



VR-Forces 4.1 Release Notes

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Systems Supported

VR-Forces 4.1 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 XP (32 bit only) Windows Vista Windows 7	Microsoft Visual C++ 8.0, 10.0 (64 bit)
Red Hat Enterprise Linux 5 (32 bit libraries)	default compiler

Future Platform Support Plans

VR-Forces will drop support for VC++ 8 in late 2013.

3D Video Cards Supported

VR-Forces 4.1 supports NVIDIA graphics cards that support OpenGL 2.0. VR-Forces does not support AMD (formerly ATI) graphics hardware.



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 eight 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, 8.0 and 10.0). 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.

MÄK Product Compatibility

To build VR-Forces applications, you must link with VR-Link 4.0.5. 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.

Qt Release Compatibility

If you want to do development using the VR-Forces GUI API, you need to use Qt, a cross-platform GUI toolkit from Digia. The VR-Forces GUI was built with Qt release 4.7.4. Qt is 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.

FLEXlm Support

VR-Forces 4.1 uses FLEXlm 11.8. If you have a previous version of FLEXlm installed, you can install the MÄK License Manager and run FLEXlm from that directory, or you can copy the files installed by MÄK License Manager to your previous FLEXlm directory on your license server. You do not need to change license files (unless your maintenance agreement has expired.)

Third Party Library Support

VR-Forces 4.1 uses the indicated versions of the following libraries:

- ♦ VR-Link 4.0.5.
- ♦ OpenSceneGraph 3.0.1.
- ♦ Boost 1.45.
- ♦ FreeGlut 2.4.0.
- ♦ DI-Guy 11.0.3 (animations file is from 10.0).
- ♦ GL-Studio 4.2.3.

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.

VR-Forces 32-bit Does Not Support Some Large Terrain Databases

The 32-bit versions of VR-Forces cannot support large terrain databases whose use results in exceeding the memory capabilities of 32-bit applications and operating systems. For example, the 32-bit versions of VR-Forces cannot run scenarios that use the *VR-TheWorldOnline - MAK Earth.mtf* terrain, which has a highly detailed terrain of Honolulu, Hawaii.

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, may not work properly. This is due to lack of support for NVIDIA drivers by virtual machines. We continue to investigate ways to resolve this problem.

Network Compatibility

HLA only

VR-Forces 4.1 was built against VR-Link 4.0.5 and is compliant with:

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

The VR-Forces 4.1 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 4.1 supports DIS 4, 5, and 6, and can therefore interoperate with DIS applications of any of these versions.

Backwards Compatibility

The VR-Forces 4.1 APIs are not compatible with VR-Forces 3.x or earlier. It is largely compatible with the 4.0.x API. Small changes may be necessary to migrate from 4.0.4.

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

RPR FOM Versions Supported

VR-Forces 4.1 has built-in support for versions 1.0 and 2.0 (draft 6 and 17) 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 4.1 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 4.1 relies on the LgrControl and View-Control custom MÄK extensions.

New Features and Updates

VR-Forces 4.1 has the following new features and updates.

- Scripted tasks. You can now add new tasks to the Task menu by writing scripts using the Lua language. For more information, please see [Scripted Tasks](#), on page 7. For complete details, please see Chapter 12, [Creating Scripted Tasks](#), in *VR-Forces Scenario Management Guide*.
- Streaming features. VR-Forces entities recognize features streamed in from VR-TheWorld and react to their presence. For example, entities will not drive through buildings.
- Tactical graphics. Support for the full set of tactical graphics (overlay graphics) that were supported in VR-Forces 3.12. Tactical graphics can be added and edited in the Entity Editor. You can specify that a tactical graphic not be published. For details, please see Chapter 5, [Overlays and Tactical Graphics](#), in *VR-Forces Scenario Management Guide* and [Section 4.11, "Editing Tactical Graphics"](#), in *VR-Forces Configuration Guide*.
- Audio. VR-Forces can play wave files associated with the entities in a scenario. For details, please see Chapter 15, [Sound Effects](#), in *VR-Forces Users Guide*.
- Sensor effects (Windows only). VR-Forces can alter the 3D display to make it look as if it was viewed through night vision goggles (NVG) or infrared (IR). For details, please see Chapter 16, [Using Sensors](#), in *VR-Forces Users Guide*.
- Changes to road movement and Move To tasks. For details, please see [Changes to Move To Tasks and Road Movement](#), on page 8.
- Changes to the Create menu and object creation palettes. For more information, please see [Changes to the Entity Palette and Create Menu](#), on page 7.
- MSDL. Ability to import and export Military Scenario Description Language (MSDL) files. For details, please see [Section 1.1.3, "Importing and Exporting MSDL"](#), in *VR-Forces Scenario Management Guide*.
- Support for ballistic munitions. A new artillery model has been added which will simulate and fly out artillery shells as separate entities. The trajectory of the entities is not affected by the wind or by friction.

The default for all the artillery weapons systems is to use the new behavior, but the old behavior can still be restored by changing the simulate-munition flag to false in the indirect-fire-actuator. The old behavior does not simulate or publish the trajectory, just a fire and a detonate event. Since publishing the munitions will require more CPU power and bandwidth it might be advisable to disable it for large simulations.

- Aircraft can now drop bombs. New munitions have been added and a Release Bomb task.
- A new M252 mortar has been added to the ground entity menu. It is simulated as a self-propelled weapon because there is currently no model of the crew which moves and operates the weapon. It can be tasked to move and fire for effect like the M109 Howitzer.

- ♦ VR-Forces has added a variety of entity types across the different platforms. Some entity types do not have 3D models. In such cases, the entity name on the Create menu includes “(no 3D)”.
- ♦ Display of emitter information in the Entity Information dialog box.
- ♦ API. Task types now use a string instead of an int.
- ♦ Disabling acceptance of view control messages now disables acceptance of view controls for global settings, not just for the observer mode that has disabled view controls.
- ♦ The VR-Vantage View Control Toolkit has added many new view controls and changed some of the details of how view control messages are sent. Please see [API Changes](#), on page 9 for details.
- ♦ In dialog boxes with multiple selection lists, you can now choose which list is active for making selections by clicking in the display window. For details, please see [Section 6.1.4, “Specifying Parameters for Tasks”](#), in *VR-Forces Scenario Management Guide*.

Scripted Tasks

In prior releases, the only way to add a new entity task was to use the VR-Forces Toolkit. This required knowledge of C++, a developers license, and a development environment. The new scripted task feature lets you create complex entity behaviors, based on the existing C++ tasks, using the Lua scripting language. While programming skills are required, the Lua language is much more “accessible” than C++. You do not need a developers license or development environment. You just use the built-in Lua classes and functions. Scripted tasks are automatically added to the Task menu and are available for entities to use just like the built-in C++ tasks.

Changes to the Entity Palette and Create Menu

The Entity Palette no longer organizes entities by force. All entities are available to be created by all forces. This simplifies scenario creation because, for example, an M1A2 may be a friendly force entity for VR-Forces users in one country, but an opposing force entity in another country.

Entities are listed in the Entity Palette with their country code. This is the country in which the entity is manufactured, not necessarily the country that is using it.

When you create an entity you select the force for which you want to create it. As in previous versions of VR-Forces, you can change an entity’s force after you create it.

The Create menu no longer lists all available entities or tactical graphics. It only lists entities and tactical graphics that you have designated as “Favorites”. By designating the entities that you most often use, you can streamline the entity creation process because you will not have to scroll through long lists of entities to find the one that you want to create.

As part of this change, when you edit an entity in the Entity Editor, you no longer assign it to a force. However, you can now specify that it be a favorite.

It is no longer possible to manually configure the Create menu in the Entity Editor, except by designating objects as favorites. The *vrf.ent* file has been removed.

Changes to Move To Tasks and Road Movement

The option on the Move to Waypoint and Move to Location tasks to “Use Roads” has been removed. VR-Forces now has three types of Move To tasks:

- ♦ Move To Location (Direct) and Move To Waypoint (Direct). Entities move directly to the destination without taking into account road networks.
- ♦ Move To Location (On Roads) and Move To Waypoint (On Roads). Entities move along road networks to the closest point on the network to the destination. They do not leave the road network, nor do they drive to it. They must be within 10 meters of the network at the start of the task or it fails.
- ♦ Move To Location (Plan Path) and Move To Waypoint (Plan Path). Combines direct movement and movement on roads if a network is available. This task is similar in concept to the old option to “Use Roads”, but may not always produce the same results.

For backwards compatibility with legacy scenarios, VR-Forces will try to substitute Move To (Plan Path) for tasks in plans that specify to Use Roads.

Due to changes to road movement, the Set Stay in Lane set data request is no longer relevant and has been removed.

If you task an entity to Move Along Route, with Treat Route as Road, the task behaves similarly to Move To Location (On Roads). The entity must be within 10 meters of the route or the task will fail.

For more information, please see [Section 6.3, “Entity Movement On Roads and Off Roads”](#) and specific task descriptions in *VR-Forces Scenario Management Guide*.

API Changes

VR-Forces has the following changes to its APIs. For occasional updates to migration information, please check <http://www.mak.com/support/migration-support.html>.

- ♦ Tasks, Sets and Reports now use a string as a type identifier instead of an integer.
- ♦ Simulation engine:
 - The simulation engine now supports streaming and paging of feature data. The API has been updated to add this support. (For details, please see section 15.6 in VR-Forces Developers Guide.)
 - *DtSimComponent* now has a virtual `preFirstTickInit()` method, called before the first call to `tick()`
- ♦ GUI:
 - The *DtNetworkMessageCallbackManager* class was renamed to *DtGuiThreadNetworkCallbackManager*.
 - For attributes and capabilities settings, the *attributes.mtl* and *capabilities.mtl* files are no longer used. The values are read from the SISO *.xml* file. All items should now be SISO compliant.
 - *dis-entity-types.csv* is no longer used in the Entity Editor or //front-end for selecting entity types. The SISO *.xml* file is now used.
 - Many GUI elements are now available to create via the *DtVrfTaskSetVariableWidgetManager*. Any parameter that is added to a scripted task is created using this factory. The list of GUI elements that can be created are in *vrfScriptedTasks.h*
 - Task, Set and Create menu configuration is now initially set from configurations found in the *DtVrfSimulationManager*. The `menuManipulation` example has been modified to show the new usage.

The VR-Vantage Control Toolkit has the following changes:

- ♦ View control messages are sent using *DtDataInteractions*. *DtDataInteractions* provide a `receiverId` field. The `receiverId`'s `siteId` and `applicationId` are now used when processing view control messages. If these match the `siteId` and `applicationId` of the connection receiving the message, the message is processed. The message is also processed if `siteId` and `applicationId` are both -1's (wildcards). For backwards compatibility, `siteId/applicationId` of 0/0 is also processed.
- ♦ Some view control messages control observer-specific settings. These messages now let you specify the name of an observer mode to modify. If no observer mode is specified, then these commands affect all observer modes currently in use. If an observer mode is specified, then only that observer mode is affected.

Documentation Updates

Documentation has been updated for this release. *VR-Forces Developers Guide* and *VR-Forces Front-End Developers Guide* are no longer provided in PDF format. They are now part of the HTML API documentation.

Note the following updates to documentation:

- ♦ In previous releases, VR-Forces documentation has referred to the display of electromagnetic emissions as “sensor volumes”. This terminology was incorrect. This display is now called an emitter volume.
- ♦ For past releases, a set of video tutorials for VR-Forces was available on the MÄK web site. These tutorials are now included with the VR-Forces documentation. You can view them by running `./doc/vrforces_tutorialvideos.htm`. Tutorials for terrain and modeling tasks were created using VR-Vantage. However the procedure for these tasks in VR-Forces are almost entirely identical.
- ♦ VR-Forces loads many files using relative paths from the working directory. Therefore, when you start VR-Forces from the command line, you must set the working directory to `./bin`. This is not mentioned in the VR-Forces documentation.

Bug Fixes

This release fixes the following problems that were present in prior releases (with bug-tracking numbers):

- ♦ Spot reports on the Makland terrain caused the front-end to crash. 48292
- ♦ Plans did not move to the next task after completing the tasks in a trigger block. 48574
- ♦ VR-Forces crashed if you opened an information dialog box for an unpublished object. 48586
- ♦ If a Fly task had a Wait task after it in a plan, the Fly task terminated. It should not have. 48622
- ♦ VR-Forces generated errors due to a change in the PSR name for the 120mm gun. 48629
- ♦ DFD files caused the TDB Tool to crash. 48392
- ♦ Marking text longer than 31 characters caused text to get deleted. Text is now limited to 11 characters. 48564
- ♦ IFF crashed HLA VR-Forces on rewind. 48722
- ♦ Ellipses could be oriented incorrectly depending on the underlying polygon. 48553
- ♦ Entities did not show up along terrain profile lines in certain circumstances. 48561
- ♦ Fixed wing aircraft now correctly take curvature of the earth into account when tasked to land on a runway that is a long distance away on a geocentric terrain. 48611
- ♦ The OPD Editor crashed if you tried to delete an object. 48536

- ♦ If the front-end had wireframe turned on, the Entity Editor model view was in wireframe mode. 48540
- ♦ In the Entity Editor, DI-Guy characters no longer had friendly names. 48519
- ♦ Paste Special did not work correctly. 48618
- ♦ `DtVrfSelectionHandler.lastDatabaseLocation()` returned the entity position, not the ground location. 48624
- ♦ If you edited a route while zoomed in, the observer teleported away. 48623
- ♦ There were timing issues when loading a scenario from the command line. 48676
- ♦ Moving an object from a locked overlay to an unlocked overlay did not reset its color. 48578
- ♦ It was not possible to print a global plan. 48575
- ♦ It was not possible to edit a Fly Altitude and Heading task in a plan. 48693
- ♦ VR-Forces generated multiple fire/detonation interactions for single fire events. 48726
- ♦ Jets did not execute the Orbit task. 48678
- ♦ New forces were not available in the GUI. 48653
- ♦ If a jet landed and then took off again, it did not accelerate to maximum speed. 48694
- ♦ The Sensor panel on the Entity Information dialog box did not always display data. 48833
- ♦ VR-Forces published the wrong dimensions for aggregates. 48853
- ♦ VR-Forces did not support unspecified soil types in the configuration file. 48902
- ♦ The Fire at Target task executed continuously even if told to fire once. 48810
- ♦ `DtWeaponController::acceptSensorTargettingInput()` did not work correctly. 48811
- ♦ Example files did not build. 48588
- ♦ Some DLLs were incorrectly copied to the `./lib` directory. 48439
- ♦ The Patrol Route task was not available on the menu for fixed-wing and rotary-wing entities. 47654
- ♦ VR-Forces did not automatically append the extension when you saved a file to MTF. 46552
- ♦ In the `embarkdemo`, one of the DIs embarked on the helicopter before it landed. 48545
- ♦ The Send Radio Set -> DI-Guy Appearance task did not list appearances. 46440
- ♦ The Last Clicked Location panel did not reflect the currently chosen display units. 45671
- ♦ DI-Guys did not behave properly when their posture was set to Squatting. 48727
- ♦ The Entity Palette and Props Palette sometimes disappeared. 47785
- ♦ When editing an object by right-clicking in the Objects List, the attachment was incorrectly changed. 45924

- ♦ When entities disembarked from a truck, they did not go to reasonable locations. 43490
- ♦ The AddAttr example was missing VrfExtend.fed. 48965
- ♦ Various problems with road driving have been resolved by the new Move To tasks. 46714 49096
- ♦ Creating an obstacle using the GUI API could crash the back-end. 48615
- ♦ Double-clicking an F-16 after it was destroyed caused the front-end to crash. 48691

Known Problems

VR-Forces Release 4.1 has the following known problems (with bug-tracking numbers):

- ♦ The following examples do not come pre-built in the Linux installer:
 - addConditionalGui
 - addSetGui
 - addSimCommandGui
 - interfaceContentGui.

In order to do build them to be used with VR-Forces, you must use the make command as follows:

```
make install
```

This should generate the files needed to use the plugins in Linux. 49336

- ♦ The first time you load a terrain (including the terrains supplied with VR-Forces), VR-Forces caches textures in its fast load format. This is a slow process. However thereafter, the terrain will load quickly. If you want to avoid runtime caching, you can preprocess the terrain with the medfTool before you load it. If you want to disable runtime caching, you can do so as described in [Section 10.10, "Configuring File Caching in VR-Vantage"](#), in *VR-Forces Configuration Guide*.
- ♦ Use of radio communications lines can affect performance. The front-end and back-end can become unsynchronized due to a slowdown in the networking thread.
- ♦ Changing the GUI icon or model mapping in the Entity Editor changes the icon or model for all Simulation Model Sets, not just the one being edited. 48443
- ♦ Ground vehicles and lifeforms will not avoid feature obstructions on geocentric terrains. 43868
- ♦ Some metaflight terrains, such as HarrisAfghanVillageFlatEarthMetaflight and HarrisAfghanVillageGeocentricMetaFlight will not display in the 2D view when first loaded. To see the terrain, change to a 3D view mode, and press the spacebar (center view on terrain) to move the eyepoint to the terrain location. After this, the terrain can be viewed in the 2D view. 43797

- ♦ The imagery for the makland terrain database is much larger than the actual terrain data, which is confined to the square inset in the middle of the image. This means that if you try to simulated entities on the outer areas of the image, simulation will fail because there is no terrain data there. 43867
- ♦ Fixed-wing entities crash when tasked to move into formation.
- ♦ The Getting Started scenario does not work as expected if B-HAVE is installed. This is due to problems with the PathData for VR-Village. To improve behavior, open `./vrforces4.0.4/appData/settings/B-HAVE/bhaveOptions.mtl` in a text editor and change the value for `unify-movement-tasks` to False.
- ♦ Geometry files referenced by a MetaFlight file must be in OpenFlight format, and not in Vega Prime's binary format (`.vsb`). MÅK's terrain libraries do not support `.vsb` files.
- ♦ Rotary-wing entities are not able to reach moving waypoints or land on moving ships. A rotary-wing entity will approach a given waypoint or landing point, but will never completely reach the goal.
- ♦ Dead lifeform entities may unexpectedly block line of sight. Their bounding volumes are always upright, regardless of whether or not they are dead.
- ♦ Embarked entities controlled by joystick cannot disembark. For example, if you use a joystick to control a fixed-wing taking off from a carrier, the aircraft will take off, but it will remain in an embarked state.
- ♦ Lifeform entities cannot be configured with multiple weapon systems.
- ♦ Not all languages can be used to name entity types in the entity editor. 42241
- ♦ Although the indirect fire controller will wait until the target location is paged in before executing a fire for effect task, it does not take into account the dispersion radius. This means that depending on the size of the page and the radius, some detonations might happen underground. 42682
- ♦ When `DtBallisticGun::createDetonationInteraction` has its "assureMiss" parameter set to true, it may not have terrain paged in for the area in which it needs to create the detonation (on the ground nearby). 42730
- ♦ Sometimes when you try to create a Friendly entity from the Create menu, the list of entities is not displayed. Selecting the Opposing or Neutral option and then going back to the Friendly option causes the list to be displayed. 42930
- ♦ In some cases, VR-Forces will fail to load a scenario if the main window of the GUI application does not have focus. 43547
- ♦ The road driving feature in VR-Forces requires that the road vectors making the network be connected at their edges. Some data does not have accurate positions for road ends, which will cause them to be disconnected, and the road driving unable to plan a path along those roads. 42895
- ♦ If you have a large size obstacle, it is possible that entities might get confused and travel through it. If this happens to you, it is recommended that you make smaller obstacles. 45549
- ♦ Entity intervisibility fans do not draw correctly on geocentric terrains. 44190

- ♦ When creating some lifeform entities, the 3D model attached to the mouse pointer when placing is inconsistent with the entity type that is being created. The entity that is created, however, is the correct type and does show the correct 3D model after it is created. 43728

The following known problems apply to the front-end:

- ♦ VR-Forces may crash on exit on Linux if your Linux installation is not at the latest version of *libselinux* (as of the date of this release).
- ♦ Some strings in the graphical user interface are not included in the translation files. Some strings, such as those on the Create menu, are in configuration files, such as *entity.mst*. Others are in settings files. You can translate these strings by identifying the appropriate configuration file and translating the strings. 47806
- ♦ The TerraSimSampleUrbanMetaFlight terrain is not initially visible when loaded in PVD. To see the terrain, press **e** to zoom in. This problem potentially exists for all paged terrains whose page-in distance is less than the default observer distance in PVD mode.
- ♦ Changing the hierarchy of raster map layers may cause a crash. 44498
- ♦ If a graphics card does not support shaders, you may receive the following error message when you load a terrain that uses them:

`Shader [Branches] validation failed`

To work around this problem, set the SpeedTree Performance Profile to Disabled, as follows:

- a. Choose **Settings** → **Display**. The Display Settings dialog box opens.
- b. Select the SpeedTree Settings page.
- c. In the Performance Profile drop-down list, select Disabled.