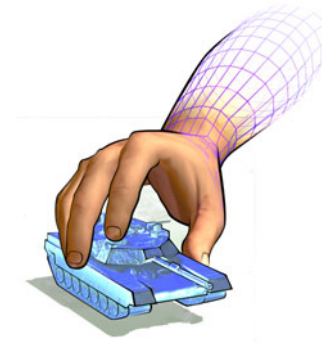




VR-Forces 3.9.2 Release Notes

This release note contains the following release-specific information for VR-Forces Release 3.9.2:

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Systems Supported

VR-Forces 3.9.2 is available for the platforms listed in [Table 1](#). For the availability of other platforms, contact your MÄK salesperson. 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	glibc
Red Hat Enterprise Linux Workstation 3	GNU C++ (GCC) 3.2.3	2.3.2
Red Hat Enterprise Linux Workstation 4	GNU C++ (GCC) 3.4.4	2.3.4
Red Hat Fedora Core 3	GNU C++ (GCC) 3.4.4	2.3.6
Windows 2000 SP2, XP	Microsoft Visual C++ 6.0, Service Pack 5 Microsoft Visual C++ 7.1	

Windows 2000 Requirements

Windows 2000 has the following requirements for running VR-Forces:

- To run VR-Forces, you must install the latest version of DirectX, available from the Microsoft web site.
- If you are building VR-Forces with MSVC++ 7.1, you must install the latest version of the DirectX SDK (obtainable from Microsoft).

Patching the Microsoft Visual C++ 6.0 Compiler

VR-Forces is transitioning to use of the Standard Template Library, particularly for lists and map objects. Microsoft Visual C++ version 6.0 has a bug with the STL that is fixed with the supplied *xtree-msvc++patch* file. If you use MS Visual C++ version 6.0, you must install a patch to a standard header file. The patch comes from Dinkumware, Ltd (the company that developed the Standard C++ Library header files for Microsoft), but for convenience, we are distributing it with VR-Forces releases.

The patch fixes a bug that would cause applications to crash if they pass `std::sets` or `std::maps` from an application to a DLL or vice-versa, something that IEEE 1516 federates must do. For details about the patch go to http://www.dinkumware.com/vc_fixes.html.

To install the patch:

1. In the top level VR-Forces directory, is a file called *XTREE-msvc++patch*. Rename this file *XTREE*.
2. Make a back-up version of the original *XTREE*.

3. In the Visual Studio *include* directory (for example, *C:\Program Files\Microsoft Visual Studio\VC98\Include*), replace the original version of *XTREE* with the patched version.

Building on Linux

The example Makefiles require a patched version of gmake 3.80, which has been included for your convenience in the *./mkbin* directory. This version of gmake is based on version 3.80, but includes a memory fix that is needed to use our makefiles. The source code for the modified gmake is freely available from <http://ftp.mak.com/out/gmake3.80-patch1.tar.gz>. This patch will be included in future versions of gmake.

Before you compile the examples, go to the top level of your installation and create a symbolic link 'VR-Link' to your VR-Link installation and another called 'RTI' to your RTI installation.

Disk Space Requirements

A full installation of VR-Forces requires approximately 540 MB of disk space. Terrain databases use approximately 106 MB and documentation (primarily the class reference) uses 200 MB.

Compiler Compatibility on Windows

MÄK provides versions of product releases that have been compiled with Microsoft Visual C++ 6.0 and 7.1. When you run MÄK products together on the same computer, for example, VR-Forces and the 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 3.9.6. If you are building for HLA and want to link with the MÄK RTI, use MÄK RTI 2.x.

VR-Forces 3.9.2 is a parallel release to MÄK Plan View Display 3.9.2. It is not compatible with previous releases of VR-Forces.

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 Trolltech. The VR-Forces GUI was built with Qt release 3.3.5. A VR-Forces developer's license includes a Qt development license. MÄK provides you with a Qt license key. However, you must download the correct version of Qt from www.trolltech.com.

Third-Party Library Requirements

DtTerrainProfileWidget is based, in part, on the work of the Qwt project (<http://qwt.sf.net>). To compile examples or user projects, you must download the QWT distribution at <ftp://ftp.mak.com/out/qwt-0.4.1.zip>. This distribution is known to work with VR-Forces. Set the MAK_QWTDIR environment variable to point to the location of the QWT library.

Network Compatibility

HLA only

VR-Forces 3.9.2 was built against VR-Link 3.9.6 and is compliant with:

- ♦ RPR-FOM 1.0 and a subset of 2.0 (draft 6 and 17)
- ♦ MÄK RTI 2.4.2
- ♦ DMSO RTI NG 6.



If you need to run the Linux version of VR-Forces with the DMSO RTI, contact MÄK technical support.

VR-Forces 3.9.2 is compatible with applications that use earlier versions of VR-Link if they support versions of the RPR FOM listed above.

DIS only

VR-Forces 3.9.2 supports DIS 2.0.4, IEEE 1278.1, 2.1.4, and IEEE 1278.1a, and can therefore interoperate with DIS applications of any of these versions.

Backwards Compatibility

VR-Forces 3.9.2 is fully compatible with VR-Forces 3.9.

RPR FOM Versions Supported

VR-Forces 3.9.2 has built-in support for versions 1.0 and 2.0 (draft 6 and 17) of the RPR FOM. It also supports VR-Link's ability to support alternative FOMs through the FOM Mapper. By default, VR-Forces 3.9.2 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 3.9.2 relies on the LgrControl and View-Control custom MÄK extensions.

New Features and Updates

VR-Forces 3.9.2 is a maintenance release. It has no new features. Please see *VR-Forces 3.9 Release Notes* for features introduced in VR-Forces 3.9.

Documentation Updates

The following section should be included in *VR-Forces Configuration Guide*, section 2.5.5:

Converting OpenFlight File Texture Data to GDB

OpenFlight files do not contain information about soil characteristics, which VR-Forces models need to calculate entity mobility.

To provide soil characteristic data for VR-Forces, when the VR-Forces loads an OpenFlight terrain database, it tries to deduce soil type information from the names of the texture files that are usually associated with OpenFlight files.

By default, the VR-Forces tries to determine the soil types by looking for keywords, such as road, street, grass, water, and so on, in the name of the texture file. If this method does not adequately capture soil type information in the file you are importing, you can map the texture files to soil types.

The list of supported soil types is fixed, therefore, you cannot add new soil types. Map the texture files to supported types as follows:

```
SurfaceCharacteristicMap
{
    Match      HL_water                ocean
    Match      Water_Ocean_Deep_Blue  ocean
    Match      Tree_Evergreen          tree
    Match      Tree_Canopy_Evergreen   forest
    Match      Road_Highway_Two-Lane_Asphalt pavedRoad
    Match      Road_Street_Single-Lane pavedRoad
}
```

Bug Fixes

This release fixes the following problems:

- Linear and areal terrain features are now avoided by entities who are configured to avoid them.
- The path planner now more closely follows vector road features when roads are very straight, but not perfectly straight.
- The sensor signature propagation algorithm has been improved to reduce the number of line-of-sight checks in cases where objects are within sensor geometry, but beyond the sensing capabilities of the sensor (that is, their signature is too low to be sensed). This change provides a significant performance increase in some situations.
- The type of the emitter beam published by VR-Forces entities with emitter systems can now be configured in the OPE file using the "type" parameter for each beam in the "beam-list". This will determine whether the RadarBeam class or the JammerBeam class is published in HLA. The default is to publish the RadarBeam class. Previously VR-Forces published the JammerBeam class only.
- When undocked, the Utility Bar did not remember its size when it was moved.
- When you change the name of an entity to another language and you assign it a task, the task is now assigned correctly.
- When you show entity information in HLA, the resource tab is now displayed.

- ♦ Geocentric OpenFlight files can now be loaded.
- ♦ Intervisibility lines are correctly displayed.
- ♦ If you delete the third entity in a five entity aggregate, entities four and five are no longer removed from the aggregate.
- ♦ Objects that do not have a Z value (area, phase line) are now created properly when the coordinate system is set to geocentric.
- ♦ You can now translate conditional text in conditional view panel.
- ♦ When you right click on a line object and start an intervisibility line, the origin point is now placed correctly.
- ♦ Selected objects no longer become unselected when you move a vertex.
- ♦ If a subordinate falls behind while moving along a route in formation, it now speeds up to catch up to the others in formation.
- ♦ The front-end no longer crashes when you select the Attached To tab in the Information dialog box for a non-published object.
- ♦ If no database was open and you dragged an object from the echelon panel, the front-end crashed.
- ♦ Pressing on the side of a Stealth Navigation toolbar button did not move it in the direction of the mouse press, but in the direction the Stealth was last moved.
- ♦ The Terrain Profile window did not display terrain height correctly if the display units were not set to meters.
- ♦ The Overlay Palette and create control objects dialog boxes now correctly show translated text.
- ♦ If a fixed-wing entity had two successive move-along tasks in a plan, the second task would fail.
- ♦ Postures are now correctly saved to the order of battle file for dismounted infantry.
- ♦ You can now resize and freely rotate ellipses.
- ♦ Icons for environmental and control objects are now displayed correctly in lists and dialog boxes.
- ♦ The DMSO RTI reported errors when attempting to load a scenario from the command line in combined mode.
- ♦ `Intersects (%d)` text did not translate correctly to other languages.
- ♦ The IFF controller can now be added to entities in the OPD Editor.
- ♦ Ellipses that are rotated and have a fill pattern are now drawn correctly.
- ♦ You can now open and display geodetic shape files on geodetic database.
- ♦ User data is now saved to the order of battle file and sent back to the front-end if used.
- ♦ Ground entities were configured to avoid water by default. This prevented them from crossing water while following vector features.
- ♦ The Terrain Database Information dialog box did not display information for Lamberr CC databases correctly.

- ♦ The Tdbtool swapped the "NE Corner" and "SW Corner" after an image was resized.
- ♦ The Entity Destroyed conditional dialog box crashed after pressing "OK" when using the pattern tab or when using the "use self" option.
- ♦ Lines with transparency applied shifted position when a scenario started to run.
- ♦ Cruise missiles would fly at the altitude of their target too soon if the target changed position. Missiles now correctly wait until the direct-fly-elevation-angle or the direct-fly-range parameters indicate they should start changing altitude.
- ♦ You can now include command-line arguments after the `-z` argument on a command line or in *vrf.bat* as in the following example:

```
vrfGui.exe -z "vrfSim.exe -d myVrfSim.mtl"
```


Known Problems

VR-Forces Release 3.9.2 has the following known problems:

- ♦ Aggregates composed of fixed-wing entities can only perform limited behaviors as an aggregate.
- ♦ When you aggregate a set of aggregates into a higher-echelon aggregate using the Aggregate As menu item, make sure that the aggregates being combined have been collapsed to their highest level. Failure to do so will aggregate the entities at the level they are currently displayed. For example, suppose that you want to aggregate two teams of two tanks each into a platoon. If at the time of the Aggregate As operation, one of the teams is expanded, displaying its constituent tanks, while the other team is collapsed, displaying a single team icon, the resulting platoon will be composed of two individual tanks and a team, instead of two teams.
- ♦ Fixed-wing take-off, landing, and taxiing behaviors may be difficult to configure through the front-end when simulating on geocentric terrain databases. This is due to the fact that it uses a different projected terrain database in the front-end when simulating on a geocentric terrain database in the back-end. Correlation errors in terrain elevation between the two databases must be small (on the order of meters) when placing waypoints or routes on the ground to support fixed-wing ground behaviors. Either use high resolution terrain databases (minimizing the elevation error between the front-end and back-end databases) when configuring these behaviors, or restrict your scenarios to fixed-wing flying behaviors.
- ♦ Using the *tdbtool*'s balancing option (`-b br,lf`) to balance certain terrains may cause the generated *.gdb* file to display incorrectly. This has to do with a draw ordering bug that is not currently corrected for all terrains. The resulting GDB file will still give correct intersection information, so it will still be suitable for simulation purposes.
- ♦ Vector clipping does not work properly with areal features.
- ♦ Surface entities are not configured to fire weapons. You can customize the object parameters database entries to enable this.
- ♦ The Qt translation files (in *.translations*) for built-in Qt-level GUI items do not work properly. The translation files for VR-Forces work correctly.
- ♦ If you are running VR-Forces on Linux with the DMSO RTI, you cannot run in combined mode. Start the GUI and back-end separately.
- ♦ The order in which you create plans for aggregate units and individual members of aggregate units affects how the plans are implemented. If you create a plan for an aggregate member and then create a plan for the aggregate, the aggregate plan overrides the individual plan. If you create a plan for an aggregate and then create a plan for a member of the aggregate, the member plan is executed.
- ♦ If you run a MÄK Logger recording of a VR-Forces simulation and the site:application number for the back-end is the same as the site:application number of the back-end used to create the recording, VR-Forces may crash. To avoid this problem make sure that you run VR-Forces with different site:application numbers, or just run the front-end and use it as a plan view display to view the recording.

- ♦ The component descriptions in Appendix C of *VR-Forces Developer's Guide* have not been updated to reflect changes made in recent releases of VR-Forces. In particular references to port interfaces are obsolete and the component descriptions do not reflect the use of process state repositories. Fixed-wing and rotary-wing components may be significantly incorrect.
- ♦ Using large filled polygons, such as minefields, in overlays can degrade performance.
- ♦ You cannot load vector data with geocentric databases. Vector data works only with geodetic or UTM databases.
- ♦ You cannot give a helicopter a Set Altitude request that places it at less than the starting height value.
- ♦ Plans stop executing if they encounter a task that they cannot execute. For example, if the plan for a rotary-wing entity include Turn To Heading, which is not a valid task for rotary-wing entities, the plan stops executing.
- ♦ If you delete an entity that has a plan and create a new entity with the same name as the deleted entity, the old plan is displayed in the new entity's Edit Plan window. However, the new entity cannot execute that plan.
- ♦ Missiles get initialized at their maximum velocity. They do not accelerate to maximum velocity.
- ♦ Torpedoes ignore a polygon with soil type water, but the intervisibility fan does not. So it does not show an accurate representation of who can see who.
- ♦ When a subsurface entity gets destroyed it jumps to altitude 0.
- ♦ If you task a rotary-wing entity to fly to a waypoint on the ground, it will land when it gets to the waypoint. If opposing force trucks get within range of the rotary wing it will fire. Since the rotary-wing entity is at a slight incline, it will fire directly into the ground and explode.
- ♦ Intervisibility works with linear and areal features, but not with point features.
- ♦ Occasionally, VR-Forces is unable to load a scenario. When this happens, delete the contents of the *./data/temp* directory and try loading again.
- ♦ Setting the heading of a rotary wing entity whose altitude is less than the **starting-height** parameter causes it to rise up to the **starting-height** value. The workaround is to set a very small (non-zero) **starting-height**.
- ♦ You cannot use translation files to translate entity labels.
- ♦ You cannot use translation files to translate labels in the Create Entity menu (vrf.ent).
- ♦ The Terrain Tool (imagesplitter) does not convert images to Lambert Conformal Conic correctly.
- ♦ If you drag a toolbar onto the Utility Toolbar, you will not be able to dock that toolbar anywhere else in the VR-Forces window.

- ♦ When starting the Windows version of VR-Forces in DIS on a computer that is not connected to a network, the front-end will not detect the back-end. This makes it impossible to create or load scenarios. To prevent this problem, put `-A 127.0.0.1` on your command line. This problem affects combined mode and separate mode.

