



VR-Forces 4.3.1 Release Notes

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Systems Supported

VR-Forces 4.3.1 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 Vista, Windows 7, Windows 8	Microsoft Visual C++ 10.0 SP 1 (32 bit and 64 bit)
Red Hat Enterprise Linux 6 (64 bit libraries)	default compiler

3D Video Cards Supported

VR-Forces 4.3.1 supports NVIDIA graphics cards that support OpenGL 3.3 VR-Forces does not support AMD (formerly ATI) graphics hardware.



You must use NVidia driver 340.29 or later.



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.

Disk Space Requirements

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

Compiler Compatibility on Windows

MÄK provides versions of product releases that have been compiled with different versions of Microsoft Visual C++ (for example, 10.0 and 11.0). When you run MÄK 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 5.1.3. You can download it from:

- ♦ <ftp://ftp.mak.com/out/products/vrlink5.1.3-win-vc10.exe>
- ♦ <ftp://ftp.mak.com/out/products/vrlink5.1.3-linux-rh6.tar.gz>

If you plan to build the VR-Forces GUI, you must download and install QT 4.7.4. You can download it at: <http://www.mak.com/support/resources/bonus-material.html>

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.

MÄK Product Compatibility

To build VR-Forces applications, you must link with VR-Link 5.1.2. If you are building for HLA and want to link with the MÄK RTI, use MÄK RTI 3.x or later, although we recommend use of the latest release. If you are building for HLA Evolved, you must use MÄK RTI 4.0.4 or later.

License Manager

VR-Forces 4.3.1 uses FLEXlm 11.13.0.2.



You must update your License Manager software for this release. You can continue to use old licenses if maintenance is up to date.

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

- ♦ Windows:
<ftp://ftp.mak.com/out/MAKLicenseManager-win-setup.exe> (for 32-bit systems)
<ftp://ftp.mak.com/out/MAKLicenseManager-win64-setup.exe>
- ♦ Linux:
<ftp://ftp.mak.com/out/MAKLicenseManager-linux-setup.tar.gz> (for 32-bit systems)
<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 4.3.1 uses the indicated versions of the following libraries:

- ♦ VR-Link 5.1.3
- ♦ Qt 4.7.4
- ♦ OpenSceneGraph 3.1.4
- ♦ Boost 1.46.1
- ♦ FreeGlut 2.4.0
- ♦ GL-Studio 4.2.3
- ♦ DI-Guy 13.0.1
- ♦ Triton 3.10
- ♦ Silverlining 3.040
- ♦ SpeedTree 6.3.2
- ♦ osgEarth 2.6_rev150902.

MÄK will provide modified source code for OSG and osgEarth upon request, as per the OSGPL license. Please contact support@mak.com for download links.

Running the 32-bit Version of VR-Forces

While VR-Forces is supported on 32-bit operating systems and processors, it is not recommended. Modern applications like VR-Forces take advantage of large pools of memory to load complicated and beautiful content. Using a 32-bit operating system or machine, will mean some content may not be available, and VR-Forces may perform worse than with a 64-bit environment.

Using MÄK Products on Virtual Machines

In general, MÄK products run on virtual machines 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 4.3.1 was built against VR-Link 5.1.2 and is compliant with:

- RPR-FOM 1.0 and a subset of 2.0 (draft 6, 17, and 20).
- MÄK 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 4.3.1 is compatible with applications that use earlier versions of VR-Link if they support versions of the RPR FOM listed.

The VR-Forces 4.3.1 front-end is not compatible with RTI-NG Pro because it uses a non-standard version of *xerces_c_2_7.dll*.

DIS only

VR-Forces 4.3.1 supports DIS 4, 5, 6, and 7, and can therefore interoperate with DIS applications of any of these versions.

Backwards Compatibility

The VR-Forces 4.3.1 APIs are not compatible with VR-Forces 3.x or earlier. It is largely compatible with the 4.2.x API. Small changes may be necessary to migrate from 4.2.

Scenarios created with VR-Forces 3.12 and 4.x are forward compatible.

RPR FOM Versions Supported

VR-Forces 4.3.1 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 4.3.1 uses RPR FOM 1.0.

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 *DtRprFomMapper* 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 4.3.1 relies on the LgrControl and View-Control custom MÄK extensions.

New Features and Updates

VR-Forces 4.3.1 has the following new features and updates.

Simulation Changes

- ♦ *DtOsgModelInstanceSignaler* is now *DtModelSignaler*.
- ♦ Set Current Speed set data request. This set data request sets an entity's speed without regard to environmental constraints or entity parameters such as maximum speed. The entity will move at whatever speed you set.
- ♦ A new environment variable, `VRV_GL_DEBUG`, enables the OpenGL debug callback and sends messages to the console.
- ♦ Improved performance in Plan View observer mode. Many other performance improvements.
- ♦ Added a new demonstration scenario - FlightDeckOps, in the CarrierDemo directory. In this scenario, the aircraft carrier is part of the terrain, rather than being a simulated entity. Helicopters and jets take off from the carrier deck and then land back on it. This scenario makes extensive use of global plans and issuing plans to entities from within another plan.

Visualization Changes

- ♦ Changes to render settings:
 - Settings on the Render Settings page related to visualizing ocean have been moved to a new Ocean Render Settings page.
 - Settings that affect lighting have been moved to a new Lighting Render Settings page. The Enable Advanced Lighting and Shading setting is now called Enable Lighting.
 - The Visualize Mode option has been renamed Component Visualization.
 - You can now set the LOD scale, texture height, and texture width for ocean planar reflections. For details, please see Section 17.3.1, “[Configuring Ocean Planar Reflections](#),” in *VR-Forces Users Guide*.
 - A new setting, Colorize Per Drawable has been added to the Render Settings page. For details, please see Section 1.10, “[Coloring Draw Calls](#),” in *VR-Forces Users Guide*.
- ♦ The Experimental Ocean Settings dialog box has been renamed Experimental Features. The Paged LOD Magnification Scale Factor setting has been moved to this page from the Render Settings page.
- ♦ You can now set an LOD distance for buoyancy models for surface vehicles. For details, please see Section 8.20, “[Enabling Buoyancy for Surface Entities](#),” in *VR-Forces Users Guide*.

- ♦ The Sensors page has added a new option – Monochrome Mode. New sensor modes have been added – Visual Camera (which is full color) and Monochrome Camera.
- ♦ The list of observer modes has been updated. Inset observer mode was removed. The Out-the-Window observer modes that includes CameraFX sensors have been renamed IR (CameraFX), IR Blackhot (CameraFX), and NVG (CameraFX). A new observer mode has been added – Visual Camera (CameraFX). The new mode uses the new Visual Camera sensor mode.
- ♦ Enabling and disabling view controls is now a global setting rather than being observer-specific. Therefore it has been removed from the Observer Settings page, the Observer Control Panel, and the Observer Settings Toolbar. You now enable or disable view controls on the Settings menu and the Display Settings Toolbar. You can override the GUI settings on a per-connection basis. For details, please see Section 11.12, “[Controlling the Observer from Other Applications](#),” in *VR-Forces Users Guide*.
- ♦ VR-Forces can smoothly transition between saved observer views instead of jumping immediately to the selected view. For details, please see “[Animating Transitions Between Observer Views](#),” on page 11-30 in *VR-Forces Users Guide*.
- ♦ New speed scaling modes for observer movement. You can specify that VR-Forces base speed scaling on altitude above sea level or altitude above ground level. For more information, please see “[Setting the Speed Scaling Mode](#),” on page 11-26 in *VR-Forces Users Guide*.
- ♦ Lighting is now managed as follows:
 - Light points that are part of the terrain, such as runway lights, automatically turn on at dusk and turn off at dawn.
 - Vehicle lights and buoy lights are always on.
 - Dynamic lights that are part of the terrain, such as street lights automatically turn on at dusk and turn off at dawn.
- ♦ Flashlight mode aims a beam of light on the scene. For details, please see Section 17.8, “[Flashlight Mode](#),” in *VR-Forces Users Guide*.
- ♦ You can now set a global value for ambient material values and diffuse material values. For details, please see Section 17.6.2, “[Configuring the Material Ambient and Diffuse Values](#),” in *VR-Forces Users Guide*.
- ♦ You can now configure randomization of SpeedTree height and orientation. For details, please see Section 17.11.1, “[Randomizing the Size of SpeedTrees](#),” in *VR-Forces Configuration Guide*.
- ♦ Instrument panels. Instrument panels are individual cockpit instrument displays that you can arrange on the screen. By contrast, cockpit displays are fixed displays that take up the entire screen. For details, please see Section 8.16, “[Displaying Instrument Panels](#),” in *VR-Forces Users Guide*.
- ♦ Inset views now list the entity for which they were created in the title bar. However, if you change the view in the window to look at other entities, the title does not change.

- You must use NVidia driver 340.29 or later.
- Use of the cache element in earth files to change the location for caching terrain data is no longer recommended. Use the OSGEARTH_CACHE_PATH environment variable. For more information, please see Section 13.9.1, “[Caching Terrain Server Data](#),” in *VR-Forces Configuration Guide*.

Processing Streamed Data

VR-Forces has several “processors” that search through streamed-in data looking for things like SpeedTrees, objects that need effects textures attached, buoys, beacons, and so on. In previous versions of VR-Forces, all of these different processors would look through everything that streamed in. So, for example, the SpeedTree code looked through the point buildings looking for SpeedTrees, and the point building processor looked through SpeedTrees.

We have changed this so that the processors register feature names that they want to process. The registration data is in `.importConfig/registrant_feature_list.csv`. For example, in `registrant_feature_list.csv`, it states that SpeedTrees must use the `feature_custom` driver and the processor for SpeedTrees, `speedTreeManager`, is mapped to `Vegetation`. In *VR-TheWorld Online - MAK Earth.earth*, SpeedTrees are configured as follows:

```
<model name="trees" driver="feature_custom">
  <features name="Vegetation" driver="wfs">
```

The driver is `feature_custom` and the feature name is `Vegetation`. This means that it will be processed by the `speedTreeManager`.

Similarly, the `featureDataBroker`, which is responsible for creating streamed buoys, beacons, and the lights and marks that might be attached to them, must use the `feature_custom` driver and is mapped to `57-data` and `dynamicFeatures`. (Processors can be mapped to more than one layer type.) Examples of using this processor are:

```
<model name="LateralBuoysUS5HA52M" driver="feature_custom"
  enabled="true">
  <features name="s57-data" driver="ogr">
```

and

```
<model name="TaxiwayLights" driver="feature_custom">
  <features name="dynamicFeatures" driver="ogr">
```

`registrant_feature_list.csv` file is fully commented and provides additional information about this scheme.

We have updated earth files to use the new scheme. If you are using custom earth files, you must update them to take advantage of this new processing method. If you use VR-TheWorld Server, you must update your earth files (or your `registrant_feature_list.csv` files).

Documentation Updates

Documentation has been updated for this release.



The video tutorials for terrain composition and model creation distributed with VR-Forces were created using VR-Vantage. Although there are obvious differences in the overall GUI, the menu options and procedures for these activities are the same in VR-Forces as in VR-Vantage. The Breaching Scenario and Creating Conditional Expression videos were created using VR-Forces 4.2. Again, although there are some changes in the GUI, these procedures have not changed.

Fixed Bugs

The following problems identified in previous releases have been fixed:

- *VR-Forces Users Guide* had the incorrect capitalization for the `--autoConnect` command-line option.
- The back-end crashed if you changed environmental settings without loading a scenario. 55131
- The pan speed for the observer was too slow. 55047
- The visual sensor was removed from aircraft to improve performance. 54982
- Ballistic missiles run from CSV files flooded the network with packets. 54973
- The support points and bounding volume for the P-3 aircraft were incorrect. 54973
- Boxes did not edit correctly on geocentric terrains. 54931
- Helicopter embarkation on the Arleigh Burke destroyer did not work well. 54926
- The Hawaii terrain in VR-TheWorld Server did not run correctly with cached data. 54908
- Tactical smoke moved opposite to the wind direction. 54874
- Bouyancy did not work. 54859
- Tasks with the Use Roads setting did not always initialize correctly when a scenario loaded. 55428
- The Move Along command for fixed-wing entities did not take into account the `at-time` parameter when flying. 55418
- Move Into Formation did not work. 55368
- Setting the location of non-VR-Forces entities by dragging caused the front-end to crash. 55329
- Layout of the Set Altitude dialog box was improved. 55287
- The setting for the Show Object Console warning icon was not saved. 55258

- ♦ When you set a rotary wing entity to destroyed, it did not fall from the sky, it immediately clamped to the ground. 55255, 55254
- ♦ The Type 23 Frigate had incorrect bounding volume and supports points. 55253
- ♦ The Detect Entity condition did not work. 55250
- ♦ The Reactive Task dialog box had some visual anomalies. 55125
- ♦ The back-end crashed when creating computed routes on the Bakersfield terrain. 55117
- ♦ Editing points of routes did not work correctly. 55115
- ♦ VR-Forces paged in terrain when creating entities, which led to slow creation times. 55107
- ♦ Ground clamping by the aggregate movement actuator did not always work. 55088
- ♦ The terrainToolkit header *tdbutill/translations.h* did not get renamed correctly. 55027
- ♦ Fixed a variety of problems that affected performance. 54996
- ♦ The features system used too much memory. 54980
- ♦ If you loaded a scenario that used the same terrain as the currently open scenario, VR-Forces unloaded the terrain and reloaded it rather than keeping the terrain loaded. 54978
- ♦ When a scenario is paused, the dead-reckoning algorithm is now set to static. 54977
- ♦ The starting scenario time was different depending on whether the front-end or back-end loaded first. 54956
- ♦ It was not possible to add systems to entity-level aggregates in the Entity Editor. 54953
- ♦ When you created a scripted movement object using a missile target, it always creates an opposing force scripted object, regardless of the force of the target object. 54950
- ♦ Waypoints had incorrect orientation during creation in geocentric terrains. 54925
- ♦ The Linux distribution did not include the source files for the examples. 54911

