VR-Forces 4.2 Release Notes

This release note contains the following release-specific information for VR-Forces Release 4.2:

Systems Supported

VR-Forces 4.2 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++ 10.0 (32 bit and 64 bit)
Red Hat Enterprise Linux 6 (64 bit libraries)	default compiler

3D Video Cards Supported

VR-Forces 4.2 supports NVIDIA graphics cards that support OpenGL 2.0. VR-Forces does not support AMD (formerly ATI) graphics hardware.

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.

i   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 4.0.9d. 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 4.2 uses FLEXlm 11.11. 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 4.2 uses the indicated versions of the following libraries:

- VR-Link 4.0.9d.
- OpenSceneGraph 3.0.1.
- Boost 1.46.1.
- FreeGlut 2.4.0.
- DI-Guy 12.5.
- 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-TheWorld Online - MAK Earth.mtf* terrain, which has a highly detailed terrain of Honolulu, Hawaii.

Running 32-bit Applications on 64-bit Windows 7

Windows 7 has a bug that causes applications to crash when running a 32 bit application on 64 bit Windows with large addresses enabled (which allows 32-bit applications to use more than 2 GB of memory). This bug affects VR-Link-based applications, such as VR-Forces. Microsoft has a hotfix that fixes this problem. For details and the hotfix download, please go to http://support.microsoft.com/kb/2588507.

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 4.2 was built against VR-Link 4.0.9d 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 4.2 is compatible with applications that use earlier versions of VR-Link if they support versions of the RPR FOM listed.

The VR-Forces 4.2 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 4.2 supports DIS 4, 5, and 6, and can therefore interoperate with DIS applications of any of these versions.

Backwards Compatibility

The VR-Forces 4.2 APIs are not compatible with VR-Forces 3.x or earlier. It is largely compatible with the 4.1.x API. Small changes may be necessary to migrate from 4.1.1.

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

RPR FOM Versions Supported

VR-Forces 4.2 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 4.2 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 4.2 relies on the LgrControl and View-Control custom MÄK extensions.

New Features and Updates

VR-Forces 4.2 has the following new features and updates.

- Reactive tasks. Reactive tasks are scripted tasks that become active when a particular condition becomes true. For details, please see Section 6.3, "Reactive Tasks" and Section 13.2.8, "Creating Reactive Tasks," in *VR-Forces Scenario Management Guide*.

- Improved support for naval movement, visualization, and warfare:
  - Improved route following and entity following.
  - New behavioral models for surface and subsurface entities.
  - Improved Sail Heading task.
  - Move to Depth task for subsurface entities. For details, please see Section 7.38, "Move To Depth," in *VR-Forces Scenario Management Guide* .
  - Move to Waypoint and Move to Location tasks with path planning that take into account ocean depth. For details, please see Section 7.41, "Move to Location (Plan Path)" and Section 7.44, "Move to Waypoint (Plan Path)," in *VR-Forces Scenario Management Guide* .
  - Sinking behavior for destroyed vessels.
  - Fire Torpedo tasks for subsurface entities.
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i   The Fire At Target task is no longer supported for subsurface entities. If you have a scenario that uses it, you will have to update the scenario to use a Fire Torpedo task.

  - Visualization of sea states. For details, please see Section 12.5, "Configuring Marine Conditions,", in *VR-Forces Scenario Management Guide*.
  - Ocean planar reflections. For details, please see Section 17.3, "Displaying Ocean Planar Reflections," in *VR-Forces Users Guide*.
  - Support for multiple guns on naval vessels.
  - Sonar sensors, including sonabuoys and trailing sonar. Support for active and passive sonar. New tasks and sets for configuring and activating sonar. For details, please see Section 7.7, "Deploy Sonobuoy," Section 7.8, "Deploy Sonobuoys Along Route," Section 7.58, "Sonar Dip," and Section 8.2, "Active Sonar Mode,", in *VR-Forces Scenario Management Guide*.
  - Ability to drop naval mines and depth charges. For details, please see Section 7.12, "Drop Naval Depth Charge," and Section 7.14, "Drop Naval Mine," in *VR-Forces Scenario Management Guide* .

– Support for International Hydrographic Organization (IHO) S-57 data. S-57 is a vector interchange format for maritime charts. For details, please see Appendix I, *Configuring Feature Data*, in *VR-Forces Configuration Guide* and other sections that discuss feature data.

◆ The object parameters database has been dramatically reorganized. The Entity Editor and OPD Editor have been redesigned to accomodate the new object parameters database oganization. For details please see Changes to the Object Parameters Database, on page 8.

◆ Ability to organize scripted tasks into Behavior Sets. Behavior Sets let you enable or disable a set of scripted tasks for a force. By using them you can globally change the set of behaviors/tasks that entities execute in response to the changing dynamics of a simulation. For details, please see Section 6.4, "Using Behavior Sets to Manage Scripted Tasks," in *VR-Forces Scenario Management Guide*.

◆ Ability to specify the countries in which a vehicle is being used. This is configured in the Entity Editor and a new filter has been added to the Entity Palette.

◆ In previous releases, you could change the Entity Editor GUI by editing *entityEditorUi.mtl*. This file is no longer used. You can change the Attributes panel by editing *.ui* files in *./data/simulationModelSets/<sms>/gui/ui*. For details, please see Section 4.4, "Adding Variable Bindings to Platform and System Files," in *VR-Forces Configuration Guide*.

◆ Scripted animations. Similar to ballistic missile movement, you can now script movement for other entities. For details, please see Section 7.2, "Animated Movement," in *VR-Forces Scenario Management Guide*.

◆ Support for lighting effects. For details, please see Chapter 17, *Lighting Effects*, in *VR-Forces Users Guide*.

◆ The Entity Information dialog box has a new tab that provides detailed information about entity task execution and status.

◆ Improved fixed-wing takeoff and landing behavior.

◆ Spot report icons fade over time if the entity is no longer detected.

◆ Spot reports are now included in entity lists and can be selected for tasks, such as Follow Entity or Fire at Target. For details, please see Section 10.1.6, "Using Spot Reports in Tasks," in *VR-Forces Scenario Management Guide*.

◆ Ability to configure the layout of menus, toolbars, panels, and context-sensitive menus. For details, please see Appendix E, *Configuring the GUI*, in *VR-Forces Configuration Guide*.

◆ Many new entities have been added. (Most do not have 3D models.)

◆ Support for DI-Guy 12.5 and skinned characters. If you have added custom characters in previous versions of VR-Forces, you will have to customize the new version of *character_digest.xml* for your characters. The format has changed from that used in previous versions of VR-Forces. *character_animations_table.mtl* uses the same format as previous versions.

◆ Helicopter rotor animation in the Stealth view is now controlled by the power plant appearance bit. If the power plant is off, the rotors do not spin.

- Entity model catalog (*VRFEntityCatalog.pdf*). A list, by category, of the entities configured in the Entity Editor, including basic attribute information and a screen capture of the 3D model for each object.
- Scripted tasks can now access information about fire and detonation interactions.
- Scripted tasks can detect if an opposing force missile is within range.
- The Lua API function vrf:getSimObjectsNear() no longer returns the ownship object in the list of nearby objects.
- When you create a new scenario, if you give it a name, this becomes the default scenario name when you save it.
- In previous releases, when you assigned a task that included a location by clicking on the terrain, the altitude was set to zero. If you did not change the altitude, an aircraft would fly to zero altitude and crash. In this release, if the altitude is set to zero, an entity uses its current altitude as the target altitude.
- The subtask example has been removed. The recommended way to handle subtasks now is using Lua tasking.

Changes to the Object Parameters Database

The object parameters database has been significantly changed. Going forward, these changes should make it easier to migrate customized simulation model sets to new releases. It will also make it easier to add new entity simulation models.

The "higher level" organization of the OPD now consists of a set of "platforms" and entity files. The platforms are generic OPE files that represent the basic entity and object types, such as ground platforms, surface platforms, line objects, area objects, and so on. These files use the familiar MTL format. It is expected that platforms will rarely change. Any changes to a platform affect all entities of that platform type.

Individual entities no longer have OPE files. Entity specific parameters are saved in XML files with the *.entity* extension. As with the OPE files used in the past, entity files reference the systems that an entity supports. Systems continue to be specified in system definition files in MTL format. Other SMS files such as damage files, detection files, formation files, and so on have not changed from previous releases.

The Entity Editor has been updated to use these new entity files. Although the physical layout has changed, for the most part its usage remains the same as in the previous release. When you edit an entity you now just edit its entity file. When you create a new entity, you create a new entity file. The entity file also contains the object type, which used to be in *vrfSim.opd* and the menu details that used to be in *entity.mst*.

The OPD Editor no longer edits individual entity parameters. It lets you edit platforms and systems. Changes to platforms and systems affect all entities that use them.

The result of these changes is that to add a new entity, you create a new entity file in the Entity Editor. To migrate to a new release, you simply copy your custom entity files (and any files that they reference) into the SMS in the new release. The entity file will pick up any changes made to the platforms for the new release. You no longer have to update OPE files and *vrfSim.opd*. *vrfSim.opd* still exists, but simply contains variable bindings for the platforms.

You will still also have to update entity type mappings and model definitions for your custom entities.

Migrating Legacy Simulation Model Sets to the VR-Forces 4.2 Format

The Entity Editor has a built-in tool that can upgrade simulation model sets from VR-Forces 3.12 through 4.1.1 to the new format. This tool does not change any of your legacy files. It copies a set of core files from the current release to the new SMS, such as OPE files, system scripts, and system definitions. Then it converts the entity models in the old SMS to the new format. If any of the files in the old SMS conflict with files copied from the new SMS, they are not copied. Differences may be due to changes made to scripts and system definitions for the new release, or they may be due to customizations made to the old files. If you have customized old scripts and system definitions and want to migrate the chanages to VR-Forces 4.2, you will have to make the changes by hand.

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> The upgrade process does not update DI-Guy appearances. The old list of appearances for random selection continues to be effect. As a result, skinned characters will not be used. If you want to update the random appearance options for DI-Guy characters, you will have to update them manually.

To migrate a simulation model set to VR-Forces 4.2:

1. Open the Entity Editor.

2. Choose **File → Upgrade Old Simulation Model Set**. The Select SMS to Upgrade dialog box opens.

3. Select the SMS that you want to upgrade.

4. In the New SMS Name text box, type a name for the upgraded SMS.

5. Click Finish.

   The Entity Editor displays a status window. It copies files from the current default SMS to the new SMS. Then it converts files from the old SMS to the new format.

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.

In HLA, VR-Forces can change the transport type Data interactions at run time based on the content type of the message. Before sending a message, VR-Forces checks to see if it should be best-effort or reliable. If the current setting does not match what is required for the content type of the message, it makes an RTI service call to update the transport type.

DtVrfMessageInterface has new methods to allow a plug-in to change transport types as well.

By default, the following content types are sent reliable. Everything else is best-effort.

- DtRemoveFromOrganizationType
- DtSetSubordinateOrderType
- DtAddToOrganizationType
- DtIfObjectIndexMessageType
- DtScriptedTaskResponseMessageType.

Documentation Updates

Documentation has been updated for this release. A catalog of entity models has been added. The following paragraphs note errors and updates to the documentation.

- Some of the images in the Entity Model Catalog may be incorrect. This mostly applies to DI-Guy characters.
- Some screen captures in the manuals may not match the final versions of the dialog boxes.
- The chapters in *VR-Forces Configuration Guide* that describe the Entity Editor and OPD Editor were renamed after some books were finalized. Cross references to these chapters use the old names, but hypertext links go to the correct chapter.
- In Section 14.7, "Showing and Hiding Intervisibility Lines," in *VR-Forces Users Guide*, the menu path **Intervisibility** → **Intervisibility**, should read **Intervisibility** → **Enable/Disable Intervisibility**.
- Section 5.8 in *VR-Forces Users Guide* lists the default connection configurations in the VR-Forces Launcher. Some of the connections in that list are no longer provided.
- VR-Forces models sinking for surface entities that get destroyed. However, the visualization of ship sinking only approximates the ship's position and orientation in the back-end.
- The introduction to MAK Terrain Database Tool Users Guide and online help for the TDB Tool states that it is used to generate PathData for the B-HAVE Module for VR-Forces. This is no longer the case.

- The following new vrfGui command-line arguments are not documented. They are used to improve visual performance:
  - `--antiAliasing level`. Set the anti-aliasing level (0, 2, 4, 8, or 16. Default: 4.
  - `--depthBits bits`. Sets the depth of graphics to 24 bits or 32 bits. Default: 24.
  - `--stencilBits bits`. Sets the number of stencil bits (0 or 8). Default: 0.
- Section 18.8 in *VR-Forces Users Guide* lists terrain databases provided with VR-Forces. The file listed as *VR-TheWorldOnline -Massachusetts Maritime.mtf* is actually named *VR-TheWorld Online - Massachusetts S-57.mtf*. The file *VR-TheWorld-Online - High Resolution Bathymetry.mtf* is no longer provided. The bathymetry data is now part of *VR-TheWorld Online - MAK Earth.mtf*.
- The following sections contain information that was not included in *VR-Forces Users Guide* (ocean planar reflections) and *VR-Forces Configuration Guide* (object geometry).

Adding Object Geometry to an Entity

Object geometry is to an entity as terrain is to the earth. It allows embarked entities to move about on the entity on which they are embarked. For example, adding object geometry to an aircraft carrier lets planes taxi on the deck of the carrier. You can add object geometry to entities in the Entity Editor. Object geometry must be in Open-Flight or GDB format. OpenFlight geometry gets converted to GDB and saved.

> **i** When you edit an entity's embarkation points and slots, the model used is the visual model. This will not necessarily line up with the object geometry for that entity, if it has any.

To add object geometry to an entity:

1. Select the entity to which you want to add object geometry.

2. In the attribute panel, on the Object Geometry line (Figure), type the path to the object geometry file or click the browse button and select a file.
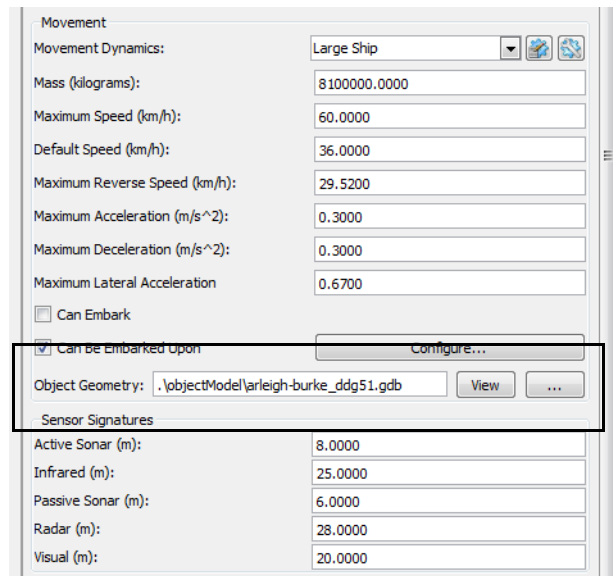
Figure 1-1. Object geometry line

If you select a GDB file, the object geometry view window opens (Figure). If you select an OpenFlight file, the Select Model dialog box opens (Figure).
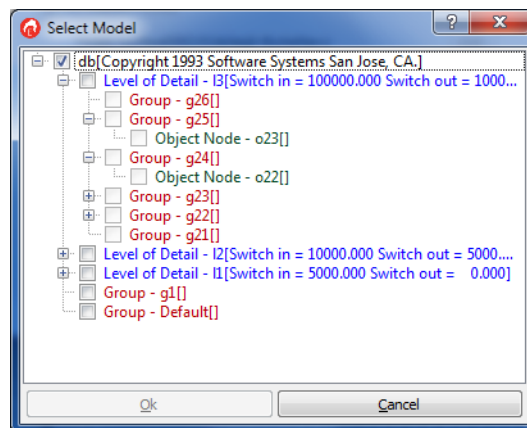

Figure 1-2. Select Model dialog box

a. In the Select Model dialog box, select the geometry that you want to use.

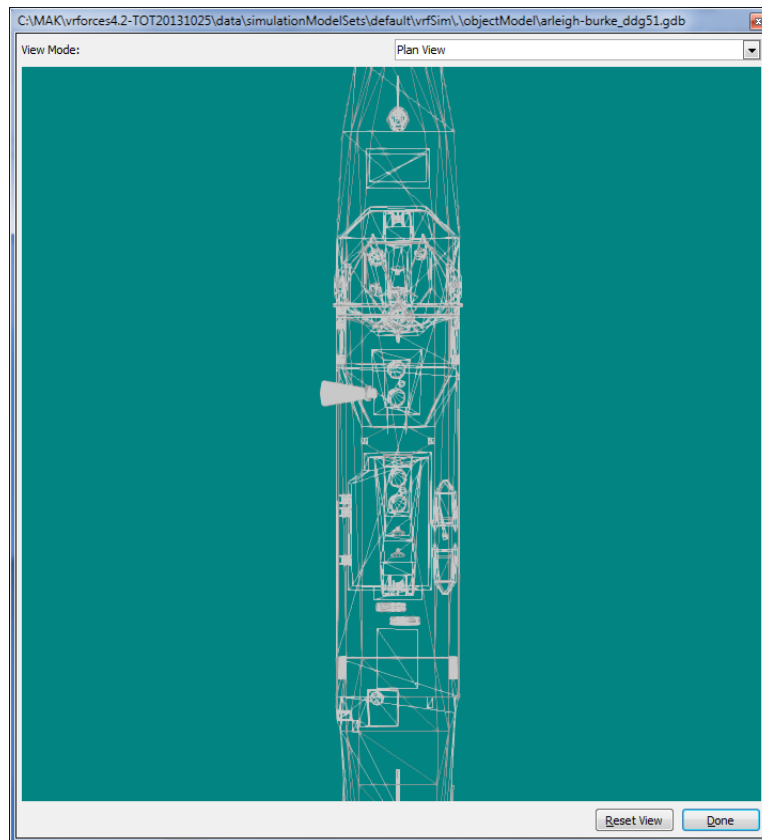b. Click OK. The object geometry view window opens.

Figure 1-3. Object geometry viewer

3. To close the window, click Done.

Viewing Object Geometry

You can view the object geometry for an entity.

To view an entity's object geometry:

1. Select the entity.

2. In the attributes panel, on the Object Geometry line, click View. A display window opens .

3. To close the window, click Done.

Configuring Ocean Planar Reflections

To reduce the performance impact of ocean planar reflections, you can configure the distance at which they are clipped (and therefore not displayed) and the LOD scale. The LOD scale affects the distance from the observer at which VR-Forces switches LODs. The higher the value, the more quickly LODs are switched.

To configure ocean planar reflections:

1. Choose **Settings** → **Display**. The Display Settings dialog box opens.

2. Select the Render Settings page).

3. To change the ocean planar reflectsion LOD scale, adjust the slider.

4. To set the ocean planar reflections far clip distance:

    a. Select the Ocean Planar Reflections Specific Far Clip check box.

    b. Adjust the slider or enter a value in the box.

Bug Fixes

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

* Some DI-Guy characters listed in the Entity Editor are not available on the Entity Palette. These characters are being retained in the SMS for backwards compatibility with existing customer scenarios, but they are of poor quality and are not intended for use in this and future releases.

* Fixed-wing entities crash when tasked to move into formation. 10255

* Entity intervisibility fans do not draw correctly on geocentric terrains. 44190

* If you moved a vehicle along a route as a road, you could not move along a route not treating it as a road. 50131

* When using a joystick, the ballistic gun controller did not pre-load ammo when the scenario started, so entities could not fire. 49742

* Buildings were aligned to the terrain, not gravity. 50162

* The Entity Editor changed entity type enumerations after the user had already set them. 49945

* Changes to Lua scripts did not get saved if you clicked Update while the script editor was still open. 49962

* It was not possible to paste an aggregate that had a plan. Subordinate entities were not pasted. 49611

* MGRS coordinates did not have enough precision for editing routes. 50616

* The Overlays tab on the Objects List Panel had several bugs. 50669

* Submarines had a variety of movement problems. 49146, 49150, 10040

* The Lua funciton getFeaturesWithinRange() took altitude into account when it should not have. 49444

- DI-Guys did not respond properly to Set Posture. 38413
- Torpedoes could fly out of the water. 10254
- The default orbit and linear speed values were too slow.
- If an entity with an intervisibility line attached to it moved, the range and bearing labels did not update. 48854
- Intervisibility fans were not displayed correctly when using VR-TheWorld. 44190
- If you changed the size of the arrow in a freehand line in a 3D projection, it did not update. 49578
- Range and bearing labels were incorrect. 49528
- Getting too close to a track history made it disappear. 47202
- Semi-transparent objects, such as X trees, had halos. 49966

Known Problems

VR-Forces Release 4.2 has the following known problems (with bug-tracking numbers):

- If you create a variable binding in the OPD Editor, it does not get saved. 51169
- If you load a saved scenario and then move a lifeform, its heading gets set to 0. 51122
- The Fire at Target task does not work correctly for rotary wing and fixed wing entities. 51086
- If you drag a scenario script in the Scripted Tasks window, it gets reset to the default template. 51052
- Sometimes child DI-Guy entities are invisible. 51000
- Expand All and Collapse All affect the entire aggregate rather than working up or down from the selected aggregate member. 51166
- Aggregates have various difficultires moving into formation. 51160 51036
- If you load the MAK Earth terrain after you have loaded other terrains, it does not page in the highest LODs. 51151
- If you connect to a terrain server and then connect to it again without first closing the connection, the terrain becomes unusable. 51044
- Some environmental effects do not work well if you have multiple observers.
- If you attach the observer to an entity that is displaying communications lines and you turn off communications lines, VR-Vantage crashes. 51120
- Restoring CameraFX sensors to factory settings breaks the sensors. 51159
- GL Studio (and therefore cockpits) is not supported on Linux.
- Sound effects are not supported on Linux.

- Enabling wakes, spray effects, and the buoyancy model when in PVD observer mode can seriously degrade performance. These features are disabled by default. If you inadvertently enable them and experience this problem, switching to Stealth mode and back to PVD restores performance. 51037

- The SMS upgrade process does not update DI-Guy appearances. As a result, the old random appearance list is used and upgraded SMSs will not use skinned characters. 51010

- Attaching object to an entity does not work except for waypoints. 50849

- Saving large Lua objects can hang the back-end. 50750

- When you disaggregate an aggregate, it is collapsed instead of being expanded. 50459

- If an aggregate is moving to a location, settings its formation causes the task to be skipped. 50452

- When you add a Lua task to a menu, it does not appear on the menu until you reload the scenario. 50315

- Ships that are given a patrol route task do not move along the route from the end to the beginning. They go directly from the end point to the start point. 50378

- Some bounding volumes are incorrect. 50737

- If you create an object on a terrain that has multiple LODs that has not paged in to the highest LOD, and you set the altitude to some value above the terrain, it is possible that when the terrain pages in to the highest LOD, the location you specified will no longer be at the desired altitude above the terrain. It might even be below the terrain. The reverse can also occur. If you place an object when the highest resolution LOD is paged in and then zoom out, the object might disappear from view. However, in this case, the object is still in the correct location relative to the highest resolution of the terrain.

- On Linux, if you install VR-Forces in one directory and user data in another directory, VR-Forces will not start. 50538

- If you change the color of a text tactical graphic to black, the text is not displayed. 50525

- Links from the Developers Guide to PDF documentation sometimes go to the first page of the PDF instead of the intended location. This behavior depends on the browser and version of the Adobe Acrobat Reader plug-in that it uses. It is a known problem in Mozilla Firefox.

- If you create a folder in the Save dialog box and it has a space at the end of the name, Windows does not recognize the existence of the folder. If you try to delete it, the system may blue screen. Running scandisk can solve this problem. 50190

- If the check() function in a reactive task does not return a value, the back-end will crash.

- 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 10.13, "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 lower left corner 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

- 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 *./vrforces4.2/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*). MÄK's terrain libraries do not support *.vsb* files. 11772

- 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. 12801

- Dead lifeform entities may unexpectedly block line of sight. Their bounding volumes are always upright, regardless of whether or not they are dead. 36648

- 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. 37175
- Lifeform entities cannot be configured with multiple weapon systems. 40408
- 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
- 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
- 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. 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
- When a DI-Guy character is given an animation that involves kneeling, the DIS posture is set to kneeling. Therefore when the animation completes, the entity will continue to kneel. 38103

 ◆ 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.