



VR-Engage 2.2 Release Notes

This release note contains release-specific information for VR-Engage 2.2, which is compatible with VR-Forces 5.2d.

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Systems Supported and System Requirements

For information about platform and system support, see the Product Specifications & Dependencies page on the MAK website at: <https://www.mak.com/mak-one-specs>. You can also find them in the Third-Party Licenses section of the Preface in the user guide and help.

For hardware requirements, visit <https://www.mak.com/mak-one/support/help> and click the Hardware Requirements link.

Compiler Compatibility on Windows

MAK provides versions of product releases that have been compiled with different versions of Microsoft Visual C++. MAK ONE products built with VC++ 14 and later are binary compatible and will work together. When you run MAK ONE products together on the same computer, for example, VR-Vantage, we strongly recommend that you run versions compiled with the same compiler or binary compatible compilers.

MAK RTI HLA 4 binary file names conform to the SISO-REF-075 standard, which includes a compiler marker to specify the compiler version. This prevents HLA applications from loading binary files from non-compatible compilers. The MAK RTI HLA 4 libraries are built using the Video Studio 2017 compiler and use the vc141 compiler marker.

Disk Space Requirements

A full installation of VR-Engage requires approximately 18.0 GB of disk space and an additional 82 GB for the complete makData 19 package, including the supplemental data package.

The makData Package and Product Compatibility

VR-Engage 2.2 is built against VR-Vantage 3.2c, VR-Forces 5.2d, and VR-Link 5.10. They use the shared makData 19 package.

MAK applications can share the same data package. For instructions on installing the data, see "[The makData Package](#)" in the *VR-Engage Users Guide*.

 The MAK data package contains data that VR-Engage requires. See the *Installing VR-Engage* chapter of the users guide.

License Manager

VR-Engage 2.2 uses FLEXlm 11.17.1. You must install the license management software to run VR-Engage.

The MAK License Manager files are not part of the VR-Engage installer. You can download them from the MAK ONE Product Downloads page (<https://www.mak.com/mak-one-downloads>).

Installation of the license manager is covered in the *MAK ONE Installation Guide*, available online at <https://mak.com/mak-one-installation-guide>. You can also contact your MAK distributor or use the [Support Portal](https://www.mak.com/mak-one/support/portal) at <https://www.mak.com/mak-one/support/portal> if you need assistance.

New Features and Updates

VR-Engage 2.2 has the following updates and new features:

- VR-Engage supports the new HLA 4 (IEEE HLA 1516-2025) interface specification.

User Interface

- There is now a text chat feature in VR-Engage and also VR-Forces, which allows players to communicate with each other and an instructor to communicate with players. For details, see "Text Chat" in the *Common Player and Entity Features* chapter of the help or *VR-Engage User Guide*.

Entity-Specific Changes

Human Characters

- Players can now walk up to vehicles and embark into the Driver role while using a VR headset. For vehicles with modeled interiors, the player can look around, and the gauges display only when the player's gaze is close to the default driver view.

Ground Vehicles

- There are improved movement behaviors and appearance of ground vehicles while driving, which were enabled by setting more accurate parameters, such as: center of mass, tire radius, tire width, wheel positions, slip threshold, front/rear-wheel steering, torque, and braking torque tables.
- The VR-Engage SMS includes new vehicles. The vehicles include: BMP-3 AFV, LAV 6 ISC, Leopard 2A4, Light Strike Vehicle MK II (LSV), MSVS SMP Gun Tractor. See the *Controllable Entities* chapter of the help or *VR-Engage User Guide* to see the available roles and sub-roles.
- The LSV vehicle has some specialized roles:
 - The Drone Operator can deploy and control the drone from the vehicle, even when the LSV is moving.
 - The Primary Gunner has three sub-roles for the different possible guns. One is for a Spike missile launcher, which the player can aim manually or specify indirect fire using MGRS coordinates. For details, see the "Gunner Role" section in the *Controlling Ground Vehicles* chapter of the help or user guide.
- The M777 Howitzer is now towable. Note that it is not configured for players to control.

- Added the differential lock functionality to the MRAP M-ATV and M1278 L-ATV-HGC (JLTV). Players can enable and disable this using the Action Menu. Refer to the *Controlling Ground Vehicles* chapter in the help or user guide to learn how to use the differential lock.

Aircraft

- There are new drone aircraft that you can control: DJI 200 Quadcopter, DJI Mavic 3 Small Munition, Flare Rapider 4 Quadcopter, Parrot Anafi Quadcopter. The new LSV also includes a drone operator role where the player can deploy and operate a quadcopter. These entities use a first-person view while the player operates the drone. See the chapter on *Controlling Drones* in the help or user guide.

Configuration

- You can now edit some Vortex parameters in the Simulation Object Editor with the VR-Engage extensions. For more information, see the "Ground Vehicles and Vortex" section in the *Adding and Editing VR-Engage Entity Models* chapter of the VR-Engage help or user guide.
- VR-Engage now sets the origin point based on the position of Vortex entities. When you load an existing scenario that includes Vortex vehicle entities, the origin is at the average position of all Vortex entities. When you create a new scenario or load one that does not include any Vortex entities, the origin is set at the position where you initially place the first Vortex entity. (The origin no longer defaults to Honolulu, Hawaii, U.S.A.) This improves load times for Vortex vehicles. This particularly improves performance for scenarios with many Vortex entities.
- VR-Engage can now drive a non-VR-Vantage external display application using CIGI. This enables you to use other IGs to display the actions occurring in VR-Engage. See the appendix on *VR-Engage Support for CIGI* in the VR-Engage help or user guide.
- Added support for XInput controllers.

Installation

- Updated the name of the executable that installs the plug-ins to use "extensions" instead of "add-ons". Also added the VR-Engage and VR-Forces versions to the executable to make it explicit which versions of the applications it supports.
- The VR-Engage installer now includes content creation tools: *simTreesTool.exe*, *medfTool.exe*, *mftTool.exe*, and the various *osgearth*.exe* utilities. To learn more about these tools and how to use them to manage terrain and model creation, please refer to the help or the *Adding Content to MAK ONE Applications Reference Manual*.

Startup

- You can now configure VR-Engage to start up a sim engine even when it joins a session hosted by VR-Forces or another instance of VR-Engage. This allows VR-Engage to create ownership entities that will exist on that sim engine and not the

hosting sim engine. For more information, see "Hosting an Entity in VR-Engage While Participating in a VR-Forces Session" in the chapter on *Running VR-Engage* in the help or *VR-Engage User Guide*.

- The new `--customSettingsFile` command-line option allows you to specify a settings file that you want to load to change startup configuration settings defined in the original *playerStation.lua* file. For more information, refer to that file.
- Instead of overriding all of the settings in the *playerStation.lua* file, you can use the new `--setting` command-line option to override a specific parameter in that file. For example, you can specify how VR-Engage connects to an existing simulation session. Refer to *playerStation.lua* for details.

API

- The VR-Engage SDK is now available and includes class documentation. Note that the SDK requires an installation code. For more information, contact your MAK distributor or use the [Support Portal](https://www.mak.com/mak-one/support/portal) at <https://www.mak.com/mak-one/support/portal>.

Documentation

- There are more details on configuring Vortex ground vehicles for use by VR-Engage players. Refer to the "Ground Vehicles and Vortex" section in the *Adding and Editing VR-Engage Entity Models* chapter of the help or *VR-Engage User Guide*.
- The new *Optimizing Performance* chapter in the VR-Engage help and user guide provides guidelines on how to improve the performance of VR-Engage for typical use cases.

Fixed Bugs

Table 1. Fixed Bugs

Key	Summary	Release Notes	Fix versions
ART-2776	None of the Harris terrains seem to be working	Deprecated the HarrisAfghanVillageFlatEarth.mtf, HarrisAfghanVillageFlatEarthMetaFlight.mtf, and Test-HarrisAfghanVillageUTM.mtf terrains. The first two terrains were available in the supplemental data package. (The HarrisAfghanVillageGeocentricMetaFlight.mtf and HarrisAfghanVillageFlatEarthMetaFlight.mtf terrains are still available and load as expected.)	VRV 3.1.1 VRF 5.1.1 VRE 2.1.1, VRV 3.2 VRF 5.2 VRE 2.2
ART-2784	Remove Nellis terrain from SupplementalData	Deprecated the Nellis.mtf terrain.	VRV 3.2 VRF 5.2 VRE 2.2
DIG-627	Aiming changes to character aren't applied if character is paused.	Aiming a paused character will now update aim to the requested aim angle without animating the aim.	DIG-IPB20, DIG-13.8
DIG-735	Reset scenario button doesn't reset chosen action.	Updated reset logic to re-select default action to avoid immediately resuming playback upon reset.	DIG-13.8
DIG-789	Content assist pop-up doesn't close when switching off of code editor window.	Fixed issue in the Character Viewer where the content assist pop-up was staying open when users exited the script editor	DIG-IPB20, DIG-13.8
DIG-894	Fix package naming and install location.	Updated the DI-Guy package naming conventions and default installation locations to be consistent with other MAK ONE products.	DIG-IPB20, DIG-13.7.1, DIG-13.8
DIG-926	Scrubber always disabled in CV	Logic for resetting the Active check box was interfering with normal operations. This is fixed.	DIG-IPB20, DIG-13.8
DIG-929	Texture Viewer doesn't show when selected from menu.	Fixed issue that would prevent the Texture Viewer from showing.	DIG-IPB20, DIG-13.8
DIG-971	M4 and M16 variants are all different sizes	The sizes of the M4 and M16 variants are now more in line with each other.	DIG-IPB20, DIG-13.8
DIG-1014	Alphabetical ordering in CV action list splits out capitalized actions differently.	The sorting in the Character Viewer Action list is no longer case sensitive and simply sorts alphanumerically.	DIG-13.8

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
DIG-1019	Update Content Reference Manual with instructions for customizing and setting up new hand items.	Added information to the DI-Guy Content Reference Manual. See the chapter on customizing content.	DIG-13.8
DIG-1045	Weapon aiming drifts to the side	Fixed issue preventing aim nodes from being placed under a 2D blend node.	DIG-13.8
VRE-2656	VR/MR - Clouds rotate with headset moving left/right	Fixed by enabling per-cloud billboarding in SilverLining.	VRE-2.2
VRE-2780	Lase location terrain intersection generates incorrect result	Fixed an issue that prevented aircraft entities from lasing a target location and then completing an air-to-ground attack on the lased location.	VRE-2.2
VRE-2869	Paratrooper M9 should not have an invisible parachute	When a player controlling the Paratrooper M9 entity deploys the parachute, they can now see the parachute that the entity is using.	VRE-2.2
VRE-2900	VR-Engage 4-Wheel Truck system doesn't display the gears	Corrected to ensure that gears such as D1 display correctly for specific truck entities. Previously, each forward drive gear displayed only D in the dashboard.	VRE-2.2
VRE-2942	Paratrooper does not have a backpack	The Paratrooper entity now has a parachute backpack, making its appearance more realistic.	VRE-2.2
VRE-3056	VR-Engage 25 mm gun config differs from VR-Forces	Added a target priority to munitions that was missing from the VR-Engage SMS. This allows VR-Engage entities equipped with this weapon to execute CGF tasks to fire it.	VRE-2.2
VRE-3143	Rename DtJoystickInputDevice class	Renamed to match the actual type. It is now sdlInputdevice.	VRE-2.2
VRE-3203	Time of Day out of sync when joining a session	Fixed this issue that occurred in connected, unhosted scenarios. They now start with the same fixed time.	VRE-2.2
VRE-3213	MFD PVD zoom doesn't work with touchscreens	Added mouse emulation for single point touch events.	VRE-2.2
VRE-3283	Crouching is being mapped to kneeling animation when weapon is stowed	The Kneeling posture has been removed for this release, ensuring that the correct animation is used.	VRE-2.2
VRE-3299	Wounded Carry - dragee animation is incorrect	Fixed issues with the wounded soldier's posture in the armpit drag position.	VRE-2.2
VRE-3316	Wounded Carry: Carried entities drop below terrain surface on Drop Injured	In some circumstances, there was an issue where performing one of the wounded carry actions and then choosing to Drop Injured caused the carried entity to be positioned below the terrain. This has been fixed.	VRE-2.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRE-3428	Consider static component type string in header	Removed type constructor. Added abstract type() function that all components must overwrite. Added new Type char* in header above classes for showing the type. Replaced all creator strings with Types.	VRE-2.2
VRE-3436	Remove SAR request capability from pilot role	SAR requests do not currently work in the pilot role, therefore the option has been removed.	VRE-2.2
VRE-3453	Emergency lights of police car are not working	Fixed issues that prevented the Police Cruiser vehicle's emergency lights from displaying properly when enabled. This was only a problem in DIS.	VRE-2.2
VRE-3458	Refactor state attribute mechanism	Improved attribute mechanism to resolve a number of issues.	VRE-2.2
VRE-3468	VR/MR - F8 key does not reset view inside Varjo headset	Updated Varjo SDK version to 4.10. You must also update the Varjo base application on your machines.	VRE-2.2
VRE-3502	Not all player component Lua parameters are discoverable	All available Lua configuration variables are now in the appropriate role files and are documented in those files.	VRE-2.2
VRE-3515	Refactor playerStation.lua and initSettingsFile	The command-line argument --initSettingsFile has been replaced with --customSettingsFile, which you can use to load your own settings file to override the startup configuration settings defined in the playerStation.lua file.	VRE-2.2
VRE-3534	Soldier floats in air when building it's on gets damaged	Fixed an issue that left lifeform entities floating when a building they were on was destroyed. Note that the scenario must be running; the entity does not die or fall when the scenario is paused.	VRE-2.2
VRE-3546	Helo door does not open during Fast Rope	Fixed the door on the Chinook to function the same as the one in VR-Forces. It now opens when embarked entities perform the Fast Rope Insertion task.	VRE-2.2
VRE-3568	Too easy to overlook changing Vortex DB origin	VR-Engage now sets the origin point based on the position of Vortex entities. When you load an existing scenario that includes Vortex vehicle entities, the origin is at the average position of all Vortex entities. When you create a new scenario or load one that does not include any Vortex entities, the origin is set at the position where you initially place the first Vortex entity. (The origin no longer defaults to Honolulu, Hawaii, U.S.A.)	VRE-2.2
VRE-3598	GTK Boxer APC has no ammo	Fixed the machine gunner role and changed the movement system to the new 8-wheel APC system.	VRE-2.2, VRE-2.1.1a

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRE-3603	Driver role with bad driver views	Fixed the driver views for the M1126 Stryker ICV with M2 and M270 MLRS.	VRE-2.2
VRE-3604	Commander/Commander Hatch Issues	On the M1A1 AIM (AUS) and M1A1 AIM (AUS) Mineplow, there is now only one choice for the Commander role. That role allows the player to do several actions, which are defined in meta-roles.	VRE-2.2
VRE-3605	Machine gun not working on M1A2 SEP Abrams	Fixed to allow players to rotate and fire the machine gun.	VRE-2.2
VRE-3620	Javelin launcher on tripod art parts should move when under player control	When a player rotates the missile launcher on the tripod, the launcher model now rotates to match the angle where the player has positioned it.	VRE-2.2
VRE-3628	Sim engine crash updating dynamic terrain object while paused	Added nullptr check to terrain producer, which can be called when the scenario is paused and a user creates a crater, berm, or ditch.	VRE-2.2, VRE-2.1.1a
VRE-3638	Repositioning Vortex entities too far on paged terrains fails	Added logic to ensure that users can place Vortex entities on paged terrain.	VRE-2.2, VRE-2.1.1a
VRE-3639	Unable to collide with non-Vortex entities	Fixed issue with the collisions between Vortex and non-Vortex entities.	VRE-2.2, VRE-2.1.1a
VRE-3640	VR-Engage sim engine crashes upon joining a session in HLA	Fixed an issue that could cause a crash when instances of VR-Engage joined in-progress scenarios using the HLA protocol.	VRE-2.2, VRE-2.1.1a
VRE-3652	Cannot specify FOM modules with spaces in the name	Fixed to enable command-line options to process FOM modules that have a space in the name.	VRE-2.2
VRE-3658	VR-Engage ground vehicles don't scale well	VR-Engage now sets the origin point based on the position of Vortex entities. When you load an existing scenario that includes Vortex vehicle entities, the origin is at the average position of all Vortex entities. When you create a new scenario or load one that does not include any Vortex entities, the origin is set at the position where you initially place the first Vortex entity. (The origin no longer defaults to Honolulu, Hawaii, U.S.A.) This improves load times for Vortex vehicles. This particularly improves performance for scenarios with many Vortex entities.	VRE-2.2
VRE-3664	Some VRE entities crash the SOE	Fixed issues with the VR-Engage extensions for the Simulation Object Editor.	VRE-2.2
VRE-3670	Role parameter overrides work only one level deep	The loadDefinition now goes more than one level deep, and it works with lists and tables.	VRE-2.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRE-3688	Attribute callbacks lack runtime flexibility	Added classes to the API and information to the player debug menu: - The DtAttributeHandle class avoids repeated lookup by string name. - The DtAttributeCallback class assures removal of callback when going out of scope. - New callback API can be used without knowing attribute type. - Attribute get/set/lookup statistics logged and shown in Shift+F4 Player Debug menu.	VRE-2.2
VRE-3698	Driver occupant is not shown/hidden correctly when player engages/disengages as driver	The HideOccupants extended data flag is now an override to the default entity display settings. There is now a third option to remove the HideOccupants extended data to return to the settings value. This allow applications such as VR-Engage to control whether the driver displays based on whether a player is engaged in the driver role.	VRE-2.2
VRE-3716	Sim crash when running VR-Engage connected scenario	Fixing threading error to prevent network "rubber-banding".	VRE-2.2
VRE-3728	VR-Engage configured vehicles don't use Gameware when under CGF control	Updated the movement systems for ground vehicles in VR-Engage. When controlled by CGF, they use the new type of ground movement implemented in VR-Forces 5.2.	VRE-2.2
VRE-3732	Threading crash in DtPlayerCreationPalette	Fixed a thread safety issue that could cause a crash when VR-Engage joined a session with multiple sim engines.	VRE-2.2
VRE-3733	Humans in sample scenarios are in T pose in the ground. Particularly the main humans.	If you experience issues with character appearance, upgrade your characters using a simple mapping table. The ./SharedData/19/latest/ModelData/Lifeforms/DIGuy/config/diguy/appearance_upgrade.cfg file contains these mappings. When you add an entry to the file, such as [old_appearance] = [new_appearance], any attempt to set [old_appearance] on an entity uses [new_appearance] instead.	VRE-2.2
VRE-3735	Double scope on XM107	The Australian Soldier with XM107 entity no longer shows both a 2D reticle overlay and a 3D model of the weapon while aiming. Only the 2D reticle overlay displays.	VRE-2.2
VRE-3738	VR-Engage's VR-Forces add-ons break route following	Updated the movement systems for ground vehicles in VR-Engage to the new type of ground movement.	VRE-2.2
VRE-3739	VR-Forces version compatibility needs to be more prominent	The VR-Engage extensions executable (formerly "add-ons") now includes the compatible version number for VR-Forces, for example, VRF5.2c-extensions.	VRE-2.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRE-3793	Gun unexpectedly swings upward when slewing the turret	Fixed to ensure that using the H and K keys to slew the turret results in expected behavior.	VRE-2.2
VRE-3804	Vortex movement parameters missing for a number of archetype systems	Generated the sysdef fragments for the Vortex-related parameters and integrated them into the sysdefs.	VRE-2.2
VRE-3814	3D models occasionally load with errors and are unable to move articulated parts	There is now one kinematic state object per element, rather than one per model set. This means there is one updater chain per element; all scene objects for active model sets of an element are updated by this chain. This resolves an issue with model instancing.	VRE-2.2
VRE-3817	Vortex sysdef generation tool should generate entire sysdef, not just a fragment	Introduced scripts and libraries for generating vortex mechanisms.	VRE-2.2
VRE-3832	Add command line argument to override individual item(s) in playerStation.lua	You can use the new --setting command-line option to override a specific parameter in the playerStation.lua file instead of overriding all of the settings in that file. For example, you can specify how VR-Engage connects to an existing simulation session. Refer to playerStation.lua for details.	VRE-2.2
VRE-3842	Flicker (maybe Z-buffer issue) when driving ground vehicles fast (above 75 km/h)	Updated the code now that VR-Vantage applications use reverse-Z by default. This fixes the issue with flicker.	VRE-2.2
VRE-3878	Using an aimingOffset in humanBase.lua can cause extra rotation on gun when looking around.	Fixed to ensure that the first-person model's offsets rotate properly.	VRE-2.2
VRE-3879	Enable VR-Engage to support starting a sim engine when joining another hosted session	You can now configure VR-Engage to start a sim engine even when it joins a session hosted by VR-Forces or another instance of VR-Engage. This allows VR-Engage to create ownership entities that will exist on that sim engine and not the hosting sim engine. For more information, see "Hosting an Entity in VR-Engage While Participating in a VR-Forces Session" in the chapter on Running VR-Engage in the help or VR-Engage User Guide.	VRE-2.2
VRE-3894	Fix DtVreGunJoyActutor::getFireResult to also take into account water	When VR-Engage sends the world position and orientation, the position now takes the dynamic ocean into account. Weapon fire effects now match correctly when the buoyancy model is enabled.	VRE-2.2
VRE-3899	Drone HUD missing Pitch, Reticle, Compass and Platform Info	Restored the pitch, reticle and crosshair, compass, and platform info to the drone camera view for civilian Spark quadcopter.	VRE-2.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRE-3942	M1A2 Tank Commander roles are inconsistent between the M1A2 SEP Abrams and M1A2 Abrams MBT	The name of the Commander Role on the M1A2 SEP Abrams was "Commander Hatch". It is now "Commander". Previously, the Commander role on the M1A2 SEP Abrams only allowed the user to look around. It now also enables the user to operate the machine gun.	VRE-2.2
VRE-3955	Ensure correct mapping of resources	When assigning resources to VR-Engage entities from VR-Forces, the names are now more human-readable than they were previously.	VRE-2.2
VRE-3977	Soldier_17 not kneeling when kneel posture chosen.	Removed the Kneeling posture for soldiers when controlled by human players. Players can only cause their human character to stand, crouch, or lie prone.	VRE-2.2
VRE-3993	Weapon sits to the side of wounded soldiers while dragged.	Hand items are no longer in the hands of the wounded entity or the character performing the Wounded Carry action (set to "no_weapon").	VRE-2.2
VRE-4000	Change default Vortex soil mapping for water surface types from "filter" to "Mud"	Updated Vortex Material mappings. This ensures that ground vehicles do not fall through the terrain when driving through areas with the Mud soil type.	VRE-2.2
VRE-4008	MRAP RPMs rev up and down when turning	Fixed issues that caused the HUD's tachometer to display erratic RPMs.	VRE-2.2
VRE-4016	XInput devices should be supported	Added support for XInput controllers.	VRE-2.2
VRE-4017	Change terminology from Add-ons to Extensions	Updated the name of the executable that installs the plug-ins to use "extensions" instead of "add-ons". Also added the VR-Engage and VR-Forces versions to the executable to make it explicit which versions of the applications it supports.	VRE-2.2
VRE-4019	Able to fire weapon while performing wounded-carry tasks	Players performing a Wounded Carry action can no longer fire weapons. The hands are occupied with carrying the wounded entity.	VRE-2.2
VRE-4023	1st person weapon placement out of sync from 3rd person	Fixed to ensure that the appearance of the weapon is the same for both first- and third-person views of human entities.	VRE-2.2
VRE-4030	Intermittent Vortex crash on shutdown	Fixed an issue that caused a Vortex crash when users exited VR-Engage.	VRE-2.2
VRE-4035	Flash bang grenade's visual model of the grenade is not visible when thrown	Updated the grenade LODs. When a player throws a flash bang grenade, the visual model is visible throughout the throw and until it detonates.	VRE-2.2
VRE-4060	Inconsistencies when driving M1083 MTV Cargo Trucks	Due to issues that arose with the M1083 MTV Cargo Truck w/ trailer entity, it was removed from the ground vehicles configured for VR-Engage.	VRE-2.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRE-4083	VR/MR - F8 recalibrate headset not working for humans	Fixed to allow people to use the F8 key to recalibrate an HMD for the human role.	VRE-2.2
VRE-4103	Green smoke grenade's visual model disappears partway through throw	When a player throws a green smoke grenade, the visual model remains visible until it detonates.	VRE-2.2
VRE-4108	Dead zone when using steering wheel	Improved the configuration of the supported racing wheel controllers, Logitech G27 and G29.	VRE-2.2
VRE-4131	North Reference on Action Menu does not update state	Fixed to allow users to change the North Reference using the Action menu. It no longer always displays as true.	VRE-2.2
VRE-4132	Javelin - Cannot select target using the Left Alt key, so can't fire weapon	The keyboard control for selecting a target with the Javelin launcher is now the T key.	VRE-2.2
VRE-4147	Change saved views observer mode from Stealth to Out-the-Window	Improved the process of engaging in roles by not switching from Out-the-Window (the default for the Choose Role screen) to Stealth (the previous default for roles). The observer mode is now consistently Out-The-Window.	VRE-2.2
VRE-4148	Shoulder-mounted javelin actions stop working after Esc-Esc	Fixed an issue that occurred when a Javelin player pressed Esc to go to the Application Menu after using the CLU to aim and then pressed Esc again to return to the role. If the user does this, the Javelin continues to work as expected.	VRE-2.2
VRE-4155	Wheels on M2A3 Bradley do not move up/down over bumpy terrain	Fixed the wheels to ensure they articulate when driving over uneven terrain. The wheels on the tank go up and down.	VRE-2.2
VRE-4156	Civilian Female/Male and Police Officer with Drone: Ensure users can control either drone or human, not both at once	The default controls for the Civilian Female with Drone, Civilian Male with Drone, and Police Officer with Drone have changed. When the drone is deployed, the player must choose whether to control the human or the drone. They cannot simultaneously control one with the keyboard and the other with a game controller.	VRE-2.2
VRE-4157	ACV - Driver View does not follow vehicle pitch - stays static in relation to vehicle	When in the driver role of the Amphibious Combat Vehicle, the view now moves with the vehicle. When moving over uneven terrain, the driver's view now bounces to match the vehicle's movement.	VRE-2.2, VRE-IITSEC2025

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRE-4267	Vehicles with only driver embarkation slot don't show up in proximity menu	Fixed to display the Action menu for the vehicle when players in a dismounted human role walk up to a vehicle configured with only a driver embarkation slot. They can then choose to embark in that slot. This was only an issue for ground vehicles that had no other embarkation slots than driver; it did not apply to vehicles that also had passenger slots.	VRE-2.2
VRE-4274	Change default 3D observer mode from Stealth to Out-the-Window	The default observer mode is now Out-the-Window, which matches that for most roles. If you use Admin mode to change Observer Settings, such as enabling Dust Clouds and Vehicle Tracks, those settings are now made to the out-the-window observer mode and therefore are reflected when you engage in a player role.	VRE-2.2
VRV-2260	Vantages crashes when CIGI component controls try to set values on Entities with no model / model failed to load	Fixed an issue that occurred when a third-party tool using CIGI had any invalid entity mappings and would therefore send Component Control messages for those entities.	VRV-3.2
VRV-3586	Dialog boxes should be (more) resizable	Added the scrollbar capability to the Display Settings dialog box. Pages with many options now allow you to scroll through the options, rather than making the page too large for normal computer screens.	VRV-3.2
VRV-4761	Heads wiggle when weight is increased	Fixed issue where body weight scaling was applied to LODs that don't support it.	VRV-3.2
VRV-4907	Mouse over symbol decoration settings are not selected when always on check box is selected	When you select the On/Off check box to indicate that the label should display regardless of the mouse cursor's position, the On Mouse Over check box is now disabled.	VRV-3.2
VRV-4933	There's a distance between Ocean Spray and Wave Splash where neither visual works	Specified minimum and maximum intensity levels to ensure that the effects display well.	VRV-3.2
VRV-4967	DtEntityEmitterVolumeVisualizer continually calls removeModel on scene objects, even when it doesn't need to	Fixed by refactoring the code.	VRV-3.2
VRV-5011	MGRS grid lines do not respect fixed spacing option	Implemented fixed spacing for MGRS map sheets.	VRV-3.2
VRV-5039	Procedural airport displaced threshold graphics & lighting incorrect	Corrected the displaced threshold lights and the end lights for the opposite runway.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-5068	Can't deselect element definitions	Fixed to allow users to deselect element definitions. Previously, if they selected any definition, they could not return the element editor to state where nothing was selected	VRV-3.2
VRV-5072	No 'session' backup for element definitions	Made improvements to the way in which the application restores to start up settings.	VRV-3.2
VRV-5151	Multiple power towers in some locations	Third-party fix in osgEarth.	VRV-3.2
VRV-5238	Vehicle entities noticeably stall the main thread when loading	Some indirect GPU buffers are now updated in chunks rather than all at once, which improves GPU-OpenGL driver interaction. Added a creator class for DtIndirectModelInfo in the API.	VRV-3.2
VRV-5259	DI-Guy logging output doesn't go to log file.	Fixed to ensure that, when DI-Guy logging is enabled, it is printed to the log file. Previously, it only displayed in the console.	VRV-3.2
VRV-5314	Frame drops in VRV - caused by a suspicious boost mutex	Refactored application code to be more thread-safe.	VRV-3.2, VRV-3.1.1d
VRV-5365	There are several issues with threshold and end lights	The edge lights behind the displaced threshold are now unidirectional red and placed in the DTHR light group. The end lights behind the displaced threshold are now omnidirectional red lights placed in the opposite runways END light group.	VRV-3.2
VRV-5394	Not able to override the DtOverWaterUpdater	Added a creator class for DtOverWaterUpdater, which DtSurfaceClampingUpdater now uses. This is to allow developers a way to implement better water to ground clamping.	VRV-3.2
VRV-5399	Bushes and trees are not affected by shadows when viewed at a distance	Restored self-shadowing on vegetation with low LODs. (Previously, for performance reasons, there was a change to disable self-shadowing on vegetation with low LODs. Since that time, vegetation fidelity has improved and it is no longer an issue.)	VRV-3.2, VRV-3.1.1b
VRV-5408	Crash when selecting draw bounding volume in Terrain Information Panel	Updated for cast safety.	VRV-3.2
VRV-5412	Go To Location Panel should follow Display Units Settings	The Go To Location Panel now allows you to use any of the supported coordinate systems.	VRV-3.2
VRV-5472	VR-Vantage applications should not ignore published parts not in the model	The observer can now attach to articulated parts that have been set by the network but do not exist in the model's scene graph.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-5514	Move the numberFomModules in the HLA 1516 Evolved.DtHla1516eDriver to the top	In the HLA 1516e connection XML file, the numberFomModules item is now at the top. When you add a new FOM, you must increment that value. Placing it at the top of the file makes it easier to remember to update the value.	VRV-3.2
VRV-5543	exampleSensorSetting key controls not fully working	Included a startup script for Linux. Updated the example's documentation to address some nuances about certain sensor settings.	VRV-3.2
VRV-5545	Restoring sensor setting to factory defaults will cause SensorFX scenes to render all white.	Fixed an issue where the wrong sensor settings were applied, which occurred because the active sensor was tracked incorrectly during a factory reset.	VRV-3.2, VRV-3.1.1g
VRV-5585	Symbol decoration settings don't work with example tactical graphics	Fixed to ensure that the symbol decoration settings apply to the tactical graphics example.	VRV-3.2
VRV-5588	Debug Visuals - Debug Texture does not reload	Fixed by adding a status to check for when the user loads a texture. This status allows the logic to display the debugging texture virtual program regardless of whether the texture was newly loaded or pulled from the memory cache.	VRV-3.2
VRV-5654	ModRad still writes to Shared Data	Updated to have ModTran output to a SensorFX cache directory.	VRV-3.2
VRV-5668	DtLineIndicatorSymbolDecorationUpdater does not check for active model set	The application now updates only when the model set is active.	VRV-3.2
VRV-5675	SensorFX automatic gain changes should not be instantaneous	Fixed to make the rate of gain changes slower and therefore more realistic.	VRV-3.2
VRV-5707	Entities are very slow to appear in SensorFX	Fixed the compounding issues that caused long delays before an entity would be visible in SensorFX views.	VRV-3.2, VRV-3.1.1g
VRV-5727	Loading Yemen CDB is slower than before	This is fixed by the improvements to loading CDB terrains.	VRV-3.2
VRV-5781	VR/MR - SensorFX Speedtree shaders need reviewing for multiview VR	Updated multiview implementation to support passing on viewVertex.	VRV-3.2
VRV-5785	Elevation road flattening is broken	Restored OSG Earth configuration for road flattening on hilly terrains.	VRV-3.2
VRV-5789	Crash when changing Window Type to Fullscreen while in Plan View mode	Fixed issues with texture bookkeeping.	VRV-3.2, VRV-3.1.1n
VRV-5807	Approach lights name missing in debug at Heathrow Airport	Fixed a typo to ensure that names of approach lights display in the Developer Debug Overlay.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-5811	Warning: makVrv::DtIndirectGeometryCallback::processLayer	Refactored some code in DtIndirectGeometryCallback to account for non-opened layers, which are layers that are in the earth file but disabled. They are no longer added to the indirect management system unless they are opened.	VRV-3.2
VRV-5827	Tactical Graphic Vertex Selection and Hover Events Broken	Fixed issues with the events related to selecting and hovering over vertices.	VRV-3.2
VRV-5830	FBX external reference not working when converted to MEDF	Fixed the node comment to ensure that external references work with the medfTool to convert to MEDF (MAK Encrypted Data Format).	VRV-3.2
VRV-5838	Dynamic lights on entities not working	Fixed to reenable dynamic lighting on entities.	VRV-3.2
VRV-5865	VR-Vantage with shadows enabled can generate OpenGL errors in the indirect system	Improved the logic to ensure the indirect GPU culling buffers are only updated once per frame. This change prevents camera staging buffers from getting out of sync with the GPU buffers.	VRV-3.2
VRV-5877	FBX Loader does not support End of Barrel Comment	Added an empty degree-of-freedom (DOF) node when the comment "@dis annotation end_of_barrel" is present.	VRV-3.2
VRV-5887	Intervisibility Fans do not display the expected outer blue ring except in Plan View	Fixed to ensure that the outer circle displays for intervisibility fans.	VRV-3.2
VRV-5888	Dynamic Lights on HNL Airport terminal are non-functional	Fixed to enable dynamic lighting at Honolulu airport in MAK ONE terrains.	VRV-3.2
VRV-5889	Rotary wing entities can sometimes stop animating in the raid demo scenario	Fixed an issue that arose when an entity with rotor blades spinning at full speed moved between grids. The rotory velocity updates are now received, ensuring that the blade animation continues as expected.	VRV-3.2
VRV-5897	SensorFX: Changing the Current Time while in a SensorFX view may cause the screen to flicker repeatedly	Fixed a flicker that could occur in SensorFX views, which was caused by processing entity thermal hot spots in a parallel thread.	VRV-3.2, VRV-3.1.1a
VRV-5900	DI-Guy characters are not appearing in SensorFX modes unless the observer is extremely close to the entity	Fixed issue where some DI-Guy LODs, primarily lower LODs, did not appear when using a SensorFX observer mode.	VRV-3.2, VRV-3.1.1c
VRV-5916	SensorFX: Entities do not visually cool off after turning off their power plant	Fixed issue where entity's active regions would not visually cool off after being activated.	VRV-3.2, VRV-3.1.1o
VRV-5936	CameraFX: Night vision is very blurry and noisy	Updated the default settings for NVG (CameraFX) observer mode.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-5958	Crash when closing map - BiomeLayer tracker token	Fixed in makOsgEarth.	VRV-3.2, VRV-3.1.1b
VRV-5962	Ground clamping updaters are created if no clamp mode is specified in the element definition	The default allowed clamp mode is now clampNone. No ground clamping updater will be created unless a clamp mode is set in data for that element.	VRV-3.2
VRV-5975	Example customShaders documentation does not appear in the online documentation	Add exampleCustomShaders to the page that lists Graphics examples.	VRV-3.2
VRV-5977	exampleEffectTexturePlugin should use available model	Updated the model and texture used in this example to ones in the current MAK ONE data package.	VRV-3.2
VRV-5981	exampleSymbolFacade broken	The DtWidgetLabel objects created by exampleSymbolFacade now use the ConstrainToBounds size policy, because it is not setting a test string on the label. It relies on a specific set size onto which it renders a texture, not determining a size based on a text string.	VRV-3.2, VRV-3.1.1b
VRV-5984	SensorFX: Multiple channels configured with different SensorFX sensors do not display correctly	Fixed to display the correct sensors when multiple sensors are in use, each in a different channel. Previously, data was generated for a single type of sensor even when different ones were set to display.	VRV-3.2, VRV-3.1.1a
VRV-5987	VR-Vantage loads lower LOD tiles when changing from Stealth to Plan View	Fixed by changing the 2D cull altitude.	VRV-3.2
VRV-5997	DtIndirectSwitchManager::updateSwitches() is very slow	Optimized DtIndirectSwitchManager::updateSwitches() to utilize multithreading, which improves performance.	VRV-3.2, VRV-3.1.1d
VRV-6010	Ship and boat propeller wash wakes stop rendering due to application-wide limit on the number of propeller wash wakes and it is not obvious that the limit is being exceeded	There is now debug information in the Developer Debug Overlay under Ocean Settings where users can see the max prop wash setting.	VRV-3.2
VRV-6017	GARS fixed spacing broken	Corrected to properly convert the degrees to radians when rendering the GARS grid lines.	VRV-3.2
VRV-6020	Tactical graphic embarkation on aggregates does not work	Fixed to ensure that users can attach tactical graphics to units in VR-Forces.	VRV-3.2
VRV-6025	Add command-line argument to turn off GL buffer tracking	The new --disableGIBufferTracking command-line options turns off GL buffer tracking, which can improve performance in cases such as CDB.	VRV-3.2, VRV-3.1.1b

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6026	Add shared locks to DtReadFileCallback	Added shared locks so that reads do not block each other. This improves how the application handles CDB terrains.	VRV-3.2, VRV-3.1.1b
VRV-6027	Use shared locks in indirect containers so that reads do not block other reads	This change improves performance on CDB terrains.	VRV-3.2, VRV-3.1.1b
VRV-6029	Stop CDB from adding indirect models in the main thread because it causes stalls	Made improvements for CDB performance.	VRV-3.2, VRV-3.1.1b
VRV-6030	Procedural height map issue	Fixed in third-party software.	VRV-3.2
VRV-6034	Handle the case when articulated parts stop being published by an entity	Removal of art. parts now removes pose overrides from DI-Guy characters, returning them to their expected pose.	VRV-3.2
VRV-6036	Enabling "Omit Overlays - 32bit floating point" on a video stream causes the image to take on a greenish-yellow tint	Fixed to render into RGB.	VRV-3.2, VRV-3.1.1a
VRV-6038	Reconnecting an RDE causes a crash	Fixed the remote display engine (RDE) to ensure that, on reset, it clears the queue of items the RDE had not processed when it disconnected.	VRV-3.2, VRV-3.1.1a
VRV-6039	Disconnecting an RDE can sometimes crash with overlay widgets present	Fixed the remote display engine to prevent classes from trying to access freed (invalid) objects, which caused the crash.	VRV-3.2, VRV-3.1.1a
VRV-6040	Reconnecting an RDE can sometimes disable alpha to coverage	Fixed the indirect entity manager to ensure the global alpha to coverage (ATC) setting is applied correctly, even when the ATC settings change.	VRV-3.2
VRV-6041	Changing a channel's frustum causes shadows to render incorrectly	Updated the code that computes the near and far frustum points from the viewing camera frustum.	VRV-3.2
VRV-6042	Improved Mixed Reality mask anchoring	Added support to improve anchoring and alignment of masks in mixed reality mode for Varjo. There is a new option in the Developer Debug Overlay (accessed by pressing F4), VR Anchoring, where you can enable anchoring and interactive calibration of the tracking space. Refer to the help or the VR-Vantage Users Guide for more information.	VRV-3.2, VRV-3.1.1a
VRV-6051	Range line heading does not respect Application/Heading display unit setting on creation	Previously, when you drew a range line, it always displayed the heading as relative to true north, even when your settings were set to display headings as relative to either magnetic or grid north. This is fixed.	VRV-3.2, VRV-3.1.1b

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6055	Provide a way to completely remove the performance penalty for user input, such as keyboard/mouse events	When you define the NoExternalInput channel keyword for all active channels, the application no longer performs an event traversal of the scene graph. The event traversal and the event queue are no longer populated to begin with, making the application more efficient.	VRV-3.2, VRV-3.1.1b
VRV-6056	Use shared locks when looking up singleton instances rooted in the DtDe	Previously, looking up rooted singleton instances in the DtDe used a unique lock, preventing threads from doing lookups concurrently. Since no modifications are made to the lookup data structure, this is now a shared lock.	VRV-3.2, VRV-3.1.1b
VRV-6059	SpeedTrees are missing from Ala Moana inset when using SensorFX on Linux	Fixed SpeedTree shader compilation issue.	VRV-3.2, VRV-3.1.1a
VRV-6061	Software Patch letters are not being set in the About Box	Patch versions are now correctly reflected in the About dialog box.	VRV-3.2, VRV-3.1.1a
VRV-6062	Deselecting underwater visibility check box in weather dialog turns whole screen blue	Fixed an issue that caused the display problem.	VRV-3.2
VRV-6069	Dt3DEllipseVisualizer default physical line height getting overridden	Fixed by setting network values after visualizer values.	VRV-3.2
VRV-6072	Update decoding of geometry from METOC weather layers in HLA	Updated the decoding of the weather area information to ensure that it matches what is sent from VR-Forces.	VRV-3.2
VRV-6074	DtOsgWidgetLabel does not support altitude based scaling when using ConstrainToBounds policy	Updated to make use of the altitude-based scales when determining the sprite bounds for various altitude configurations.	VRV-3.2
VRV-6076	Starting in SFX sensor while loading terrain from command line can result in some sensorized objects not being rendered properly	Fixed an issue that was seen when starting in SAR mode while loading a terrain, which could result in the procedural ground not being set up with the correct shaders.	VRV-3.2, VRV-3.1.1b
VRV-6079	DtObserverAnimator is not easily extendable	Toolkit users can now more easily extend the DtObserverAnimator class and control whether or not it linearly interpolates from the start orientation to the end orientation.	VRV-3.2
VRV-6080	Minor orientation fluctuations cause change signals to fire constantly.	Updated with a better approach to prevent the Orientation Changed signal from firing in the case of minor rounding errors.	VRV-3.2
VRV-6081	SensorFX: Some placed entities are starting with parts like treads and weapons heated up	Fixed an issue where temperature data was not properly updated which could cause active regions to render with wrong temperatures.	VRV-3.2, VRV-3.1.1g

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6087	SensorFX: Section of terrain is very dark upon first terrain load with fresh install	Fixed intermittent shader linking errors that can occur when starting up SensorFX without a valid shader cache.	VRV-3.2
VRV-6093	Video Stream metadata Velocity value warning causes performance issue.	Removed velocity out-of-range warnings in favor of following the MISB ST 0601.8 spec. Set the velocity value to $-(2^{15})$ as an "out-of-range" indicator.	VRV-3.2, VRV-3.1.1c
VRV-6094	HAT line measurements should update when user changes the measurement in Display Settings	Made a change to update the measurements displayed for height-above-terrain (HAT) lines when the user changes Display Units Settings.	VRV-3.2, VRV-3.1.1d
VRV-6098	simTreesTool generating incorrect values for vegetation model bounding boxes	Fixed the simTreesTool so that, when it is used to generate the height and width of the non-sim engine model, the generated values are correct.	VRV-3.2
VRV-6100	cdbTool doesn't support cache directories not inside a vantage install	Use the new <code>-a --AppDataPath</code> command-line option to specify the directory to use for CDM XML mappings. The default value is <code>./appData</code> . See the help or the Adding Content to MAK ONE Applications Reference Manual to learn more about the cdbTool.	VRV-3.2, VRV-3.1.1e
VRV-6102	Gimbal sensor overlay does not show sensor azimuth correctly	Corrected the numbers that display the gimbal sensor's relative offset.	VRV-3.2
VRV-6109	Weather areas only affect a small area within the larger area	Fixed to use the METOC approach to weather, removing the previous system for processing incoming local weather data.	VRV-3.2
VRV-6110	CDB Bathymetry working with Camp Pend. but not with Yemen CDB	If you experience issues with the bathymetry in your CDB database, try the following alternative. Add the <code>no_data_value</code> and set it to 0. This acts as a mask in both the elevation and bathymetry datasets. Also, try placing the bathymetry information first in the earth file because the resolution is typically lower than the elevation. For an example, please refer to "Configuring the Elevation Dataset (001)" in the Adding Content to MAK ONE Applications Reference Manual.	VRV-3.2
VRV-6113	SensorFX: Procedural texture splatting stops working after shader reload	Fixed an issue that prevented Procedural Texture Splatting from functioning in SensorFX after a shader reload.	VRV-3.2, VRV-3.1.1d
VRV-6119	Water in sensor modes are not visible at higher altitudes	Updated the MCOD driver to make use of OSM water data, which allows the application to classify bodies of water as the water material system. Bodies of water are now more visible at higher altitudes where the MCOD EMAT textures are the only EMAT textures used.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6121	SensorFX: The material numbers in the documentation's Texture File Mapping table are incorrect	In the chapter Material Classification for SensorFX, the Material Classification Process Overview listed the material numbers as 1-6, but they are actually 0-5. The documentation has been corrected.	VRV-3.2
VRV-6125	Remove Entity State Object and Fire Interaction State Object and their related classes (dead code)	Removed state views and sim data from VR-Vantage. This code was previously used by VR-Forces, and it has been refactored to remove the need for this infrastructure. Refactored sensors' field of view to no longer use this infrastructure and instead use agents, which is more consistent with how MAK ONE products move information from the network thread to the main thread.	VRV-3.2
VRV-6127	Indirect rendering time budgets are not accurate when VSync or FPS limiting is enabled	Improved the application to wait on the GPU when doing time budgets for buffer updates. Also restored the proper FIFO order for items that need to stay in the queue. Added some additional GPU arena stats to the F2 ImGui stats to monitor behavior.	VRV-3.2, VRV-3.1.1d
VRV-6128	CDB models can randomly fail to load and be missing depending on hardware speed	Fixed the logic in DtGpuCulling::updateGpuBuffers that was previously returning false when it should have returned true to indicate more updates are required.	VRV-3.2, VRV-3.1.1d
VRV-6130	Switching between saved observer views with SensorFX enabled causes a memory leak	Fixed an issue where the texture buffer coordinates were not being recycled.	VRV-3.2, VRV-3.1.1d
VRV-6132	VRV Build System should be improved	Improved the way in which VR-Vantage is built and packaged.	VRV-3.2
VRV-6133	SensorFX: specifying land use textures does not work on osgEarth Terrains	The osgEarth image layers now use the correct shader.	VRV-3.2, VRV-3.1.1d
VRV-6154	SensorFX: Reduce latency caused by updating of inactive sensors	Optimized SensorFX processing when multiple sensors are configured. The system now performs work for only Sensors that actively in use.	VRV-3.2, VRV-3.1.1g
VRV-6155	CIGI HATHOT responses zero out when running single-threaded connection	Fixed an issue where users could see traffic between a CIGI host and VR-Vantage and the requests coming from VR-Vantage, but there was no valid response sent back to the host.	VRV-3.2, VRV-3.1.1d
VRV-6173	exampleWindowObjectHud does not set the window size correctly	Fixed the setting of the window size in exampleWindowObjectHud. Updated the example documentation to clarify what it does and why.	VRV-3.2
VRV-6189	MetaFlight terrain UTM/South Hemisphere not working	Fixed how the application handles MetaFlight terrains to correctly display UTM coordinates based on the UTM zone origin, not the terrain database offset.	VRV-3.2, VRV-3.1.1e

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6191	DtImageSymbolVisualizer can cause crash	Made code improvements to avoid the crash.	VRV-3.2, VRV-3.1.1e
VRV-6199	DtOsgEarthDynamicTerrainFeature uses hard-coded value for dynamic terrain LOD, making VR-Engage gunnery ineffective.	Added set/get for LOD, and use creator to allow applications (for example, VR-Engage) can override the settings.	VRV-3.2
VRV-6203	CDB Tool does not run successfully on Linux	Updated the tool to ensure that it runs on Linux machines.	VRV-3.2
VRV-6204	Wheels wobble severely in player-controlled ground vehicles	To improve visuals in VR-Engage, added code to detect manual and network updates to the orientation of articulated parts. When the application detects a manual or network update, the application disables internal auto-updates. When no manual or network updates have been applied for three seconds, the auto-updates resume.	VRV-3.2, VRV-3.1.1f
VRV-6206	Version header template file should not be shipped with VR-Vantage	The installer does not include the igVersion.h.in file. It's needed only for building.	VRV-3.2
VRV-6208	DtGarsCoordinateDisplay::convertToGeocentric Method is not implemented	Implemented the method to support the Last Clicked Location panel in VR-Forces.	VRV-3.2
VRV-6211	Apply shadows to ambient option should also apply to environment light	Updated the shaders to include environment light with the Apply Shadow to Ambient Lighting feature. Also made improvements to performance. The shader variable vrv_applyShadowToAmbientLighting is now in the range of 0.0 to 1.0 rather than -1.0 to 1.0.	VRV-3.2, VRV-3.1.1e
VRV-6219	Update / correct Add Feature Layer dialog box	Updated "Front-End" to "GUI" to follow new naming standard.	VRV-3.2
VRV-6227	Pausing MAK Data Logger with Enable Articulated Part Smoothing causes parts to continue moving linearly and rotationally	Fixed to ensure that art parts, such as wheels, remain in place when a Logger tape is paused.	VRV-3.2
VRV-6229	CIGI Entities do not respect application-wide Smooth settings	CIGI entities now respect the application-wide settings for smoothing.	VRV-3.2
VRV-6235	Add Terrain Patch with FBX causes VRV to crash	Modified the "vrvAppDataDir" used specifically for CDB, to instead be vrvCDBAppDataDir. This avoids the naming conflict between CDB and the FBX loader code paths.	VRV-3.2, VRV-3.1.1f
VRV-6239	VRV's network dialog can stop working if you filter unchanged network settings in the common connection configuration file	Added optional argument saveAllParameters to DtDriver to allow for more control over the behavior of the createConfiguration function.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6244	Occupants should animate	DI-Guy characters that are occupants of a vehicle can now perform animations.	VRV-3.2
VRV-6253	CIGI Attached View Orientation can get out of sync with the Attached Entity Position	Added infrastructure to the CIGI implementation to allow properties coming from the same CIGI frame to be applied in the same render frame.	VRV-3.2, VRV-3.1.1f
VRV-6263	Ground DB2 destructible buildings start with wrong state in VRF Sim	Added code to sort the order of the state nodes under the damage_ structure switch to account for terrains where they are not in the order expected by MAK ONE applications.	VRV-3.2
VRV-6269	Weather area ground fog does not fill entire area	Fixed to use the METOC approach to weather, removing the previous system for processing incoming local weather data.	VRV-3.2
VRV-6272	Crash in DtElementEditorLogic	Added a check to prevent the crash.	VRV-3.2, VRV-3.1.1g
VRV-6280	SensorFX - Once DI-Guy entities flickered unless the observer was extremely close to them	Fixed issue where DI-Guy characters becoming uninstanced would result in a one-frame pop.	VRV-3.2, VRV-3.1.1j
VRV-6282	Ground DB 2 runway lightpoints are not culling properly	Fixed in the code for indirect geometry bound box calculations.	VRV-3.2
VRV-6291	Non indirect entities can disappear with node visualization active	The application now marks the OSG shader state "dirty" after drawing lines/spheres from component system. Also improved/simplified some of the logic in DtSceneGraphTreeLogic class.	VRV-3.2
VRV-6296	RDEs crash when using CIGI View Control packets	The application now uses the observer object manager.	VRV-3.2, VRV-3.1.1h
VRV-6298	Error dialog spew when using CIGI that attaches observer to an object	Improved the logic in the application's attach manager to be more robust in how it detaches observers from objects that no longer exist.	VRV-3.2, VRV-3.1.1i
VRV-6305	If a user sets an appDataDir path, it is set too late to be caught by the DtApplicationSettingsManager	Fixed to ensure that the data files are loaded correctly when using this command-line option.	VRV-3.2
VRV-6307	resolveDots method in the DtVrfFilesystem.cxx messes with a valid windows path to make it invalid	Fixed an issue that occurred using the --appDataDir command-line option, where some file paths were not processed correctly.	VRV-3.2
VRV-6310	Sensor Control CIGI Packets causes constant file writes to the sensor configuration file even when no sensor properties have changed	The application will not signal that a sensor property has changed if it did not actually change.	VRV-3.2, VRV-3.1.1i

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6311	Remote graphics fill patterns broken	Fixed stippling for normalized screen space graphics (remote graphics, CIGI symbols, and so on). Updated the shaders to correctly calculate the UV coordinates, which are needed for normalized graphics.	VRV-3.2
VRV-6320	MAK Earth can sometimes load without grid labels	Updated the logic responsible for enforcing the use of grid types that are compatible with the application's current coordinate system.	VRV-3.2
VRV-6321	Animals sometimes don't show up unless selected	Fixed the setting for animal entity appearance when they are first placed. This was an issue for animal entities that have multiple appearances.	VRV-3.2
VRV-6325	CIGI reapplying sensor settings if a track mode is used	Added a separate signal for the view controller (a one-shot request) as opposed to the sensor controller (a request that can be processed every frame).	VRV-3.2, VRV-3.1.1j
VRV-6326	Entities can dead-reckon after stopping their movement.	Updated the listeners used to check for changes to simulation objects' velocities to ensure that the application promptly processes zero velocity values.	VRV-3.2
VRV-6332	VR-Vantage applications should print warning when UTF8 string is corrupt instead of throwing and (often) crashing application	Updated the code to change how the error is returned to prevent the crash.	VRV-3.2, VRV-3.1.1j
VRV-6335	CameraFx environment overrides not working	Fixed to ensure that the Entity Itensity Minimum value applies to indirect entities.	VRV-3.2, VRV-3.1.1j
VRV-6345	SensorFX - SpeedTrees render incorrectly in some multi-channel configurations.	Fixed issue where SensorFX shaders were not applied for SpeedTrees, Dynamic Ocean, Sky, and Clouds in some multi-channel configurations.	VRV-3.2, VRV-3.1.1k
VRV-6347	CIGI view controls get stuck to one entity when switching between entities	Fixed to enable VR-Vantage to reattach the same observer to another entity in the simulation.	VRV-3.2, VRV-3.1.1j
VRV-6351	Frustum based view magnification calculated incorrectly with default frustum	Corrected the calculation.	VRV-3.2, VRV-3.1.1j
VRV-6354	SensorFX - If multiple channels are active, switching to a SFX mode in one channel may cause buildings to disappear in the other	Fixed issue where the SensorFX texture sampler state was incorrectly set up for the Stealth view, thereby causing some draw operations to fail when using multiple observers.	VRV-3.2, VRV-3.1.1j
VRV-6360	Linux reporting erroneous Active Image Threads count in Developer Debug Overlay stats	Corrected a calculation to ensure the correct information displays.	VRV-3.2
VRV-6367	A slow memory leak occurs when leaving the program running at the Ala Moana inset	Made fixes to the particle system.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6374	Portions of a Radio Communication Line can be easily clipped out of the scene	Enabled depth clamping on 3D segmented lines. This prevents radio communications lines from being clipped when portions of the line are closer to the eyepoint than the computed near plane.	VRV-3.2
VRV-6385	CIGI HOT Requests have location drift	For HOT requests in geodetic, ignore altitude and use 100000.0 instead as the start point for the intersector.	VRV-3.2, VRV-3.1.1j
VRV-6386	Large number of CIGI python scripts broken	Corrected the mappings in the scripts to ensure they set frame numbers correctly.	VRV-3.2, VRV-3.1.1k
VRV-6391	Edit Element Definition context menu is broken	When you right-click on models in the window and choose Model Configuration > Edit Model Definition, the associated element definitions now display correctly. It looks for the entity element definitions directly, not the associated model definitions.	VRV-3.2
VRV-6396	Custom VR-Vantage apps crash on CIGI connection	Fixed by force registering the DtRenderSideCigiFrame agent creator.	VRV-3.2, VRV-3.1.1k
VRV-6398	Water On Screen post processor effect shaders do not reload when user clicks 'Reload Shaders' button in Render Settings	Updated DtWaterOnScreenDrawable and DtWaterOnScreenEffect to reload shaders.	VRV-3.2
VRV-6399	Local weather precipitation not working	Fixed to use the METOC approach to weather, removing the previous system for processing incoming local weather data.	VRV-3.2
VRV-6400	Entity Wheel Updater inefficiently searches for objects every update	The application now has a cache of wheeled articulated models after finding those objects. It also now inform the entity wheel updater when an object is destroyed so that it can clear its internal references and not reference the deleted object.	VRV-3.2
VRV-6402	Remove use of std::unary_function as it's deprecated in C++17	Removed the function.	VRV-3.2
VRV-6407	CIGI disconnecting and reconnecting breaks view control packets	Made fixes to code related to attachments.	VRV-3.2
VRV-6410	Test-HarrisAfghanVillageUTM has no visible terrain at its default "Afghan Village" view	GDAL now requires more information to define the projection. Modified the earth file to include the additional configuration.	VRV-3.2
VRV-6415	Loading the VirtualReality_prototype display engine configuration may crash if an additional window is already open	This crash could occur when VRV_GL_DEBUG was enabled. The application now ensures that OpenGL context is active before calling OpenGL commands specific to the debugger.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6440	VR-Vantage application fails to load some CDB buildings from certain terrains	Added a warning when CDB medf loads fail. This can occur if there is an error when caching the CDB terrain prior to loading.	VRV-3.2
VRV-6445	exampleSendDrawControl and exampleSendControl should have a local version of the DIS startup script	Added Linux startup scripts for running exampleSendControl and exampleSendDrawControl using the default DIS localhost configuration.	VRV-3.2
VRV-6450	Precipitation intensity is not interpreted correctly from the network	Adjusted the conversion from VR-Link to VR-Vantage applications for precipitation intensity values. The code now maps incoming 0 to 200 (in mm/hr) correctly to match needed values for VR-Vantage applications.	VRV-3.2
VRV-6463	Terrain Cache tool could use further improvement	- The title bar in the dialog box is now Generate Cache, matching the button text in the Terrain Editor Panel. - The tool now respects the values for Lowest and Highest LOD level. - Users can only generate a cache for an area, not the entire world. - The dialog box remains open while the tool generates the cache, displaying a progress bar. The user can cancel the caching process. - The progress bar provides a more accurate estimate of the percentage complete. - Cache coordinates map to axis aligned geodetic coordinates, and the tool respects any repositioning of the observer. - The tool's performance has been improved, allowing the cache to complete more quickly. - The area specified for caching remains visible while the cache is generated, allowing the user to see what is still being processed.	VRV-3.2, VRV-3.1.11
VRV-6467	In installations, Visual Studio projects for examples use specific Windows SDK	Updated the specific Windows Target Platform string in exported example project files to use the latest Windows SDK.	VRV-3.2
VRV-6469	VRV needs to decode unsupported cloud types on the network	Current METOC cloud types are now properly decoded along with the custom types MAK implemented for ground fog and sandstorm (DtCloudTypeEnum32_GroundFog = 1014, DtCloudTypeEnum32_SandStorm = 1015). Blowing sand, dust, and snow have moved to particulate matter types decoded with DtLandSurfaceStateInterceptor::decodeVrlBlowingParticulateMatterType using DtBlowingParticulateMatterEnum16.	VRV-3.2
VRV-6490	Circle weather area has incorrect label	The label appearance is now consistent with that of the other weather areas.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6500	Procedural runway disappears when observer is close to it	Fixed a bug in the bounding sphere calculation when seeding aerodromes.	VRV-3.2
VRV-6506	Default decimal space for small distances should be 1, not 0	The Distance (Small) now defaults to 1 decimal place. You can change this as needed in the Display Units Settings.	VRV-3.2
VRV-6509	Clouds can render inconsistently between channels	Fixed in third-party product, SilverLining. The fix applies to local weather areas, allowing them to sync regardless of channels. This fix applies only to non-infinite layers.	VRV-3.2
VRV-6514	The 'Scale' model definition property (for 'Entity' model definitions) does not work for indirect entities	Improved support for model definition-based model scaling. This previously worked for non-indirect entities and now also works for indirect entities.	VRV-3.2
VRV-6517	Flicker (maybe Z-buffer issue) when driving ground vehicles fast (above 70/75 km/h).	Fixed the calculations regarding the earth-up vector to remove the timing issues that caused delays between the computed ground height and current observer locations.	VRV-3.2
VRV-6536	SensorFX - Hot spots not correct at startup	Fixed hot spot starting states in SensorFX.	VRV-3.2, VRV-3.1.1n
VRV-6540	lightning class requires toolkit access to modify lighting bolt lifetime	Removed static values from the class and added an overridable method for min/max lightning bolt alive time range for use with the toolkit API. Also made a small change to the shader and alive times for visual effect (the hits were mostly too short).	VRV-3.2
VRV-6557	Model Definition path doesn't use SHARE_DATA_DIR when navigating from drive	Fixed to ensure that relative paths are used if the user navigates to a data directory outside of the ./SharedData/##/latest directory.	VRV-3.2
VRV-6558	Opening a terrain while connected to an RDE does not add it to the Open Recent Terrain list	Fixed to ensure that the application algorithm does not get into a bad state and a terrain that you select while connected to the Remote Display Engine will be included in the list of recently selected terrains.	VRV-3.2
VRV-6564	Issue in introductory paragraph for makVrv::DtCloudTypeMapper Class Reference	Corrected the paragraph to be a bullet list instead of a sentence with bullet icons in it.	VRV-3.2
VRV-6566	Apron Flood lights are very bright on initial creation of Aerodrome	The scale for light intensity is 0-1, not 0-100. Fixed in the code and noted in the API documentation.	VRV-3.2
VRV-6572	Heightmap not capturing height when terrain is at higher altitudes	Changed the clip range for heightmap capture. This affects culling, not height precision. This change ensures surface weather effects display correctly.	VRV-3.2

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6581	Model Preloader does not work with indirect	Updated the Model Preload Configuration feature to support indirect.	VRV-3.2
VRV-6582	Ocean state in VR-Forces fights with local ocean state	Fixed by adding the missing logic used weather area IDs from environment layers for controlling items related to the ocean.	VRV-3.2
VRV-6584	Shifting the viewport causes the user to be unable to interact with some or all of the F2 and F4 debug menus	Added code to ensure advanced users can interact with the Framerate Statistics (F2) and Developer Debug (F4) overlays.	VRV-3.2
VRV-6586	SensorFX does not render correctly when it is not the last post processor in the pipeline	Fixed the black screen and OpenGL error that could occur in SensorFX when any other post processor was loaded after SensorFX.	VRV-3.2, VRV-3.1.11
VRV-6587	OpenGL errors occur with CameraFX when it is not the last post processor in the pipeline	Fixed OpenGL error that could occur in CameraFX when any other post processor was loaded after CameraFX.	VRV-3.2, VRV-3.1.11
VRV-6596	Tracers don't display in SensorFX MWIR, LWIR or NVG	Made improvements to better support tracers in SensorFX. Updated the WeaponEffectsRifleTracers model definition to use the WeaponEffectsRifleTracersPS particle system.	VRV-3.2
VRV-6597	Move down the signal_preTick/signal_postTick from the individual connection classes to DtBaseConnection	This change ensures that protocol-dependent plug-ins load for applications such as VR-Engage.	VRV-3.2
VRV-6603	Tracked vehicles with broken pivot animations	Fixed the calculation for track width and made sure that the track speed considers the distance traveled by the tank. There is also now support for model artists to use comments to customize the distance travelled by a single flipbook animation instead of the default.	VRV-3.2
VRV-6618	Some materials listed in the 'Material (SensorFX)' dropdown in Particle System Editor are not all mapped to SensorFX PIP files	The application now outputs a warning to the console if a particle system material does not have a mapping. The console output includes the model definition name so that you know which model definition you need to update.	VRV-3.2
VRV-6623	Canceling a tile load with a bridge layer in it before it fully loaded could cause a crash.	Modified the indirect cull shader.	VRV-3.2
VRV-6637	VR-Vantage calculates the center point of destroyed buildings using the destroyed node geometry not healthy	Refactored the code to ensure that destroying buildings, particularly one corner, works correctly.	VRV-3.2
VRV-6651	CIGI HAT/HOT Extended response can return nan elevation	The application now ensures that the normal vector in use is normalized.	VRV-3.2, VRV-3.1.1n

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
VRV-6656	Crash in indirect renderer/Driver	Fixed by modifying the indirect cull shader.	VRV-3.2
VRV-6662	Models or geometry that have not completely loaded yet can sometimes cause a crash	Fixed by modifying the indirect cull shader.	VRV-3.2
VRV-6668	SensorFX: Engine swaps to hot as engine is cooling when incrementing clock	Fixed issue where active region temperatures would be incorrect after being activated and then the time was changed.	VRV-3.2, VRV-3.1.1o
VRV-6671	Adding Ala Moana.earth file as a patch does not display as expected	The way we build the local Ala Moana terrain has changed. Updated the instructions in the VR-Vantage First Experience Guide.	VRV-3.2

Feature List

Table 2. Feature List

Key	Summary	Release Notes	Fix versions
VRE-3236	Add more information about Vortex to user documentation	There are more details on configuring Vortex ground vehicles for use by VR-Engage players. Refer to the "Ground Vehicles and Vortex" section in the Adding and Editing VR-Engage Entity Models chapter of the help or VR-Engage User Guide.	VRE-2.2
VRE-3426	Configure VR-Engage SMS with required plug-in information	Added the required names of plug-ins to the VR-Engage.sms file to enable VR-Forces to perform a check before allowing a scenario to be loaded.	VRE-2.2
VRE-3429	Add CIGI support to drive an external display	VR-Engage can now drive a non-VR-Vantage external display application using CIGI. This enables you to use other IGs to display the actions occurring in VR-Engage. See the appendix on VR-Engage Support for CIGI in the VR-Engage help or user guide.	VRE-2.2
VRE-3474	Set up Doxygen build	The VR-Engage Developer Guide is now available as part of the documentation installer.	VRE-2.2
VRE-3636	Make BMP-3 engageable in Driver role	The BMP-3 AFV ground vehicle has been added to VR-Engage SMS and is configured with the Driver role.	VRE-2.2, VRE-2.1.1a
VRE-3641	Make Vortex parameters available for configuration in movement systems	You can now edit some Vortex parameters in the Simulation Object Editor with the VR-Engage extensions. For more information, see the "Ground Vehicles and Vortex" section in the Adding and Editing VR-Engage Entity Models chapter of the VR-Engage help or user guide.	VRE-2.2, VRE-2.1.1a

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRE-3642	Add support for VR driver role	Players can now walk up to vehicles and embark into the Driver role while using a VR headset. For vehicles with modeled interiors, the player can look around, and the gauges display only when the player's gaze is close to the default driver view.	VRE-2.2, VRE-2.1.1a
VRE-3643	Improve ground vehicle driving behaviors and appearance	Improved the movement behaviors and appearance of ground vehicles while driving by setting more accurate parameters, which include: center of mass, tire radius, tire width, wheel positions, slip threshold, front/rear-wheel steering, torque, and braking torque tables.	VRE-2.2, VRE-2.1.1a
VRE-3644	New Light Strike Vehicle MK II (LSV)	This vehicle is now available for players to control with a handful of roles. For more information, refer to the help or the VR-Engage User Guide.	VRE-2.1.1a
VRE-3656	Add support for text messaging	There is now a text chat feature in VR-Engage and also VR-Forces, which allows players to communicate with each other and an instructor to communicate with players. For details, see "Text Chat" in the Common Player and Entity Features chapter of the help or VR-Engage User Guide.	VRE-2.2
VRE-3657	Include content creation tools (simTreesTool, osgEarth tools, and so on) in installation	The VR-Engage installer now includes content creation tools: simTreesTool.exe, medfTool.exe, mftTool.exe, and the various osgearth*.exe. utilities. To learn more about these tools and how to use them to manage terrain and model creation, please refer to the help or the Adding Content to MAK ONE Applications Reference Manual.	VRE-2.2
VRE-3661	New Spike missile gunner and UAV operator roles on Light Strike Vehicle MK II (LSV)	The new LSV includes new roles. The Drone Operator can deploy and control the drone from the vehicle, even when the LSV is moving. The Primary Gunner has three sub-roles for the different possible guns. One is for a Spike missile launcher, which the player can aim manually or specify indirect fire using MGRS coordinates. For details, see the "Gunner Role" section in the Controlling Ground Vehicles chapter of the help or user guide.	VRE-2.2
VRE-3687	Add FPV Drone roles	There are new drone aircraft that you can control: DJI 200 Quadcopter, DJI Mavic 3 Small Munition, Flare Rapider 4 Quadcopter, Parrot Anafi Quadcopter. The new LSV also includes a drone operator role where the player can deploy and operate a quadcopter. These entities use a first-person view while the player operates the drone. See the chapter on Controlling Drones in the help or VR-Engage User Guide.	VRE-2.2
VRE-3703	Add the M777 Howitzer	The M777 Howitzer is now towable. Note that it is not configured for players to control.	VRE-2.2
VRE-3705	Add LAV 6 vehicle and roles to VR-Engage	The LAV 6 ISC ground vehicle has been added to VR-Engage SMS and is configured with the Driver, Gunner, Driver/Gunner, Commander, and Passenger roles.	VRE-2.2
VRE-3706	Add Tank Leopard 2A4 vehicle and roles	The Leopard 2A4 ground vehicle has been added to VR-Engage SMS and is configured with the Driver, Gunner, Commander, and Loader roles.	VRE-2.2

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRE-3708	Add MSVS MHC Gun Tractor to VR-Engage	The MSVS SMP Gun Tractor ground vehicle has been added to VR-Engage SMS and is configured with the Driver role.	VRE-2.2
VRE-3769	Make --windowedMode automatically respect the initial state of the Full Screen check box in Choose Role Panel	If you use the --windowedMode command-line option when starting VR-Engage, the Full Screen check box in the Choose Role Panel is cleared by default instead of selected.	VRE-2.2
VRE-3871	Reorganize table for binding QML properties to state attributes	In role files, the parameters for binding QML properties has been renamed and restructured. It is now named bindQmlPropertyToAttribute.	VRE-2.2
VRE-3981	Add VR-Engage toolkit installation code	The VR-Engage SDK is now available to users with a license to use it. Note that it requires an installation code. For more information, contact your MAK distributor or use the Support Portal.	VRE-2.2
VRE-4001	Add Optimizing Performance chapter to VR-Engage and add contents that are specific to VRE	The new Optimizing Performance chapter in the help and the VR-Engage User Guide provides guidelines on how to improve the performance of VR-Engage for the standard use cases.	VRE-2.2
VRE-4005	Wounded Carry - IK for hand/arms need improvement	Improved the positioning of the arms and hands for soldier entities performing Wounded Carry actions.	VRE-2.2
VRE-4164	Add Differential Lock For MRAP and JLTV	Added the differential lock functionality to the MRAP M-ATV and M1278 L-ATV-HGC (JLTV). Players can enable and disable this using the Action Menu. Refer to the Controlling Ground Vehicles chapter in the help or VR-Engage User Guide to learn how to use the differential lock.	VRE-2.2, VRE-IITSEC2025
VRV-57	Add support for multiple WebSocket connections	You can now stream to more than one WebSocket, either the same view or different views. Add more connection ports to stream the same view, or define additional video streams to stream different views. See the help or the VR-Vantage Users Guide for instructions.	VRV-3.2
VRV-196	Complete extended type support for CIGI V4	Added support for extended entity types when using CIGI V4, per the CIGI standard "The content and intended usage of the extended entity type record closely parallels the Entity Type record used by [DIS]". VR-Vantage's extended type support looks up the model definition from the 3D model set for an entity type mapped to an element definition in the Visual Model Editors. Types of element definitions are mapped in the Simulation Object Type Mappings dialog box.	VRV-3.2

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRV-4164	Update GDAL version to 3.x	Updated GDAL to version 3.10.1.	VRV-3.2
VRV-4368	Add capability to read CDB Composite Material on a 3D Model for SensorFX	Added support for material classification of composite materials on models.	VRV-3.2
VRV-4521	Add feature filtering to BuildingLayer	You can now use the FilteredFeatures layer for buildings to filter locally.	VRV-3.2
VRV-5150	Upgrade Tracy to version 0.11.1	Updated version of Tracy included with the application. This included a change to a library name; if your code referenced TracyProfiler.lib, update it to TracyClient.lib.	VRV-3.2
VRV-5156	Update Remote Graphics to use new decal projected rendering where appropriate	There is now support for projected line and area decals.	VRV-3.2
VRV-5187	Add light group support for dynamic light/emissive textures	Added support for entity light source and emissive textures controlled by light groups. The entity models must use the "@dis light_group" comment above the light sources and emissive geometry to specify the correct light group. (Currently, the light group also requires an associated light point to create the light group, otherwise the emissive geometry is controlled by the default group as if there were no comments.)	VRV-3.2
VRV-5270	Improvement to data entry for latitude and longitude	Updated to allow users to enter lowercase letters for north, south, east, and west when entering latitude and longitude. The application no longer requires users to enter uppercase letters.	VRV-3.2
VRV-5489	Update exampleGimbalDriver to render the sensor view overlay	Updated the exampleGimbalDriver example to render the sensor view overlay to a channel. More information is available in example's documentation.	VRV-3.2
VRV-5690	Remove use of std::auto_ptr and boost::shared_ptr	To support C++20 and the new version of Boost, replaced std::auto_ptr with std::unique_ptr throughout the codebase. (This may require changes to any surrounding code, such as adding std::move.) Additionally, switched Boost shared/weak pointers to the std versions instead. (This should simply be a find/replace unless there are cases that depend on an external library.)	VRV-3.2

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRV-5703	Remove ambush visualizer pathway in favor of geometry generation	Removed the Ambush visualizer class in favor of the generic DtTacticalGraphicModelVisualizer class, which makes use of new vertices generation pathways. Currently, this supports only linear models.	VRV-3.2
VRV-5718	Aerodromes - improve the appearance of tarmac lines	You can now customize the appearance of tarmac lines by editing the <linear_features> block in the aerodrome_catalog.xml file.	VRV-3.2
VRV-5726	Add a Parameter to Earth file to turn off pre-calculated elevation ranges	Fictional terrains that are at Latitude 0, Longitude 0, and Altitude 0, should not use a precalculated spatial index based on real world elevation data. The new "disable_elevation_ranges" earth file parameter allows you to disable the spatial index for those kinds of terrains.	VRV-3.2
VRV-5728	Extend the ability to visualize scene graph node properties for debugging	The Terrain Information Panel has two new check boxes in the Scene Graph tab to help terrain artists and developers with debugging: Visualize Node Bounds and Visualize LODs. These enable visualizations of the selected node as you browse through a scene graph.	VRV-3.2
VRV-5763	Upgrade to Boost 1.84.0	Upgraded the Boost version for compatibility with C++20.	VRV-3.2
VRV-5766	Grid Lines should use separate parameters for number of lines and number of line *segments*	The new parameter maxGridLineSegments is configurable through the GridLines model definition. It controls the number of line segments in a 'curved' grid line (instead of being based on the maxGridLines parameter). This reduces the maxGridLines default value.	VRV-3.2
VRV-5797	CDB: reinterpret raster heights as geoid-relative upon load	The application can now process CDB geodetic (ellipsoidal, or HAE) elevation data and interpret those values as inverted MSL values. For details, see "Referencing an Earth Gravitational Model (EGM)" in the the help or the Adding Content to MAK ONE Applications Reference Manual.	VRV-3.2
VRV-5831	Upgrade Windows to CUDA 11.8	Updated to CUDA 11.8, which supports VS2022 and is also compatible with CUDA 11.7.	VRV-3.2
VRV-5873	Update an example to use OpenGL to render 3D geometry	The exampleGLDrawingPlugin example has been expanded to include using OpenGL to render 3D geometry into the 3D scene with correct depth testing.	VRV-3.2

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRV-5882	Expand exampleViewControl to demonstrate how to attach observers to sensors	The exampleViewControl now demonstrates how to attach observers to sensors. See the information on the attach observer commands in that example for details.	VRV-3.2
VRV-5884	Support Azure Maps API (to replace Bing API)	Microsoft is deprecating Bing Maps in favor of Azure Maps, therefore osgEarth and MAK ONE now support Azure Maps. See the VR-Vantage help or the Adding Content to MAK ONE Applications Reference Manual for details.	VRV-3.2
VRV-5885	Add ability to set video quality on the GPU to low / medium / high via our API	There is now API support for NV_ENC_TUNING_INFO and NV_ENC_PRESET when video streaming. This is only available for developing and using plug-ins.	VRV-3.2
VRV-5903	Sensor Overlay API needs to be opened up	Added more support for customizing the sensor overlay section drawers. See the exampleGimbalDriver to learn more.	VRV-3.2
VRV-5960	Upgrade TBB	Upgraded TBB version to OneTBB 2021.12 for C++20 compatibility.	VRV-3.2
VRV-5972	SensorFX support for CDB material classification on terrain skin	The application now supports CDB material classification (land use), which allows SensorFX to use the material types. For more information, see the help or the Adding Content to MAK ONE Applications Reference Manual.	VRV-3.2
VRV-5989	Add ability to add multiple FOM modules at the same time	When you add FOM modules using the HLA 1516 Evolved Connections page of the Simulation Connections dialog box, you can now select multiple files at the same time in the Browse for FOM Files to Add dialog box.	VRV-3.2
VRV-6006	Improve CDB sigsize support	Added logic to prevent that collapsing of LODs, improving the results.	VRV-3.2
VRV-6028	Load highest LOD GS Models for CDB terrains first	The application now starts with the high LODs and then works its way down to the lower LODs. This improves loading speed.	VRV-3.2, VRV-3.1.1b
VRV-6075	Update exampleSymbolFacade to exhibit new altitude-based icon scaling	The exampleSymbolFacade example now includes the application's support for scaling icons by altitude. Refer to the Developer's Guide to learn more about using this example.	VRV-3.2

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRV-6082	Investigate High Number of Elevation Requests at the Schwyz viewpoint	Improved the osgEarth Network Monitor by adding more filters (type and status) and showing the number of requests that pass the filter in a status bar at the bottom of the window.	VRV-3.2
VRV-6083	Document the terrain options file (inline), esp. the page-out expiry options.	Added more information, such as recommended defaults and any other options that are not listed, to ./TerrainData/TerrainConfiguration/options.terrain-rex-default.xml.	VRV-3.2
VRV-6085	Create an example which exemplifies how to create a custom element attribute	Created a new example, exampleCustomElementAttributePlugin, which reports an entity's label as a custom element attribute. Refer to the class doc for more information. Also updated exampleElementAttributesPlugin to visualize the custom element attribute to the console.	VRV-3.2, VRV-3.1.1d
VRV-6090	Change how OsgEarth network monitor gets updated so functionality stays in sync with the OsgEarth master	Improved the F2 statistics to update after users make improvements to the version in the osgEarth master.	VRV-3.2
VRV-6103	Show entity marking text in the sensor gimbal overlay	The overlay for sensor view windows now displays the entity's marking text instead of "Ownship" at the upper right-hand corner of the sensor view.	VRV-3.2
VRV-6106	SensorFX: Add debugging to Developer Debug Overlay	When working with material classifications for MAK ONE applications with SensorFX, you can now access more specific material system debugging in the Developer Debug Overlay, accessed by pressing F4. Use the options under SensorFX Material System Debug Settings.	VRV-3.2, VRV-3.1.1d
VRV-6111	Upgrade GEOS to C++20 compatible version	Updated GEOS to version 3.13.0.	VRV-3.2
VRV-6116	SQLite needs to be updated in VR-Vantage so that VR-Forces gets the newer version	Updated MAK ONE applications to SQLite 3.47.2.	VRV-3.2
VRV-6117	Update 3rd Party Software to latest version of SQLite	Updated third-party libraries and dependencies to use version SQLite 3.47.2.	VRV-3.2

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRV-6122	IndirectLog.log file doesn't need to be generated	Previously, a file nnn##_IndirectLog_##-##_nnn-##_##.log was generated, but it contained the same information that is included in the product's standard log file and therefore was disabled. It is no longer generated (unless you define the VRV_ENABLE_INDIRECT_LOG environment variable).	VRV-3.2, VRV-3.1.1d
VRV-6126	Improve CDB frame time smoothing	This feature contains code improvements to reduce frame time spikes with CDB terrains.	VRV-3.2, VRV-3.1.1d
VRV-6137	Pre-process CDB models for improved load times	The cdbTool utility has been updated to improve runtime performance by combining feature models into groups and simplifying the node hierarchy. Note that the CDB terrain database is not modified in any way; the utility uses the information in the database to generate files that it saves in a cache directory, and then VR-Vantage loads those optimized files instead. (The previous functionality of the cdbTool still works, which is to write out medfs and meifs for GS buildings.) Read the "Caching CDB Data (cdbTool)" section of the help or the Adding Content to MAK ONE Applications Reference Manual for details.	VRV-3.2, VRV-3.1.1e
VRV-6141	Add per frame time budgets for indirect operations to have either faster load times, or smoother scenes	- The Per Frame Time Budgets slider allows you to adjust the indirect time budgets per frame. Reducing the time budget can help prevent stalls in the application. Note that this does increase loading time: setting a higher budget reduces loading times. You can adjust the per-frame budgets for the GPU arena's one-time indirect operations and for models. - The CDB Loader slider allows you to control the number of threads that the CDB model loader can use when loading models in parallel. (This applies only to geospecific models.)	VRV-3.2, VRV-3.1.1b
VRV-6144	Add ability to control render order of styles in a FeatureImage or RoadSurface layer in makOsgEarth	Updated the rendering order so that styles either render in their order of appearance or in order of the render-order symbol, if present. Refer to the OSG Earth documentation for more information.	VRV-3.2
VRV-6146	Add a centralized location for environment variables	The DtDe now holds a repository of cached environment variables that can be checked during runtime without the penalty of a system call. Developers can update their code to take advantage of this if desired, but it is not required.	VRV-3.2, VRV-3.1.1d
VRV-6149	Allow the controlling of an 'LOD Scale' that apply to entities only	In the Observer Control Panel, the LOD Distance Scale is now separated into two different sliders: one for entities and one for terrain. The gives you greater control over what displays in the window. For example, you can choose to see entities that are farther away from the observer without showing a higher level of detail for distant terrain.	VRV-3.2, VRV-3.1.1d
VRV-6164	Add CDB texture management for 301 textures	Improved processing of geospecific textures to ensure that MEIF files are not generated for duplicate textures. (Some CDB database designs use the 301 dataset inefficiently.)	VRV-3.2

Table 2. Feature List (continued)

Key	Summary	Release Notes	Fix versions
VRV-6168	Make the new CDB pre cache data portable between machines	You can run the cdbTool once to generate cache files for a CDB terrain and then copy the files from the cache directory on that machine to any other machine that will load the same CDB terrain. This is because the cdbTool uses relative paths.	VRV-3.2, VRV-3.1.1e
VRV-6180	osgEarth should output name of missing biome assets to the console	osgEarth now prints warnings when either a biome parent ID is not found while parsing the biome definitions or a model asset is not found in the asset catalog while parsing the biome catalog.	VRV-3.2
VRV-6183	Add ability to query out all network driver configuration options	The new ./bin64/MAK-ONE-2025-Config.xml file defines default exercise connection settings. You can use the --exConnConfigFile command-line option to load your own configuration file or files. Refer to the MAK ONE Interoperability Guide for more information.	VRV-3.2
VRV-6254	Support for HLA 4	VR-Vantage applications support the HLA 4 (IEEE 1516_2025) protocol.	VRV-3.2
VRV-6283	Changing the Field of View should make automatic adjusts to LOD scale	When calculating the final view magnification for a channel, VR-Vantage can now consider the current frustum in relation to the default frustum to compute a field of view (FOV) difference ratio, which can be 1 or greater. The FOV difference ratio represents the zoom that a user employs by using a smaller FOV, and this ratio contributes to the final view magnification that is applied to the LOD scale factor and determines whether the LOD center approach is employed or not. Use the Enable Frustum-based View Magnification option in the Observer Control Panel to specify whether to use this when narrowing the FOV.	VRV-3.2, VRV-3.1.1h
VRV-6292	Add a dialog for LOD Center Settings	The new LOD Center Settings button in the Observer Settings page of the Display Settings allows you to fine-tune the observer settings when the magnification is greater than one.	VRV-3.2, VRV-3.1.1i
VRV-6355	Add capability to edit vertices in the OSM feature data and apply these edits in a client-side patch	You can use the new Feature Patches to locally override features. For more information, refer to the help or the Adding Content to MAK ONE Applications Reference Manual.	VRV-3.2
VRV-6419	Move up on newer version of Rapid JSON	Updated to the revision of the Rapid JSON library that is used by cesium-native v0.37.0.	VRV-3.2
VRV-6483	Add --hasNTPSync support for Light point animations	The --hasNTPSync command-line option now enables you to synchronize time-based light point and continuous flipbook animations between different VR-Vantage applications, such as other instances of VR-Vantage or the VR-Forces GUI.	VRV-3.2, VRV-3.1.1l
VRV-6601	Add support for CIGI IG Mode in SOF and IG control packets	IG Mode supports only 0 (Reset/Standby) and 1 (Operate). This applies to the IG control host-to-IG packets and the Start of Frame (SOF) IG-to-host packets.	VRV-3.2, VRV-3.1.1m

Known Problems

Problems can arise with any product. MAK has a knowledge base of the problems that we know about, which is always changing as new problems are identified and new solutions are found. To learn how to address known problems with VR-Engage and other MAK ONE products, access the MAK ONE Product Support Knowledge Base:

<https://www.mak.com/knowledge>.

If the problem you are experiencing is not addressed in the knowledge base, please contact your MAK distributor or use the [Support Portal](#) at <https://www.mak.com/mak-one/support/portal>.