



MÄK VR-Forces 1.3 Release Notes

This release note contains the following release-specific information for VR-Forces Release 1.3 and 1.3-ngc:

Systems Supported	2
Network Compatibility	3
RPR FOM Versions Supported	3
RTI Support	4
New features	5
Documentation Updates	6
Known Problems	11

i

Because DMSO RTI 1.3 NG is not link compatible with the previous generation of DMSO RTI releases, we have (for PCs only) released two versions of the VR-Forces – one that works with RTI NG, and one that works with RTI 1.3vx. The default directory for the version that supports RTI NG is *vrf1.3-ngc*. The default directory for the other version is *vrf1.3*.

Systems Supported

VR-Forces 1.3 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

Platform	Compiler
SGI IRIX 6.5 (VR-Forces 1.3-ngc only)	MipsPro7.2.1 C++ compiler (available from SGI)
SGI IRIX 6.2 or later (VR-Forces 1.3 only)	MipsPro7.1 C++ compiler (available from SGI)
PC with Red Hat Linux 6.0 (Linux 2.2.5)	GNU C++ (g++) distributed with Red Hat distribution. The command: <code>g++ -v</code> returns: gcc version egcs-2.91.66 19990314/Linux (ecgs-1.1.2 release)
PC with Windows NT/98/2000/SGI NT	Microsoft Visual C++ 6.0.

System Requirements for PCs

Minimum system requirements are:

- ♦ RAM:
 - 32 MB for DIS exercises
 - 64 MB for HLA federates



Depending on the size of your terrain databases, you may need more RAM.

-
- ♦ Hard disk space - Approximately 120 MB for complete installation of application and toolkit. Approximately 90 MB for application alone. Most of this is for the terrain databases shipped with VR-Forces. You may need considerably more space depending on the databases you plan to use.
 - ♦ Two or more multiples of the amount of RAM for virtual memory. Running VR-Forces in HLA may require increased amounts of virtual memory.

Network Compatibility

HLA only

VR-Forces 1.3 is built against VR-Link 3.6. This change makes VR-Forces compatible with:

- ♦ RPR-FOM 0.5, 0.7, 0.8, and 1.0
- ♦ MÄK Real-time RTI 1.3.3 and 1.3.3-ngc
- ♦ DMSO RTI 1.3v4 or later, RTI NG v1, v2, v3.0, v3.2.

VR-Forces 1.3 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 1.3 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.

RPR FOM Versions Supported

VR-Forces 1.3 has built-in support for versions 0.5, 0.7, 0.8, and 1.0 of the RPR FOM. It also supports VR-Link's ability to support alternative FOMs through the FOM Mapper. By default, VR-Forces 1.3 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 (0.5, 0.7, or 0.8) 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-Link08", "MyApp", new DtRprFomMapper(0.8));
```

RTI Support

The DMSO RTI NG-compatible version of VR-Forces 1.3 comes with a version of the MÄK Real-time RTI 1.3.3 that is link-compatible with DMSO RTI NG (makRti1.3.3-ngc). VR-Forces 1.3-ngc has been tested with DMSO RTI NG v1, v2, v3.0, and v3.2.

The non-NG-compatible version of VR-Forces 1.3 comes with a version of the MÄK Real-time RTI 1.3.3 that is link-compatible with DMSO RTI 1.3 v4 or later (makRti1.3.3). This release has been tested with those DMSO RTI 1.3 releases.

VR-Forces 1.3 may work with older versions of the MÄK Real-time RTI, but we recommend using it with release 1.3.3.

When using the MÄK Real-time RTI, remember to make sure that VR-Forces can find your FED file, and optional *rid.mtl*, file by either putting them in the directory from which you are running, or by setting the environment variable RTI_CONFIG to the directory that contains them.

RTI Library Names

VR-Forces 1.3-ngc expects library names that match those of DMSO RTI NG v3.2. If you run VR-Forces 1.3-ngc with DMSO RTI NG v3.2, both the UNIX and PC versions work without any modification. If you want to run VR-Forces 1.3-ngc with DMSO RTI NG v1 or v2, you must make the following changes:

- ♦ For UNIX, you must use the libraries *libRTI-NGv2.so* or *libRTI-NGv1.so*, which are supplied by MÄK in the *.lib* directory. These libraries correspond to DMSO RTI NG v1 and v2. To use VR-Forces 1.3-ngc with RTI NG v1 or v2, copy the appropriate library to the DMSO RTI NG *lib* directory and rename it *libRTI-NG.so*. (You might want to rename the v3.x *libRTI-NG.so* library first.)
- ♦ For PCs, rename the libraries that come with RTI NG v1 or v2 to the names used by the RTI NG v3.2 libraries (*libRTI-NG.lib* and *libfedtime.lib*).

New features

This release of VR-Forces has the following new features:

- ♦ The VR-Forces toolkit uses factories to create conditional expressions and statements.
- ♦ The Simulation View window displays the frame rate in the status bar.
- ♦ Entities can move in reverse.
- ♦ Greater flexibility for plug-ins.
- ♦ Ability to automatically respond to HLA synchronization points.
- ♦ The maximum number of formation members has increased from 4 to 10.
- ♦ Updated VR-Forces Developer's Guide.

Synchronization Points

The HLA version of VR-Forces will automatically respond when a synchronization point is announced to it by the RTI. VR-Forces will immediately indicate that it has achieved the synchronization point, so that it will not hold up the federation execution.

Greater Flexibility for VR-Forces Plug-Ins

Previous versions of the VR-Forces plug-in API allowed you to work only with entities, fire interactions, and detonate interactions in DIS. You were also restricted to using the classes contained in a *DtSimpleRprFomMapper* in HLA. Now you can do anything with the *DtExerciseConn* in the plug-in API that you can do using VR-Link.

Documentation Updates

This release has updated versions of the class hierarchy and header file documentation. *MÄK VR-Forces Developer's Guide* has been updated to describe new features that were included in VR-Forces release 1.2, but not documented, as well as new features in VR-Forces 1.3. This Release Note lists the updated and new sections.

The description of the plug-in API has been moved from *MÄK VR-Forces Developer's Guide* to *MÄK VR-Forces User's Guide*. The plug-in API is available to you whether or not you purchase the VR-Forces toolkit.

Updates to MÄK VR-Forces User's Guide

The following sections are miscellaneous updates to *MÄK VR-Forces User's Guide*.

License Key URL

The URL listed on page 2-14, step 3 of the license key procedure, is incorrect. The correct URL is www.mak.com/licenses.htm.

Skip Task

If a skip task is issued to an entity that is currently tasked as a subordinate, skip task is ignored.

Moving in Reverse

To have an entity move in reverse, assign it a negative speed.

Specification of the Entity Parameters Database in the Scenario File

Section 10-6 in *MÄK VR-Forces User's Guide* does not include discussion of the **Parameter-Database** parameter. You can use this parameter to specify an entity parameters database other than the default database.

```
(Parameter-Database  "..\data\parameters\myparameters.epd")
```

New Parameters in the Entity Parameters Database

Table 2 describes new parameters in the entity parameters database. Most of them are in the new descriptors - *DtGroundCollisionAvoidanceDescriptor*, *DtGroundMoveToDescriptor*, and *DtGroundFollowEntityDescriptor*, which are described in *MÄK VR-Forces Developer's Guide*.

Table 2: New parameters

Parameter	Description
at-distance	The distance, in meters, from a waypoint, at which an entity is considered to be 'at' the waypoint.
near-distance	The distance, in meters, from a waypoint, at which an entity is considered to be 'near' the waypoint.
passed-slow-down-factor	When following another entity, the factor by which an entity should slow its velocity when it has passed its desired offset position. Default: 0.1 times the speed of the followed entity.
near-catch-up-factor	The factor by which an entity should increase its speed when it is near its desired following position, but is not at that position. Default: 1.1 times the speed of followed entity.
far-catch-up-factor	The factor by which an entity should increase its speed when it is further away from the followed entity than the 'near' distance. Default: 1.25 times the speed of the followed entity.
approach-speed	The speed at which an entity should travel when it is 'near' a desired position. Default: 2.0 meters/second.
max-reverse-speed	The maximum speed at which a ground entity can move in reverse, in meters/second. Default: 10.0 (real number).

Updates and Additions to MÄK VR-Forces Developer's Guide

This section contains miscellaneous updates and a list of revised and new sections in *MÄK VR-Forces Developer's Guide*.

- ♦ Plan statements and conditional expressions now use standard factory mechanisms. Qualifying comments in the manual regarding use of factories for these objects have been removed.
- ♦ [Table 3](#) lists changes to component descriptor types.

Table 3: New component descriptor types

Controller	component-descriptor-type
turret acquire controller (page B-20)	turret-acquire-controller-descriptor
automotive ground collision avoidance controller (page B-24)	ground-collision-avoidance-descriptor
automotive ground move to controller (page B-25)	ground-move-to-descriptor
automotive ground follow entity controller (page B-26)	ground-follow-entity-descriptor
automotive ground patrol between points controller (page B-26)	ground-move-to-descriptor
automotive ground move along route controller (page B-25)	ground-move-to-descriptor
automotive ground patrol along route controller (page B-27)	ground-move-to-descriptor

- ♦ Ballistic guns have a new member function, `calculateMuzzlePosition()`.
- ♦ There are additional parameters for ground vehicle movement.
- ♦ The header file *prototdb.h* has been replaced by *terrainDB.h*, and the type `ProtoTypeTerrainDatabase` has been replaced by `DtTerrainDatabase` (these 2 changes go together).

Changes to VR-Forces Developer's Guide

The following sections of *VR-Forces Developer's Guide* have been updated:

- ♦ 5.1.10 `DtGroundAutoControllerComponent`
- ♦ 5.1.12 `DtGroundFollowEntityController`
- ♦ 5.1.13 `DtGroundMoveAlongControllerComponent`
- ♦ 5.1.14 `DtGroundMoveToControllerComponent`
- ♦ 5.1.15 `DtGroundPatrolBetweenController`
- ♦ 5.1.16 `DtGroundPatrolRouteController`.

Additions to VR-Forces Developer's Guide

The following sections have been added to *VR-Forces Developer's Guide*.

- ♦ 2.9 Managing Scenario Data from the Back-End

Local Entities

- ♦ 3.3.4 Fixed-Wing Entities
- ♦ 3.3.5 Rotary-Wing Entities
- ♦ 3.3.6 Missile Entities
- ♦ 3.6.9 Missile State Repository.

Descriptors

- ♦ 4.4.2 DtAzimuthMountComponentDescriptor
- ♦ 4.4.7 DtElevationMountComponentDescriptor
- ♦ 4.4.8 DtFixedWingActuatorDescriptor
- ♦ 4.4.9 DtFixedWingDefaultControllerDescriptor
- ♦ 4.4.10 DtFixedWingPilotControllerDescriptor
- ♦ 4.4.11 DtGroundCollisionAvoidanceDescriptor
- ♦ 4.4.12 DtGroundFollowEntityDescriptor
- ♦ 4.4.13 DtGroundMoveToDescriptor
- ♦ 4.4.14 DtLauncherActuatorDescriptor
- ♦ 4.4.15 DtRotaryWingActuatorDescriptor
- ♦ 4.4.17 DtTurretAcquireControllerDescriptor
- ♦ 4.4.20 DtWeaponActuatorDescriptor
- ♦ 4.4.21 DtWeaponControllerDescriptor.

Actuators

- ♦ 4.2.4 DtFixedWingActuatorComponent
- ♦ 4.2.5 DtLauncherActuator
- ♦ 4.2.6 DtMissileCollisionActuator
- ♦ 4.2.7 DtMissileManeuverActComponent
- ♦ 4.2.8 DtMountingAzimuthActuator
- ♦ 4.2.9 DtMountingElevationActuator
- ♦ 4.2.12 DtRotaryWingActuatorComponent
- ♦ 4.2.14 DtWeaponActuator
- ♦ 4.2.15 Example of Creating An Actuator.

Controllers

- ♦ 5.1.2 DtAirVehicleSetController
- ♦ 5.1.4 DtFixedWingDefaultController
- ♦ 5.1.5 DtFixedWingMoveAlongController
- ♦ 5.1.6 DtFixedWingMoveToController
- ♦ 5.1.7 DtFixedWingPatrolBetweenController
- ♦ 5.1.8 DtFixedWingPatrolRouteController
- ♦ 5.1.9 DtFixedWingPilotController
- ♦ 5.1.17 DtLauncherController
- ♦ 5.1.19 DtMissileControllerComponent
- ♦ 5.1.20 DtMissileMoveToControllerComponent
- ♦ 5.1.21 DtMissileTrackEntityController
- ♦ 5.1.22 DtMountingController
- ♦ 5.1.28 DtRotaryWingCollisionAvoidanceController
- ♦ 5.1.29 DtRotaryWingFollowEntityController
- ♦ 5.1.30 DtRotaryWingMoveAlongControllerComponent
- ♦ 5.1.31 DtRotaryWingMoveToControllerComponent
- ♦ 5.1.32 DtRotaryWingPatrolBetweenController
- ♦ 5.1.33 DtRotaryWingPatrolRouteController
- ♦ 5.1.34 DtRotaryWingWaitController
- ♦ 5.1.35 DTSimpleRotaryWingPilot.
- ♦ 5.1.40 DtWeaponController

Port Interfaces

- ♦ 6.2.2 DtAzimuthMountPortInterface
- ♦ 6.2.4 DtElevationMountPortInterface
- ♦ 6.2.5 DtFixedWingPortInterface
- ♦ 6.2.6 DtLauncherActuatorPortInterface
- ♦ 6.2.7 DtMissileManeuverActPortIntf
- ♦ 6.2.8 DtRotaryWingPortInterface
- ♦ 6.2.11 DtWeaponPortInterface.

Assume Tasks

The following sections are added to section 10.3.10, “Assume Tasks.”

- ♦ DtAssumeMoveToTask
- ♦ DtAssumeWaitTask
- ♦ DtAssumeWaitDurationTask
- ♦ DtAssumeWaitElapsedTask.

Known Problems

VR-Forces Release 1.3 has the following known problems:

- ♦ If you open a scenario that uses a DTED terrain file (for example, *montydted.gdb*), and you give an entity a movement task, the behavior of the entity becomes erratic. This behavior also occurs with the *world.gdb* database.
- ♦ When you close a scenario, if you click Yes on the prompt to save the scenario, it is possible that large scenarios may not be completely saved.
- ♦ The Go To Next and Go To Previous options on the Map Navigation menu don't work with aggregates. If you have a mixture of aggregates and individual entities, using these menu options works fine if there is a series of contiguously listed individual entities. Once the selection moves to an aggregate (11:1:0 ...) the entity list window loses a selection and the view in the Simulation View window doesn't change.
- ♦ Aggregates composed of fixed-wing entities do not carry out tasks as an aggregate. This is because the Follow Entity task is not implemented for fixed-wing entities.
- ♦ When you create a When statement, it may have the syntax "do Replace" in the statement until you save the plan. This does not affect the plan.
- ♦ When you create a When or If statement that tests for the condition of an aggregate being destroyed, the condition never evaluates to true, even if all of the members in the aggregate get destroyed.
- ♦ If you are using VR-Forces on a multi-processor computer, set the affinity to single-processor. VR-Forces does not currently take advantage of multiple processors.
- ♦ Missiles that are destroyed do not detonate.
- ♦ The header file comments for the `DtMissileEntity::place()` function are incorrect. The header file indicates that the version of the `place()` function that takes a `DtVector&` location argument positions the missile on the ground, keeping its current heading. The `place()` function actually positions the missile at the (X, Y) coordinates given by the location, and a Z coordinate of 1000 meters. All versions of the `place()` function reposition the missile in Z to 1000 meters, regardless of whether or not they have the location specified as an explicit argument.
- ♦ The string returned by `DtSimRemoteEntity::name()` will not always be correct for entities simulated by remote VR-Forces applications. Only top-level individual remote entities (entities whose superior is a force-level superior) will return the correct name string.
- ♦ 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.

- ♦ When you run the HLA/RPR version of VR-Forces, one or more 'phantom' aggregate entity HLA objects may appear on the network (corresponding to one for each force type simulated by VR-Forces). They have an entity type of all zeros, and should be ignored. Do not confuse them with the aggregate HLA entities associated with pseudo-aggregate entities created through the GUI. These aggregate entities have complete network representations, including a valid entity type.
- ♦ The Patrol Along Route task does not work for fixed-wing or rotary-wing entities.

Any previously reported problems that are not in this list have been fixed.