



Visualize: From Every Vantage Point

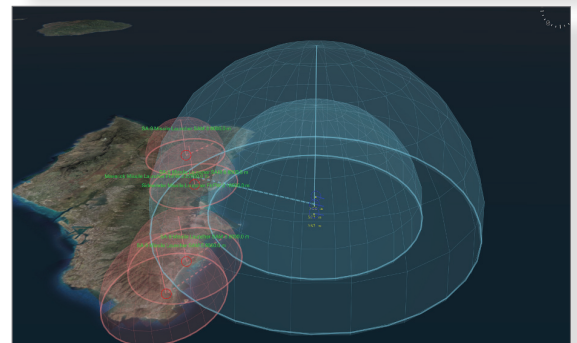
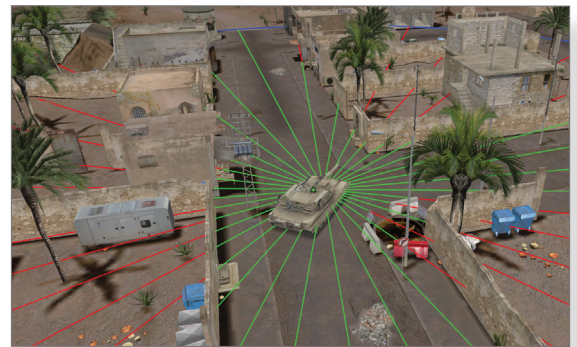
VR-Vantage Stealth

VR-Vantage Stealth is MÄK's information station where you can view the virtual world in 2D and 3D. Whether you need it for situational awareness, simulation debugging, or after action review, VR-Vantage Stealth provides the most data about your networked virtual world and presents it in a clear and accessible way. With VR-Vantage Stealth, you can quickly achieve a "big picture" understanding of a battlefield situation while retaining an immersive sense of perspective.

Focused on Information

VR-Vantage Stealth visually presents a wide variety of information about your DIS or HLA virtual environment. You can simultaneously view the virtual world in 2D and 3D, with configurable information overlays presented in both displays. These informational overlays include:

- **Trailing effects** - special effects that follow moving entities; they appear as dust trails behind ground vehicles, the wake behind ships, or footprints behind people
- **Attacker/target lines** - graphics that show who is engaging with whom
- **Track histories** - graphical representations showing where entities have been
- **Entity labels** - information about an entity, as well as its location even if it's hard to locate in the scene
- **Sensor volumes** - display electromagnetic emissions from an entity's sensor systems
- **Height-above-terrain indicators** - show how high above the terrain an entity is located
- **Intervisibility lines** - display the line-of-sight between entities or between places in a synthetic environment
- **Aggregate icons and bounding volumes** - show the location of aggregate units and the space they take up



VR-Vantage Stealth can also draw 3D representations of tactical graphics from VR-Forces, such as waypoints, routes, and areas. Picture-in-picture inset views allow you to see what any vehicle is seeing, even as you watch it travel across the terrain. Drop simulated cameras anywhere in the world to zoom in on multiple parts of the battle at once. Switch any visual channel from 3D to 2D mode with a single click. Or use a 2D inset to help with navigation as you fly your 3D eyepoint around the battlefield in the main display. VR-Vantage Stealth lets you watch entity-level engagements without losing the command-level view.



Intuitive Navigation

Navigation is easy in VR-Vantage Stealth, whether you're flying freely over the terrain, following an entity as it moves through the synthetic environment, or tracking a missile from a fixed vantage point. We've combined the best elements of first-person-shooters, real-time-strategy games, and "spin the earth" virtual globe applications, to provide an interface that you'll find familiar the moment you start using it.

Navigate through the world by dragging the terrain, clicking on a destination, or maneuvering the eyepoint using familiar first-person-shooter controls. You can orbit around buildings or props, follow or track moving entities, jump in the cockpit for an out-the-window view, or mount your virtual camera on a vehicle. While navigating, you can save a list of your favorite views for rapid retrieval.

Terrain Agility - MÄK's Ability to Easily Load Your Terrain

VR-Vantage Stealth is Terrain Agile — able to work with a wide variety of terrain approaches, formats, and protocols. The tool can load traditional databases, like handmodeled OpenFlight, page large-area terrains, like MetaFlight, and build visual databases “on-the-fly” from source data like DTED, GeoTIFF, and Shapefiles. It can even dynamically create 3D terrain by streaming in elevation, imagery, and features from terrain servers, like MÄK's VR-TheWorld Server, to build up large areas and by cutting-in site models for high fidelity ground detail.

With VR-Vantage Stealth, you can load site models with dense urban build-up and thick vegetation as well as tiled terrain databases that page in over large areas. You can extract buildings and other models from the terrain and manipulate them directly in the synthetic environment. To see human characters interacting inside, you can manipulate specific buildings to make them semi-transparent.

Built-in Content and Capability

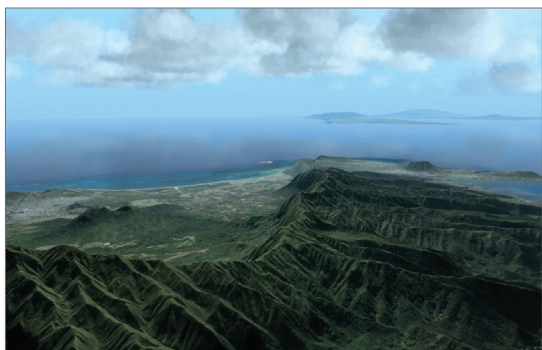
VR-Vantage Stealth comes with a rich set of top-quality 3D entity models from companies like SimthetiQ and RealDB that support attached parts, damage representations, and articulated parts such as turrets and guns. Built-in support for Boston Dynamics' DIGuy™, DiSTI's GL Studio®, IDV's SpeedTree®, and Sundog's SilverLining™ means that you don't need to integrate and configure extra modules, or buy additional run-time licenses to have great looking human characters, interactive cockpit displays, dynamic trees and bushes, weather effects, and volumetric clouds. And HLA and DIS support through MÄK's own VR-Link networking toolkit is included, so that interoperability is a given, not an add-on.

Distributed Rendering

VR-Vantage Stealth's built-in distributed rendering architecture supports large, multichannel, “situation room” style displays. An intuitive GUI allows you to connect to remote display engines running on additional PCs to increase your field of view.

VR-Vantage IG

VR-Vantage IG is MÄK's configurable desktop Image Generator (IG) for out-the-window (OTW) scenes, camera views, and sensor channels. Its built-in distributed rendering architecture supports many different display configurations — from simple desktop deployments to multi-channel displays for virtual cockpits and training systems.



Simulate a Sensor Video Stream

VR-Vantage supports Motion Imagery Standards Board (MISB) streaming video and meta-data standards out-of-the-box. You can connect VR-Vantage IG to your MPEG-2 compliant Situation Awareness System control station and receive a simulated video stream of your virtual environment. You can also direct your video stream to a TCP socket, web-page, or local file to record what your simulated sensors captured.

With VR-Vantage IG, you can use out-of-the-box camera effects to provide low cost sensor visualization to your video stream, or you can upgrade to our SensorFX module for high fidelity physics-based sensor visualization.

Host-IG Interface

VR-Vantage IG supports the industry-standard CIGI (Common Image Generator Interface) protocol for controlling the IG from a separate simulation host. Through CIGI, your host application can control the eyepoint, place and control moving models, load terrains, set visual parameters, and more. VR-Vantage IG can also provide mission functions by responding to line-of-sight and height-above-terrain queries.

FEATURES

- SIMULTANEOUS 2D AND 3D VISUALIZATION DISPLAYS
- VIEW ENTITIES, AGGREGATES, TRAJECTORIES, SENSORS, AND MORE
- GAME-LIKE NAVIGATION
- EASY MODEL INTEGRATION
- LOADED WITH CONTENT
- TERRAIN AGILE
- BUILT-IN SUPPORT FOR DIS AND HLA
- GEOCENTRIC OR PROJECTED TERRAINS
- STREAMING TERRAIN DATABASES
- EXAGGERATED REALITY VIEW FOR ENHANCED SITUATIONAL AWARENESS
- CUSTOMIZABLE THROUGH VR-VANTAGE TOOLKIT
- BUILT IN SUPPORT FOR STREAMING VIDEO

USE CASES

- SITUATIONAL AWARENESS
- AFTER ACTION REVIEW
- SIMULATION DEBUGGING
- INSTRUCTOR OPERATOR STATIONS
- PROJECT DEMONSTRATION
- SIMULATION ANALYSIS
- COMMON OPERATING PICTURE
- 2D/3D VISUALIZATION

VR-Vantage IG can also be controlled using HLA and DIS protocols. You can send special DIS or HLA messages to control the eyepoint, or use the run-time GUI to place the eyepoint at a simulated camera location on the terrain, or to attach to a specific HLA or DIS entity. Because it natively supports DIS and HLA, you can render the simulation activity on your network without having to pass all the entity and interaction information through your host vehicle simulation.



- USE CASES**
- FLIGHT SIMULATORS
 - UVS OPERATOR STATIONS
 - GROUND CREW TRAINERS
 - VISUAL AND SENSOR IMAGE GENERATORS

- FEATURES**
- PC-BASED IG SOFTWARE
 - 3D IMAGE GENERATION
 - CIGI, HLA, AND DIS COMPLIANT
 - SENSORFX: PHYSICALLY ACCURATE NVG, EO, IR
 - CAMERAFX: LOW-COST NVG, EO, IR
 - CUSTOMIZABLE THROUGH VR-VANTAGE TOOLKIT
 - MULTI-CHANNEL DISTRIBUTED RENDERING
 - GL STUDIO COCKPIT DISPLAYS
 - DI-GUY HUMAN CHARACTERS
 - SPEEDTREE VEGETATION
 - SILVERLINING CLOUDS AND WEATHER EFFECTS
 - STREAMING TERRAIN DATABASES
 - DYNAMIC 3D OCEAN
 - TERRAIN AGILE
 - BASED ON OPENSCENEGAPH
 - STREAMING VIDEO WITH META DATA

VR-Vantage PVD

MÄK's VR-Vantage PVD is our 2D solution for interacting with the virtual battlefield. This plan view display is the right interface for providing situational awareness and managing entities in large areas, as well as keeping track of a single trainee's location. Whether you're building a command center or a cockpit trainer, VR-Vantage PVD presents a tactical view of your simulation environment using raster graphic maps or terrain database maps, operational and analytical graphics, and MILSPEC 2525b entity icons. Used stand-alone or integrated into your training systems, VR-Vantage PVD is the high performance mapping solution.

Standard map formats and an intuitive user interface allow you to easily answer questions about the placement of forces and how terrain might affect the engagement. VR-Vantage PVD displays line-of-sight information, track histories, sensor coverage areas, and fire and detonate lines. Use tactical graphics, such as lines, points, areas, symbols, and text to understand and analyze a simulation. The fast map view allows you to quickly and easily navigate to the portion of the terrain database you want to view.

Customization

The VR-Vantage PVD comes with MILSTD 2525B icons but you can also use your own custom entity or aggregate symbols or extend our symbol decorations to display custom information. The display is adaptable, giving you the flexibility to enable only the features you need. With an available C++ toolkit, you can customize the PVD or embed 2D tactical map views in other applications. The VR-Vantage PVD is the perfect foundation for a custom situational awareness display.

Terrain Agility - Easily Load Your Terrain

Like VR-Vantage Stealth, applications built with VR-Vantage PVD are Terrain Agile — able to work with a wide variety of terrain approaches, formats, and protocols. The tool can load map data or traditional databases, like hand-modeled OpenFlight, page large-area terrains, like MetaFlight, and build visual databases "on-the-fly" from source data like DTED, GeoTIFF, and Shapefiles. It can even dynamically create 3D terrain by streaming in elevation, imagery, and features to build up large areas and by cutting-in site models for high fidelity ground detail.



FEATURES

- VIEW MULTIPLE TYPES OF MAPS
- IMPORTS POLYGONAL DATABASES, RASTER MAPS, AND VECTOR DATA
- TACTICAL OVERLAYS
- TOOLKIT API FOR USER CUSTOMIZATION
- CONTOUR AND GRID LINES
- ENTITY, AGGREGATE, AND SENSOR DISPLAY
- DISPLAY VECTOR FEATURE DATA

USE CASES

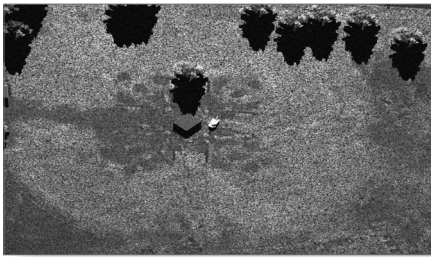
- AFTER ACTION REVIEW
- INSTRUCTOR OPERATOR STATIONS
- TACTICAL MAP DISPLAYS
- MISSION PLANNING
- COA ANALYSIS



Visualize: From Every Vantage Point

RadarFX SAR Server

RadarFX SAR Server produces Synthetic Aperture Radar (SAR) images of a simulated environment that can be populated with simulation activity. This system allows you to develop training applications for reconnaissance, surveillance, and targeting that benefit from the unique characteristics of SAR images without actually deploying an airborne system.



A Smart Marriage of Physics and Graphics

RadarFX SAR Server combines JRM Technologies' proven physics-based signature simulation with VR-Vantage's advanced rendering architecture. RadarFX produces accurate SAR scenes using radar returns from the terrain and radar cross sections from vehicles, munitions, and natural and cultural features. The resulting scenes are served to your applications to be presented to users in the proper training context. One RadarFX SAR Server can supply images for any number of client applications that request SAR images.

Correlated with Infrared, Night Vision, and OTW scenes

Because RadarFX SAR Server runs on the same spectral, material-property-encoded terrain and target database as is used for EO/IR wavelengths, the results are automatically fully correlated with the other sensor modes (e.g. NVG, MWIR, LWIR) in the SensorFX imaging sensor simulations. A default set of radar cross section data is provided to represent each simulated entity and you can add fidelity if you have your own RCS files.

Easy Integration into Your Simulation Architecture

Install RadarFX SAR Server on a computer in your network and it will serve SAR images to the applications that need them. The product includes a software toolkit to make an easy job of embedding SAR images into your applications.

SensorFX

SensorFX generates EO, IR, and NVG scenes by modeling the physics of light energy as it is reflected and emitted from surfaces in the scene and transmitted through the atmosphere and into a sensing device.



Extensive Sensor Coverage

SensorFX enables you to credibly simulate any sensor in the 0.3-16.0um band with VR-Vantage, including:

- FLIRs / Thermal Imagers: 3-5 & 8-12um.
- Image Intensifiers / NVGs: 2nd & 3rd Gen.
- EO Cameras: Color CCD, LLTV, BW, SWIR.