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What's Up MAK

A Simulation with a View

VR-Vantage IG presents simulationists with a flexible, high performance image generation solution. When combined with MAK simulation components, it provides unique benefits to users. As a result, VR-Vantage IG is being adopted by more and more of MAK's customers. By Rob Hamilton

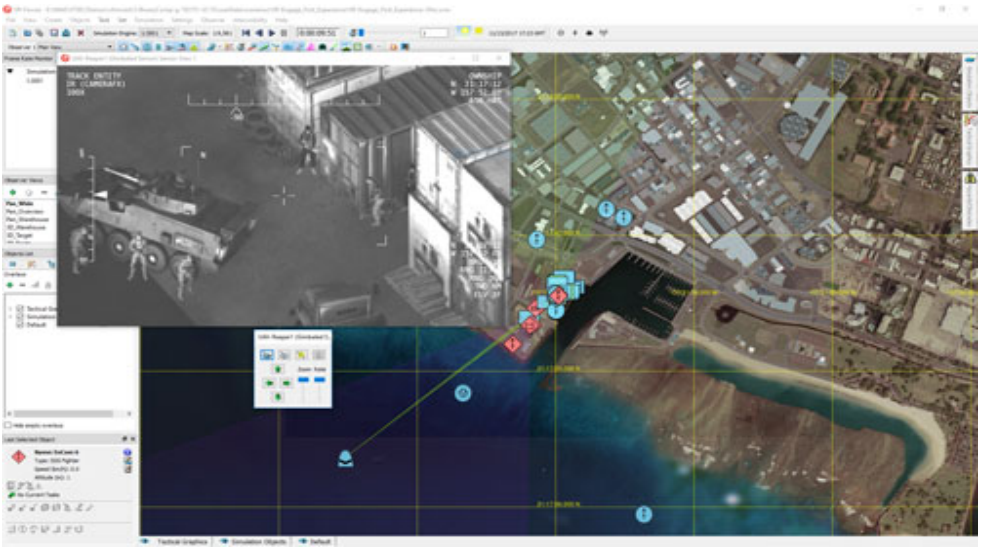
Over the years, MAK has developed VR-Vantage IG as a flexible platform to satisfy the needs of both training system providers and visualizers of the simulated battlefield who are looking for an IG upgrade with accurate out-the-window and sensor scene generation. Thanks to this continual growth, today VR-Vantage IG is a first class image generator for air, land, and sea simulations. Today, we'll look at an example from each domain that illustrates its power, and we'll also see how the rest of the MAK suite complements VR-Vantage IG to render application specific scenes.

Air

IGs are commonly used to train sensor operators in airborne surveillance. Trainers want to give their students a taste of what it's like to use a gimbal-mounted sensor payload, for example to monitor a perimeter zone, or to identify and track targets in densely-populated urban settings. Operators need to develop strategies for controlling the sensor from an airborne platform and learning what to look for in Electro-Optical (EO) and Infra-Red (IR) sensors. In the end, they should be able to more effectively detect and maintain visual contact with their target.

A typical training might involve identifying and tracking a human target in a crowded urban area. The training system needs to have accurate sensor image generation that matches the types of sensors being trained. The airborne platform itself may be flown by someone at a UAV ground control simulation, a flight simulator host, or a CGF simulation. To give proper context to the trainee, the simulation requires a rich world in which to execute the training, along with appropriate pattern-of-life to fill the scene with high-fidelity human activity.

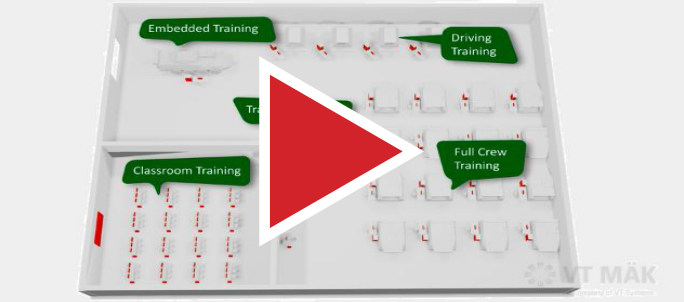
VR-Vantage IG has some unique advantages that make it a perfect fit for this type of training. VR-Vantage IG delivers high-performance visual and EO/IR sensor channels. The sensor channels can be configured with generic camera/sensor effects or with physics-based rendering by adding the SensorFX plugin. Sensor performance parameters can be modified to reproduce an actual sensor system such as the MX-18. VR-Vantage can stream the rendered video to actual equipment to emulate a live sensor feed. VR-Vantage's API lets developers create overlays to match specific sensor operator interfaces. Sensors can be attached to any simulated entity, and controlled interactively through keyboard and mouse, through the CIGI interface, or remotely from other devices using the VR-Vantage API to emulate custom hand controllers.



Training systems also benefit from pairing VR-Vantage IG with the rest of the MAK product suite. VR-Forces provides a library of entities that can easily be planned into scenarios to support ISR training objectives. Crowds of people can be placed and controlled with a single command. Each crowd object represents dozens or hundreds of human characters that individually interact with each other and civilian and military vehicular traffic. Individual threats can be given specific plans to behave precisely as needed to challenge the trainee. Instructors can also control entities using the VR-Forces CGF and interactively using VR-Engage. Thanks to MAK's agile terrain solution, VR-Vantage IG can use your terrain database or procedurally generate one from source GIS data. If your database does not have material classifications, tools are available to generate them from the visual textures within your database. For those taking advantage of the procedural terrain generation, VR-TheWorld Server is available to provide streaming terrain services that comes with a global baseline of terrain elevation, imagery, and OpenStreetMap feature data, as well as several built up cities areas.

Land

Ground vehicle operation training requires effective communication within teams and individual proficiency at specific roles. In order to maximize survivability and defensive capability, many modern ground vehicles are windowless. If the vehicle has windows, an out-the-window (OTW) scene is needed. For those without windows, trainees need to learn how to drive the vehicles and develop situational awareness using external camera feeds for their outside view. In addition, they need to be able to maximize the capability of their sensor and onboard weapons systems should they enter a hot zone, to quickly identify and take out opposing entities.



Click on the play button above to watch a video of a mechanized infantry training system!

Take, for example, a mission to drive into a hostile urban area designated as a hot zone with a long history of ambushes by insurgents. As dusk approaches, it becomes increasingly difficult to differentiate hostiles from civilian crowds – situational awareness is paramount. A full range of out the window views and sensors are needed to give drivers experience navigating while minimizing the risk of ambush. Rich environments filled with traffic, crowds of people, buildings, and cultural clutter are needed so teams can train to defend themselves, neutralize the threat, or escape in the case of attack.

VR-Vantage IG is a flexible solution that can provide all the OTW, camera, and sensor views required for ground vehicle operation. VR-Vantage IG can be set up to render a single channel for maximum performance or multiple channels can be rendered from a single IG to save on hardware costs. VR-Vantage's GUI allows instructors to interactively place cultural features in

the scene to add detail to the terrain database on a mission by mission basis. VR-Vantage has procedural terrain capabilities built in, allowing users to create high-resolution terrain that are relatively lightweight and provide the detail required for effective training.

Ground training simulations can also benefit by using all the products in the MAK Suite together. VR-Engage Virtual Simulators use the same rendering engine as VR-Vantage and VR-Forces and perfectly correlate with the OTW and sensor scenes generated by VR-Vantage IG. With VR-Engage trainees can get a real feel for their terrain with accurate physics-based vehicle dynamics. VR-Forces simulates a wide array of vehicles, human characters and even animals to populate your scene with friendly, neutral, and opposing AI forces.

Sea

In the maritime environment, there is a need to train sailors to work as a team to identify threats and defend a naval vessel against oncoming attacks. Through effective use of surveillance, communication, and weapons systems, trainees gain familiarity and develop proficiency with the shipboard systems, as well as improve communication effectiveness within the group.

Click on the play button above to watch a video of a shipboard weapons training system!

One configuration for training consists of a crew made up of deck mounted weapon system operators, a spotter, and a UAV for extended surveillance and situational awareness. When the UAV operator sees a vessel near the ship, he must first attempt to classify it and identify it as friend or foe. He will then radio down to the spotter, warning him of the bearing and distance of the entity. The spotter then uses his binoculars to confirm the position and notifies the weapon operators, who each act on his orders - to attempt to shoot the inbound entity if it is a threat, or allow it to pass by if it is friendly. The spotter and the rest of the deck crew could be on a motion platform to simulate the pitch of the ship. A large multi-channel domed visual system projects the scene of the maritime environment. To stress the team, the instructor may introduce a variety of boats and air vehicles to use as potential targets in different

quantities and from different angles. He may also change the sea state or atmospheric environment to increase the dynamics of the ocean or decrease visibility.

VR-Vantage IG delivers the performance this simulation needs, with the capacity for users to tune it to run multiple synchronized channels at 60 Hz. Multi-channel image warping and blending is supported to create large seamless visual displays. VR-Vantage IG renders beautiful sky, cloud, and ocean scenes, fully synchronized across multiple channels, that are particularly important for water environments – delivering high-fidelity sea states, lighting, and reflections. The UAV and the spotter's binoculars also use scenes rendered by VR-Vantage IG, providing correlation between all the training positions.

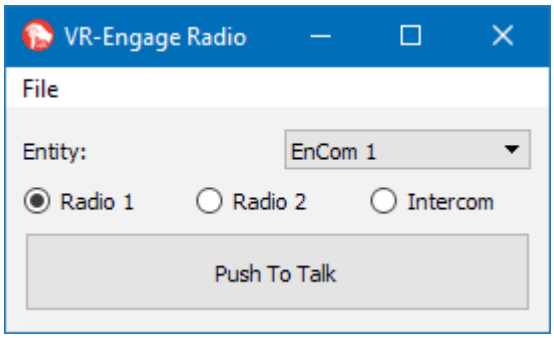
Ships modeled in VR-Forces autonomously navigate and avoid hitting each other and running aground, making it easier to set up scenarios with lots of shipping traffic. VR-TheWorld Server provides the whole world, bathymetry to model the depths of the sea, beautiful coastlines, and the land beyond.

VR-Vantage IG with SensorFX generates realistic scenes for out-the-window and sensor channels. Adding the other elements of the MAK Suite to the simulation enables our customers to fill those scenes with the activity of virtual simulators and computer generated forces, all taking place in a correlated VR-World.

With top-quality scenes, flexible deployment, terrain agility, and the support of the MAK suite, VR-Vantage IG is the go-to for those looking for an IG upgrade, and those looking to add sensor scene generation to their simulation system. Click here to learn more about VR-Vantage IG, or click here to request a demo.

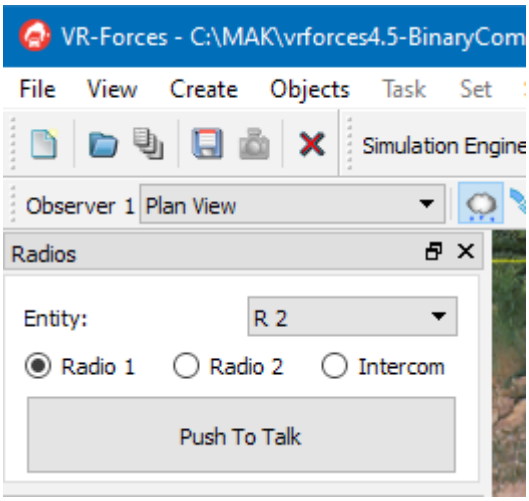
Tech Tip: Can We Talk? Radio Communication in VR-Engage By Fred Wersan

VR-Engage has supported radio communication among players since release 1.0. All you need is a USB headset. In release 1.2 it enhances radio communication by including a standalone radio application and adding radio support to VR-Forces.



The standalone radio application lets someone who is not controlling a character in VR-Engage communicate with the people who are. The radio application is in the ./bin64 directory. Versions are protocol-specific, so use the one that matches the protocol that you are

using when you run VR-Engage, for example DIS or HLA Evolved. The executables are makRadioAppDIS.exe, makRadioAppHLA13.exe, makRadioAppHLA1516.exe, and makRadioAppHLA1516e.exe.



When you run the radio application, a simple GUI opens (Figure 1).

Select the entity you want to represent, or select ADMIN if you are speaking as an observer.

Select the channel you want to talk on.

Click Push To Talk and start talking.

If you install the VR-Forces add-ons, a radio application gets installed as a panel. If it does not open automatically, open it by choosing View -> Radios Panel. It looks just like the standalone radio application and works just like it too (Figure 2).

For more information on VR-Engage, click here. To request a demo, click here.

NewsMAKers

We've released the latest version of our super-popular Tech Savvy Guide to Virtual Simulation! Download it for free here!

Ivan Diaz exhibited on behalf of MAK at the CAMAN 2018 event in Madrid, Cundinamarca, Colombia. Read his report from the show here.

We've just announced a new upcoming on-site training class for VR-Forces! The class is one week long - please contact your sales rep to sign up. You can view the syllabus here.

Follow us on Facebook, Twitter, and LinkedIn! We bring frequent updates, show news, videos, and sneak peeks of MAK products.