you run versions compiled with the same compiler. Mixing products compiled with different versions of the compiler can result in program instability.

Required Software for Toolkit Users

If you plan to build VR-Forces applications using the VR-Forces Toolkit, you must download and install VR-Link 5.4. You can download it from:

- ♦ <ftp://ftp.mak.com/out/products/vrlink5.4-win64-vc12.exe>
- ♦ <ftp://ftp.mak.com/out/products/vrlink5.4-win64-vc14.exe>
- ♦ <ftp://ftp.mak.com/out/products/vrlink5.4-linux64-rhe7.tar.gz>

If you plan to build the VR-Forces GUI, you must download and install QT 5.10.1 (Windows) or 5.6.3 (Linux). You can download it at:
<http://www.mak.com/support/bonus-material>.

Qt is also available as a free download under the LGPL version 2.1 license at qt.digia.com. This version should be satisfactory for most VR-Forces customers. If you need a Qt commercial license, you must purchase the license from Digia.

MAK Product Compatibility

To build VR-Forces applications, you must link with VR-Link 5.4. If you are building for HLA and want to link with the MAK RTI, use MAK RTI 3.x or later, although we recommend use of the latest release. If you are building for HLA Evolved, you must use MAK RTI 4.0.4 or later.

License Manager

VR-Forces 4.6.1 uses FLEXlm 11.13.0.2.

The License Manager files are not part of the VR-Forces installer. You can download them at:

- Windows: <ftp://ftp.mak.com/out/MAKLicenseManager-win64-setup.exe>
- Linux: <ftp://ftp.mak.com/out/MAKLicenseManager-linux64-setup.tar.gz>

A license manager FAQ is available at:

<http://www.mak.com/license-support.html>

Third Party Library Support

VR-Forces 4.6.1 uses the indicated versions of the following libraries:

- VR-Link 5.4
- Qt 5.10.1 (VC 12 and VC 15), Qt 5.6.3 (Red Hat 7)
- OpenSceneGraph 3.4.0
- Boost 1.46.1
- FreeGlut 2.4.0
- GL-Studio 5.0.2 (VC 12), 5.1.2 (VC 15)
- DI-Guy 13.3 (development version)
- Triton 3.73
- Silverlining 5.005
- SpeedTree 6.3.2
- CDB API 2.2 (Windows), 2.1 (Linux)
- osgEarth 2.9.0
- CUDA 9.2 (Windows), 9.1 (Linux).

Using MAK Products on Virtual Machines

In general, MAK products run on virtual machines (VM) without any problems. The exception to this statement is that applications that use 3D graphics, such as VR-Vantage and the VR-Forces front-end, require a graphics card. Standard graphics cards typically do not work with VMs. To use a 3D enabled environment in a VM, please contact your VM vendor for options. NVidia produces the NVidia GRID card, which is designed to solve this problem. Your VM vendor may have additional information. For more information on NVidia GRID, please see <http://www.nvidia.com/object/virtual-gpus.html>

Network Compatibility

HLA only

VR-Forces 4.6.1 was built against VR-Link 5.4 and is compliant with:

- RPR-FOM 1.0 and 2.0.
- MAK RTI 3.x, 4.x, and other RTIs that meet the HLA 1.3, IEEE 1516 SISO DLC API, or HLA Evolved specifications and are built with the same compilers as VR-Forces.

VR-Forces 4.6.1 is compatible with applications that use earlier versions of VR-Link if they support versions of the RPR FOM listed.

DIS only

VR-Forces 4.6.1 supports DIS 4, 5, 6, and 7, and can therefore interoperate with DIS applications of any of these versions.

Backwards Compatibility

The VR-Forces 4.6.1 APIs are not compatible with VR-Forces 3.x or earlier. It is largely compatible with the 4.3.x API and later. Small changes may be necessary to migrate from 4.5.

Scenarios created with recent releases are usually forward compatible. However, changes to tasks, systems, and terrain reasoning may change how simulation objects behave.

Support for MAK Data Logger Recordings

The recordings provided with MAK Data Logger 5.4 or later use the new FED file naming conventions (Appendix E, *FED File Naming Conventions*, in *VR-Forces Users Guide*). These should work seamlessly with the default HLA configurations in VR-Forces 4.6.1. If you want to connect VR-Forces 4.6.1 to recordings made with previous versions of the Logger, you must change the connection configuration to use the old FOM naming convention.

RPR FOM Versions Supported

VR-Forces 4.6.1 has built-in support for versions 1.0 and 2.0 (drafts 6, 17, and 20) of the RPR FOM and RPR FOM 2.0, draft 17 with DI-Guy extensions. It also supports VR-Link's ability to support alternative FOMs through the FOM Mapper. By default, VR-Forces 4.6.1 uses RPR FOM 2.0.

If you are building an application with the VR-Forces toolkit and you want to specify a version of the RPR FOM through code, pass the version number (for example, 2.0006) to the *DtFedAmbWrapper* constructor and pass the resulting object to the *DtExerciseConn* constructor. Also, make sure you are using a federation execution name that corresponds to the right FED file. For example:

```
DtExerciseConn conn("VR-Link20006", "MyApp", new DtRprFomMapper(2.0006));
```

In order to support RPR FOM 1.0, we have added the following extensions (which are supported in later versions of the RPR FOM):

- ♦ EnvironmentProcess
- ♦ GriddedData
- ♦ EmbeddedSystem.IFF
- ♦ EmbeddedSystem.IFF.NatoIFF
- ♦ EmbeddedSystem.IFF.NatoIFF.NatoIFFTransponder
- ♦ EmbeddedSystem.IFF.NatoIFF.NatoIFFInterrogator
- ♦ EmbeddedSystem.IFF.SovietIFF
- ♦ EmbeddedSystem.IFF.SovietIFF.SovietIFFTransponder
- ♦ EmbeddedSystem.IFF.SovietIFF.SovietIFFInterrogator
- ♦ EmbeddedSystem.IFF.RRB
- ♦ BaseEntity.AggregateEntity
- ♦ ObjectRoot.BaseEntity.PhysicalEntity.Lifeform.

For both RPR FOM 1.0 and 2.0 VR-Forces 4.6.1 relies on the Controlling and ViewControl custom MAK extensions.

New Features and Updates

VR-Forces 4.6.1 has the following new features and updates.

- ♦ Support for Qt 5.10.1 (VC 12 and VC 15), Qt 5.6.3 (Red Hat 7). Qt 5.10.1 and 5.6.3 are binary compatible with Qt 5.5.1.

Simulation

- ♦ Support for modeling the effect of rain on radar sensors. For details, please see Section 75.1.8, “[Configuring the Effects of Rain on Radar](#),” in *VR-Forces Users Guide*.
- ♦ Support for changing some simulation parameters automatically during fast forwarding. For details, please see “[Changing Simulation Parameters when Increasing the Time Scale](#),” in *VR-Forces Users Guide*.
- ♦ Ability to specify detection probability for sensors. This allows sensors to be configured to either miss targets or randomly delay detection based on a specified probability. For details, please see Section 75.1.4, “[Specifying Sensor Detection Probabilities](#),” in *VR-Forces Users Guide*.
- ♦ Parachuting now works from fixed-wing aircraft and aircraft that do not have a detailed 3D geometry model. Previously this only worked from rotary-wing aircraft that had detailed models.

Tasks and Sets

- ♦ New sets:
 - Remote Sensor. Lets an entity that has a Remote Spot Report Receiver system receive the spot reports discovered by another entity. This set data request was included in VR-Forces 4.6, but was not documented.
 - A new Set command listed under **Set** → **Sensors** → **Sector Blanking** is present for all entities with radar sensors. The set command allows sector blanking to be enabled or disabled. If enabled, a start azimuth and end azimuth are entered. These values are relative to the entity orientation, with 0 degrees being directly ahead.

When sector blanking is enabled for a radar, no targets will be spotted if they are within that sector.

The sector blanking parameters are stored on a per-entity basis, and are saved into the scenario and checkpoint files.

For details, please see Section 35.63, “[Sector Blanking](#),” in *VR-Forces Users Guide*.

Terrain

- ♦ You can now display bounding volumes for nodes in the scene graph. For details, please see Section 63.8, “[Drawing Bounding Volumes for Scene Graph Nodes](#),” in *VR-Forces Users Guide*.
- ♦ Contour lines are no longer supported.
- ♦ In Plan View observer mode, you can display a map scale on the terrain. For details, please see Section 54.9.1, “[The Map Scale Overlay](#),” in *VR-Forces Users Guide*.
- ♦ You can now specify a height and depth value in `./appData/settings/vrfSim/navigationProfiles.mtl` for use when calculating navigation areas.
- ♦ The medfTool (Section 89.11, “[Compressing Model Files](#),” in *VR-Forces Users Guide*) has two new options:
 - `--scaleLod`. Scale the switch in/out distance of all the children under an `osg::LOD` node with the provided value.
 - `--removeHighestLod` Removes the highest LOD node under a group if it has more than one LOD.

Infrastructure

- ♦ Audio is now supported on Linux.
- ♦ You can now hide the mouse in full screen mode. For details, please see Section 82.4.1, “[Hiding the Mouse in Full Screen Mode](#),” in *VR-Forces Users Guide*.
- ♦ VR-Forces no longer supports view controls from the Stealth View Control Toolkit (MAK Stealth 6.2 and earlier). This change may affect old MAK Data Logger recordings.

Documentation Updates

VR-Forces Users Guide and online help have been updated for this release.

Fixed Bugs

The following problems identified in previous releases have been fixed:

- ♦ The `getAttribute` functions on the system attributes to get the IFF mode status would always return true, even when the mode is off. 63435
- ♦ Hebrew translation did not work. 63381
- ♦ The Task and Set menus were disabled when using remote attachment. 63369
- ♦ Fixed a problem with changing lanes in the road driving algorithm. 63140
- ♦ The bank angle of fixed-wing aircraft now corresponds to their speed and turn rate.
- ♦ Fixed a possible crash when an automatic checkpoint and a manual save happened at the same time.
- ♦ Fixed a crash that happened when previewing a scripted task dialog box that used a DI-Guy appearance parameter.
- ♦ Copying and pasting plans that contained conditional statements produced altered plans.
- ♦ Fixed a crash in the Launcher Actuator in the case where the descriptor was not specified.
- ♦ Fixed a crash that could occur in Linux under specific circumstances when firing a missile.
- ♦ Fixed a GUI crash that could occur in the terrain profile graph of a moving entity.
- ♦ Fixed a GUI crash when using the escape key to discard changes from the color chooser dialog.
- ♦ The Issue Plan command can now be used to reliably issue a plan to an entity created in the same plan. Previously this could fail if the entity creation was delayed due to paging of terrain. 63418
- ♦ Lua functions returning IFF mode status now return the correct values.
- ♦ Fixed issue in the Edit dialog box for objects where altitude was interpreted as meters, even if display units were set to feet.
- ♦ Fixed issue where Laser Guided Missile Launcher could launch missiles when a target was outside of the target cone.
- ♦ Editing a task in a plan that had been pasted could alter the original task.
- ♦ Sometimes sensors would not advance the CID level for entities that were spotted at a far distance and then came closer to the sensor.
- ♦ On Linux, the Simulation Object Editor sometimes crashed on close. 63012
- ♦ When running faster than real time, the CPU was not used correctly. 63161
- ♦ Fixed a problem with dead reckoning of embarked DI-Guys. 63226
- ♦ The `--frameRate` command line option did not work. 63410
- ♦ Setting 2D icons in the Visual Models Editor did not work. 63202
- ♦ Images were cached using relative paths instead of absolute paths. This could cause the wrong texture to be used. 63454
- ♦ Changing the frustum could cause a crash. 63099

- ♦ Zooming in from far away did not change the LOD that is used for the imagery when using the REX engine. 63452
- ♦ The Medftool did not provide any easy way to debug crashes. 63051
- ♦ Notional models did not work well on Ala Moana.mtf. 62987
- ♦ JRM libraries required the VC 10 redistributable. 63091
- ♦ The first model of a particular type added to the scene caused alpha to coverage to mess up and then the shadow poly or windows allowed for seeing through the terrain. 63201
- ♦ DtOsgRenderer assumed the viewer.getView(0)->getDatabasePager() would be non-null. It now loops over the views to find the first one with a non null pager instead of assuming the pager is valid. 63538

Known Problems

- ♦ Feature indexing for model layers in osgEarth terrains is not supported by VR-Vantage applications and must be disabled on all model layers to avoid performance issues and the possibility of crashes:

```
<model>
  <feature_indexing enabled="false"/> <!-- include this with every model
    section for VR-Vantage. If enabled, feature_indexing causes performance
    issues and crashes on Linux -->
  <!-- rest of model layer setup here-->
</model>
```