



VR-Vantage XR

First Experience

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VR-Vantage XR First Experience

Thank you for deciding to try out VR-Vantage XR. VR-Vantage XR provides an exaggerated reality (XR) common operational picture that combines traditional 2D tactical maps and 3D perspective scenes for viewing the virtual battlefield.

This first experience with VR-Vantage XR will be a quick guided tour of some its most important features. To get the full experience you will need:

- ♦ VR-Vantage XR
- ♦ MAK Data Logger.

Before you begin, install and license the software. Please see [“Install VR-Vantage XR and Supporting Applications and Data,”](#) on page 25 for instructions.

When you are ready, this guide will help you:

- ♦ [Explore the Terrain](#)
- ♦ [View a Simulation](#)
- ♦ [Attach the Observer to Entities](#)
- ♦ [Manipulate Objects in the Scene](#)
- ♦ [Explore the Plan View Observer Mode](#)
- ♦ [Explore Model Sets and Model Scaling](#)
- ♦ [Explore Streaming Terrain](#)
- ♦ [Continue to Explore VR-Vantage XR.](#)

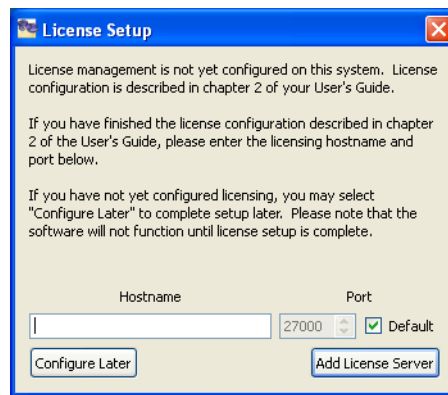
VR-Vantage XR is part of MÄK’s VR-Vantage product line. VR-Vantage XR is built using the VR-Vantage Toolkit. Using the toolkit, developers can extend the capabilities of our applications and can create entirely new applications. For more information, please read *VR-Vantage Developers Guide*, which is in the *./doc* directory.

1. Start VR-Vantage XR

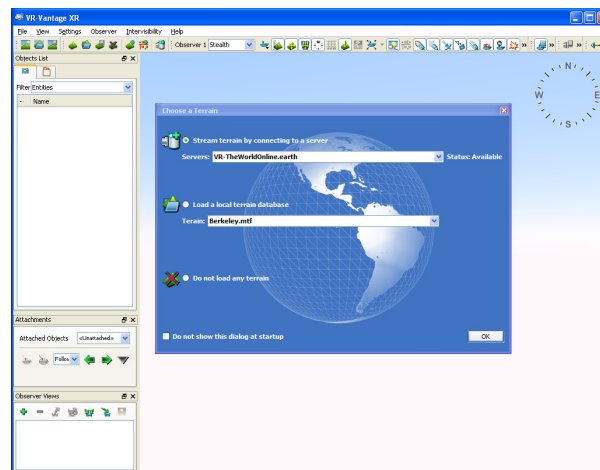
- On the Start menu, choose **Programs** → **MÄK Technologies** → **VR-Vantage 1.3** → **VR-Vantage XR**. VR-Vantage XR starts up. (The first time you run VR-Vantage XR, you will have to specify the license server.)

1.1. Specify the License Server

The first time you run a MÄK application on a computer, the License Setup dialog box opens. It prompts you to enter the hostname of the license server and optionally, a port number.



1. Type the hostname in the Hostname box. This is the name you gave your salesperson when you requested the license file. (For details, please see (Section B.1, “Identify the Host ID and License Server Name”).)
2. Click Add License Server. VR-Vantage XR starts. The Choose a Terrain window opens on top of the main window. It lets you immediately connect to a terrain server, load a local terrain, or decide not to load a terrain.



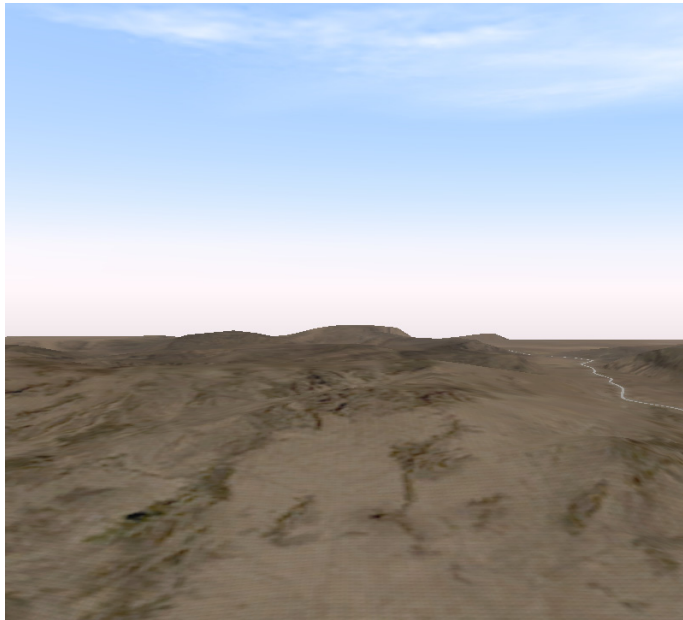


When you start VR-Vantage XR, if you receive the following message, it means that you did not install the data package:

```
Data package not found in specified data directory:  
'c:\MAK\vrvantagel.3\data'.  
Please make sure the data package is installed.
```

VR-Vantage XR has an application installer and a data installer. You must install both of them.

3. Select Load a Local Terrain Database.
4. In the list, select *VR-Village_NoSpeedTrees.mtf*.
5. Click OK. The VR-Village terrain loads. If the view does not look like the following illustration, press the **Spacebar**.



2. Explore the Terrain

The observer is your viewpoint into the terrain. You can navigate through the terrain using the keyboard and mouse. This section introduces the basic keyboard and mouse actions. For a complete list, please see online help or the Quick Reference Card in *VR-Vantage Users Guide*.

1. Hold down the **e** key. This drops the observer down into the village.



2. Hold down the **s** key to back through the village towards the entrance road. If the observer stops moving, it may be blocked by a building or terrain. Press **q** to raise the observer a bit.
3. Experiment with keyboard and mouse control of the observer as described in the next few sections.

2.1. Use the Game-like Keyboard Navigation

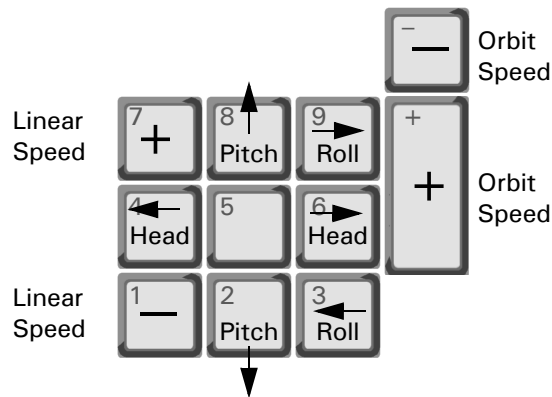
Press **w** and **s** to move forward and backward.
Press **e** and **q** to move up and down. Press **a** and **d** to move left and right.

Press multiple keys to combine movement modes. Notice that you cannot go through walls or through the ground — unless you want to. Press and hold **x** while moving the observer and you can go through walls and terrain.



Press the **Spacebar** to move the observer to the default starting point.

The keypad lets you control position and orientation.



2.2. Use the Mouse to Move the Observer

2.2.1. Drag the Terrain

Dragging the terrain moves the observer forward, backward, left, and right.

1. Click a point on the terrain and hold down the left mouse button.
2. Drag the mouse left, right, forward, and backward.

2.2.2. Drag the View

Dragging the view moves the observer up, down, left, and right.

- Hold down the middle mouse button (or wheel) and drag the mouse.

2.2.3. Change the Observer's Orientation

- Hold down the right mouse button and drag the mouse.

2.2.4. Teleport the Observer

- **Shift**+click someplace on the terrain to jump to the location.

2.3. Change the Environment

VR-Vantage lets you manipulate the environment. This just affects how the scene looks. It does not affect the simulation you are viewing.

2.3.1. Make it Rain and Snow

1. Choose **Settings** → **Scene**. The Scene Settings dialog box opens.
2. Select the Environment Settings page.
3. Select the Precipitation Enabled check box. It starts to rain.
4. On the Precipitation Type drop-down list, select Snow.



5. In the Precipitation Intensity box, change the intensity to .50.
6. Clear the Precipitation Enabled check box.

2.3.2. Add a Cloud Layer

1. Choose **Settings** → **Scene**.
2. Select the Environment Settings page.
3. Click the Add icon (+) to the right of the list of cloud layers. The Add Cloud Layer dialog box opens.
4. In the Cloud Type drop-down list, select Cumulus Congestus.
5. Click OK. See how the cloud layers change in the scene.

2.3.3. Change the Time of Day

1. Choose **Settings** → **Scene**.
2. Select the Date and Time page.
3. In the Time group box set the value using the spinner controls. See how the lighting changes as you change the time.

2.4. Save the Scene

1. Choose **File** → **Save Scene**. The Save Scene dialog box opens.
2. Type a name for the scene. Include the extension .msf.
3. Click Save.

3. View a Simulation

To view a simulation, you must load an appropriate terrain and connect to the simulation network. In this guide we assume that you have the MÄK Data Logger and the recorded simulations that it includes. However, if you want to view your own simulation data, feel free to use it instead of the suggested files.

3.1. Connect to a Simulation Network

1. Choose **Settings** → **Connection**. The Simulation Connections dialog box opens.
2. Select the DIS Connections page.
3. Click Connect.

3.2. Load the Terrain

If you have not already loaded the VR-Village terrain, as explained in “[Start VR-Vantage XR](#),” on page 2, load it now.

1. Choose **File** → **Open Terrain**. The Open Terrain dialog box opens.
2. Select *VR-Village_NoSpeedTrees.mtf*.
3. Click Open. In a few seconds, the terrain is displayed.

3.3. Start the Logger and Play a Simulation

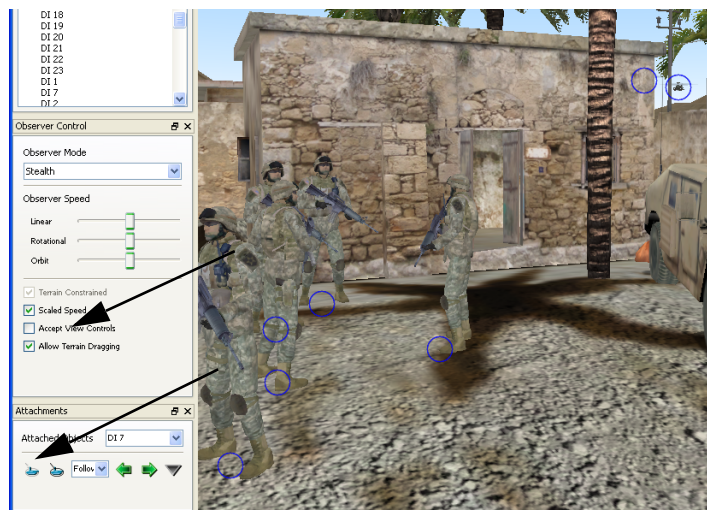
1. On the Start Menu, choose **Programs** → **MÄK Technologies** → **Logger X.X** → **Logger DIS**. The Logger starts.
2. Choose **File** → **Open**. The Open File dialog box opens.
3. Select *VR-Village-CarBombDemo-v3-DIS.lgr*. (If you are using Logger 4.3 or earlier, load *VR-Village-CarBombDemoDIS.lgr*.)
4. Click Open.
5. Choose **Play** → **Toggle Loop at End**. This will cause the recording to continuously loop back to the beginning when it reaches the end.
6. Choose **Play** → **Play/Pause**, or click the Play button.

3.4. View the Simulation

VR-Vantage XR will take a few seconds to load model files. Then it will start to display the action in this simulation. The Logger file sends view control messages to VR-Vantage XR to control the observer. Watch the simulation for a while. When you are ready to explore the simulation on your own, disable view controls.

3.4.1. Disable View Controls

1. Choose **View** → **Observer Control Panel**. The Observer Control Panel gets added to the set of panels on the left side of the window.
2. On the Observer Control Panel, clear Accept View Controls. Now, VR-Vantage XR will not respond to newly received view controls.
3. On the Attachments Panel, click the Attach/Detach icon. The observer stops following the entity to which it was attached.

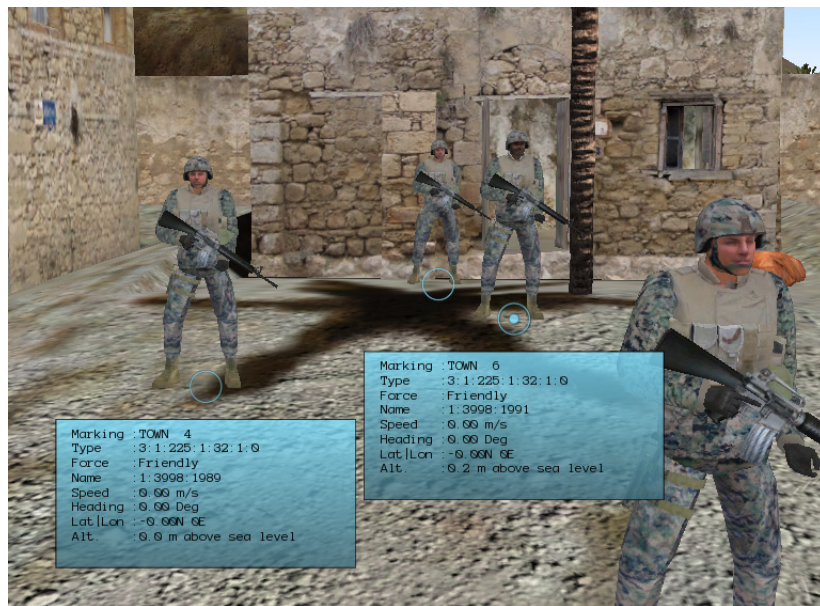


Use the navigation controls you learned earlier to navigate through the village and watch the simulation from the viewpoints that interest you.

3.4.2. View Entity Information

Entity labels mark an entity's location and provide detailed information about it.

1. Look at an entity. If it does not have a small circle on it (an entity label), choose **Settings** → **Entity Labels**. Entity labels are displayed for each entity.
2. Move the mouse cursor over an entity label. A panel displays entity details, as shown in the illustration.



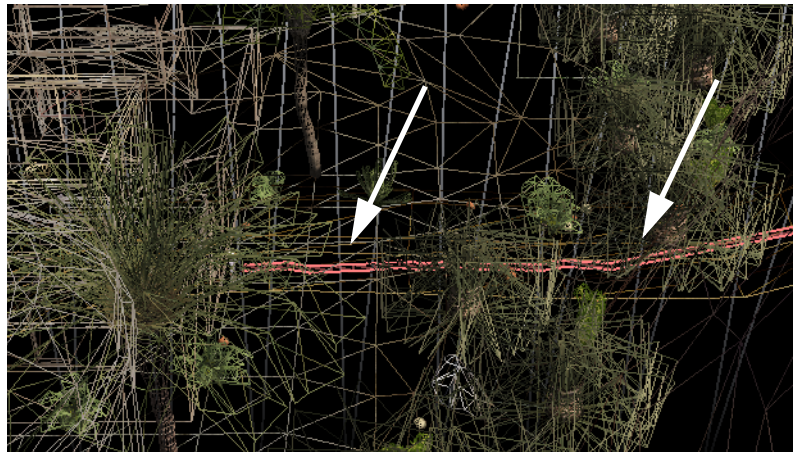
3. Zoom out from the terrain so that you can no longer easily see individual entities. You can still tell where they by looking at the entity labels.

3.4.3. View Track Histories

1. Press the **s** key to zoom out a bit from the village.
2. Choose **Observer** → **Track Histories**.
3. As entities move notice that they leave a track showing their path.



4. Choose **Settings** → **Wireframe Rendering**. The VR-Village terrain has underground passages. If entities are currently moving through the passages, you can see their track history.



5. Turn off Track Histories and Wireframe Rendering.

When you are done exploring VR-Vantage with this simulation, stop the Logger.

4. Attach the Observer to Entities

So far, you have moved the observer through the scene to observe entities and you have seen the view change as the result of view control messages. Those view control messages were moving the observer to static locations or attaching the observer to entities so that it moved with them. You can also attach the observer to entities manually.

1. In the Objects List Panel, right-click UtilRW 2. A popup menu is displayed.
2. Choose **Attach Follow**. The observer is now attached to the helicopter and is located to its rear. As the helicopter moves, the observer will move with it. You can change the position and orientation of the observer with the keyboard and mouse controls you learned earlier, but it will maintain its relationship with the helicopter and move through the scene as the helicopter moves.
3. Press . (period). The attachment moves to the next entity in the Objects List Panel.
4. Continuing attaching to additional entities.
5. Press **z** to detach the observer.

4.1. Attach to an Entity that has a Cockpit Display

VR-Vantage is based on OpenSceneGraph (OSG), so developers can integrate third-party modules that are built on OSG. GL Studio, from DiSTI, is an application for building cockpit displays (also called heads-up displays, or HUDs). VR-Vantage includes a set of these displays for different vehicle types.

1. In the Objects List Panel, right-click UtilRW 2. A popup menu is displayed.
2. Choose **Attach Mimic**. The observer attaches to the helicopter and its cockpit is displayed.



3. To see other cockpit displays, attach to SmWhel 1 and CivVeh 1 in Mimic mode.
4. Press **z** to detach the observer.

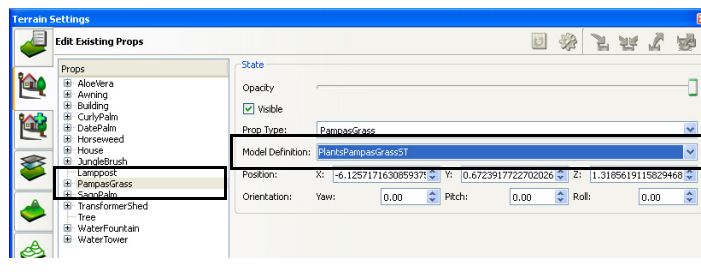
5. Manipulate Objects in the Scene

VR-Vantage lets you add value to terrains, even if you did not originally create them. In this exercise you will replace low fidelity models with high fidelity models. The *VR-Village_NoSpeedTrees.mtf* terrain uses low-fidelity models for trees and other vegetation. We will replace some of these models with SpeedTree models.

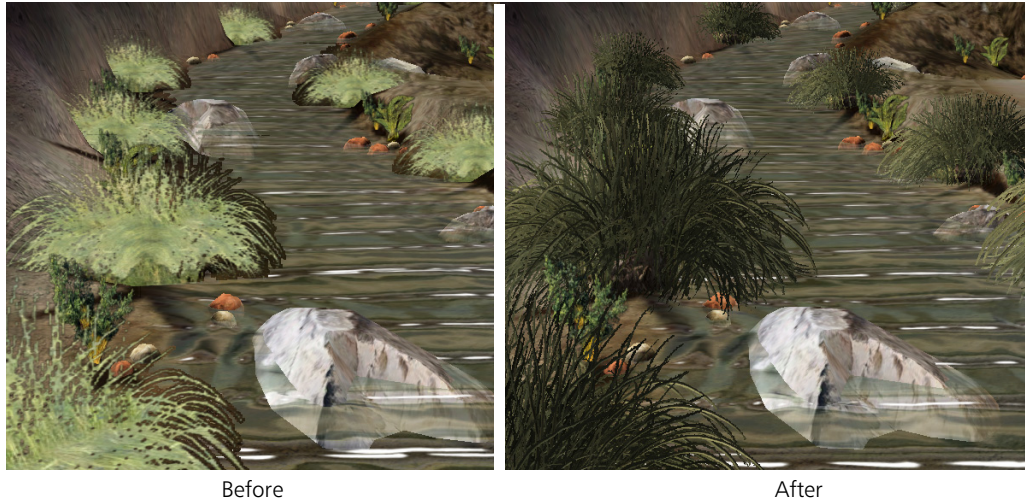
1. Press **z** to make sure the observer is not attached to any entities.
2. Press the **Spacebar** to return to the default view of the terrain.
3. Press **e** until the observer stops at the ground. You will be looking at a portion of VR-Village similar to the following illustration.



4. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens. (You might need to pull it to the side to see the terrain.)
5. Select the Props page.



6. In the Props list, select PampasGrass. Bounding boxes are displayed around the grass objects. You might want to zoom out and up a little to see more of them.
7. In the Model Definition field of the State group box, select PlantsPampassGrassST. This replaces the rigid low fidelity model with a SpeedTree model that sways in the breeze. See how much better the grass looks.



5.1. See Through Walls

You can control the transparency of walls so that you can see inside buildings.

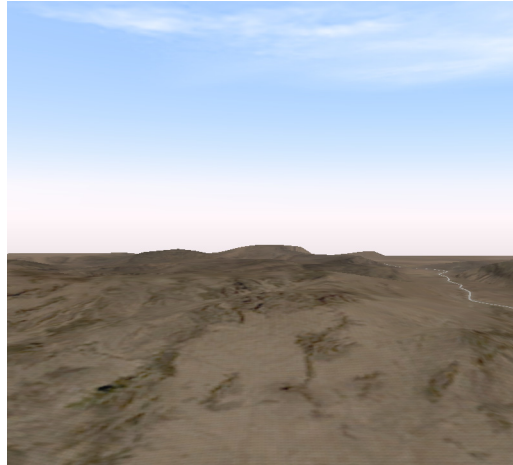
1. In the VR-Village terrain, click a building to select it.
2. Right-click. A pop-up menu is displayed.
3. Choose **Make Transparent**. The walls become approximately 80% transparent.
4. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens.
5. Select the Props page.
6. Note the setting for the Opacity slider.
7. Move the slider to increase or decrease the transparency of the building.

6. Explore the Plan View Observer Mode

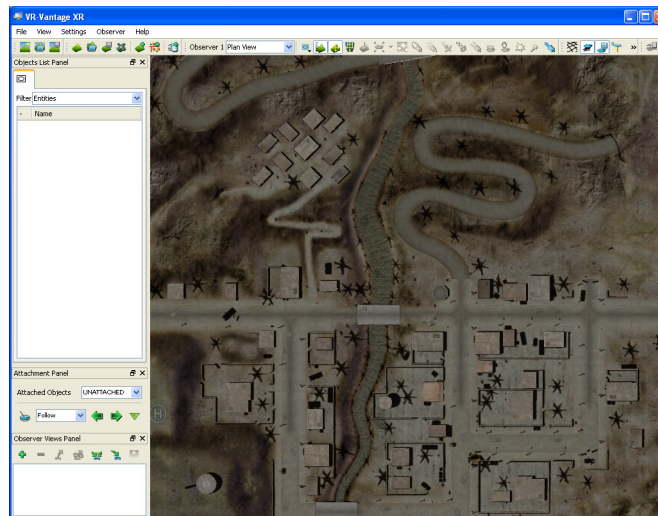
So far, we have been exploring VR-Vantage XR in its 3D projection. Now we will explore the 2D plan view mode.

6.1. Change the Observer Mode

1. Press the **Spacebar** to return to the default view of the terrain.



2. Choose **Observer** → **Set Observer Mode (Observer 1)** → **Plan View**. The projection changes to a plan view (2D).



6.2. Navigate the Plan View

The Plan View mode uses the same keyboard and mouse navigation as Stealth mode, except that you are restricted to 2D movement. Press **w** and **s** to move up and down. Press **e** and **q** to zoom in and out. Press **a** and **d** to move left and right. Press multiple keys to combine movement modes.



In Plan View observer mode, the altitude of the observer is fixed. When you zoom in and out, the altitude is not changing; the extents of the visible database and the resolution change.

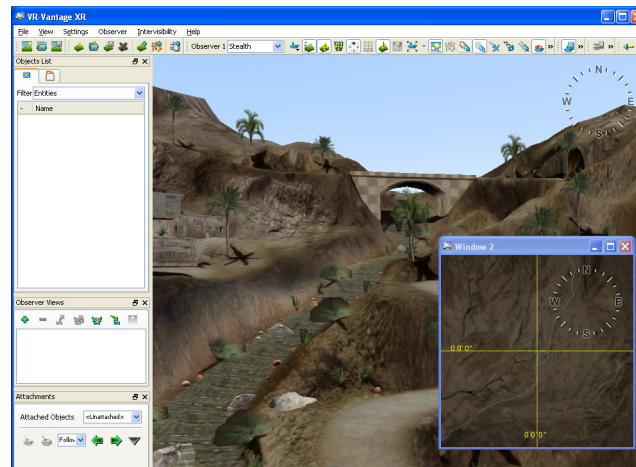
The Left Arrow and Right Arrow keys rotate around the center point. Press the **Spacebar** to move the observer to the default starting point.

Drag the terrain with the left mouse button. Rotate with the right mouse button. Zoom in and out with the scroll wheel.

6.3. View 3D and 2D Together

VR-Vantage applications can display multiple windows. Each window has its own observer. The projection used in a window is a property of the observer, so you can set the observer mode individually for each window you have open.

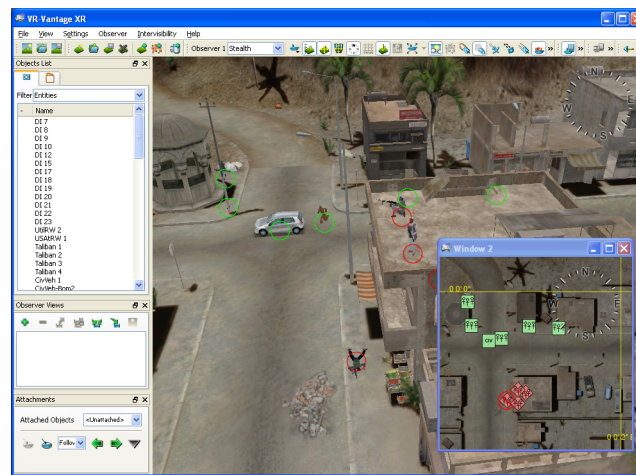
1. Choose **Observer** → **Set Observer Mode (Observer 1)** → **Stealth**. (This is to get the main window back into Stealth observer mode.)
2. Choose **File** → **New** → **Plan View Window**. A new window opens. It is titled Window 1 - Plan View. Notice that it uses the Plan View observer mode.



3. Select the Plan View window to make it active. Then navigate through the terrain. Changing the observer's location in this window does not affect the observer in the main window.
4. Choose **Observer** → **Set Observer Mode (Observer 2)** → **Stealth**. The window now uses a 3D projection. You may need to press the **Spacebar** to reset the view.
5. Practice switching between the two windows and changing the observer modes.

6.4. View the Simulation in Stealth and Plan View Observer Modes

In the Logger, start playing the simulation again. View it in the 2D and 3D views.



Navigate the simulation as desired. The different projections have different visual effects.

1. Select the window using Stealth observer mode.
2. Look at the Observer menu and see the list of visual effects that you can turn on and off.
3. Select the window in Plan View observer mode.
4. Look at the Observer menu. The 3D visual effects are not available. Only effects that make sense for a 2D view are available.

6.4.1. Change the Icon Size

As we noted in the model scaling section, you can change the size of entity icons.

1. Choose **Settings** → **Display**. The Display Settings dialog box opens.
2. Select the Entity Display Settings page.
3. In the Icon Settings group box, adjust the Icon Scale slider to increase or decrease the size of the icons.

7. Explore Model Sets and Model Scaling

By default, the Stealth observer mode uses realistic, textured, 3D models. These models are collectively known as the 3D Models model set. However, VR-Vantage XR has other model sets (you used the 2D Icon model set when you switched to Plan View observer mode in the previous section) and it also lets you scale the models so that you can see them when the observer is too far away to see realistically scaled models.



A model set is just a set of models of a particular type or style.

To set up VR-Vantage XR for this section:

1. Choose **File** → **New** → **Terrain**.
2. Open the *SanLuisObsipo.mtf* terrain (as explained in [“Explore the Terrain,”](#) on page 4).
3. If VR-Vantage XR is not connected to the network, connect to the DIS network (as explained in [“Connect to a Simulation Network,”](#) on page 7).
4. Turn off view controls (as explained in [“Disable View Controls,”](#) on page 8).
5. In the Logger, load *IISEC_VPMM_Demo_Final-DIS.lgr* and play the recording (as explained in [“Start the Logger and Play a Simulation,”](#) on page 8).



The scenario for this part of the evaluation was made with high fidelity air combat models plugged into VR-Forces, MÄK’s computer generated forces product. In this scenario, a friendly fighter (GenFLT 1) is escorting a cargo plane (C-130 1). Two opposing force fighters (FtrFW 1 and FTRFW 2) threaten the convoy. The fighters engage and GenFLT 1 shoots down the opposing fighters. Several minutes later, GenFLT 1 launches flairs in response to an attack from a surface-to-air missile battery (SAM 1).

6. If entity labels are not enabled, choose **Settings** → **Entity Labels**.

7.1. Scale the Models

1. [Figure 1](#) shows the default view of the San Luis Obispo terrain at the starting point of the Logger recording. Although the entity labels indicate that there are entities present, you really cannot see any of them clearly because they are scaled to the terrain and the observer is too far away to make out details.



Figure 1. San Luis Obispo, entity labels visible

2. In the Objects List Panel, right-click GenFlt1 and choose **Attach Tether**. Now, you can see the entity to which you are attached, but you still cannot see the distant entities except as entity labels ([Figure 2](#)). To remedy this problem we can use the XR observer mode and VR-Vantage XR's model scaling feature – we can exaggerate reality.



Figure 2. Attached to GenFlt 1

3. Choose **Observer** → **Set Observer Mode** → **XR**, or select XR on the Observer drop-down list on the Observer Settings toolbar. Notice that you can now see models for the red aircraft ([Figure 3](#)). By default, XR observer mode uses 3D colorized models and enables model scaling. Colorized models are not realistic, but they stand out from the background. Combined with model scaling, they become highly visible.

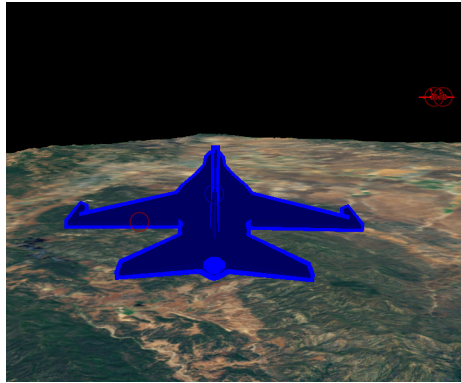
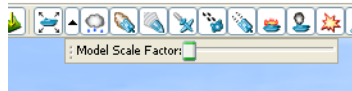


Figure 3. 3D Colorized Models

4. Click the down arrow on the Model Scaling icon (🔍) on the Observer Settings toolbar. The Model Scale Factor slider is displayed.



5. Slide the control to the right. The size of the models increases, as shown in [Figure 4](#). Compare it to [Figure 3](#). Note that while the red entities are quite a bit larger, the blue jet has not changed its size. Scaling of entity models is influenced by their distance from the observer. Models that are close to the observer might not be scaled at all.

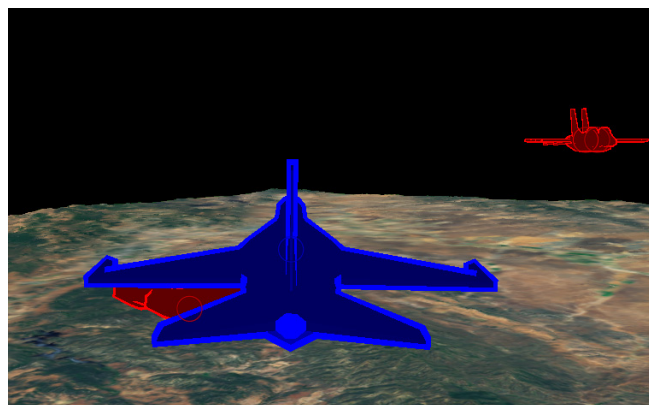


Figure 4. 3D Models, scaled

- Experiment with adjusting the scale factor. Move the observer and see how that affects model scaling.

7.2. Change the Model Set

Each observer mode has a default model set that meets the visualization goals of that mode – realism for Stealth observer mode; visibility for XR observer mode; two-dimensionality for Plan View observer mode. However, in any observer mode, you can switch to any of the other model sets. You have seen the current view of the scenario using 3D models and 3D colored models. Now try 2D icons.

- Choose **Observer** → **Set Model Set** → **2D Icons**. The entity models change to MIL-STD 2525B icons (Figure 5). The 2D icons are not affected by model scaling (but you can change their size, as described in “Change the Icon Size,” on page 17). They sit on top of the scene, so they are not blocked by terrain or buildings as the 3D models are.



Figure 5. 2D Icon model set

Now that you have seen the different model sets and model scaling, explore these features on your own. Figure 6 illustrates this scenario looking down at the terrain. It shows that you can scale 3D models as well as 3D colored models (although they are still harder to see than colored models).



Figure 6. Top down view

8. Explore Streaming Terrain

In addition to displaying local static terrain databases, VR-Vantage XR can stream data from a terrain service or files stored locally.

8.1. Connect to a Terrain Server

1. Choose **File** → **New Terrain**. The loaded terrain is cleared.
2. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens.
3. Select the Terrain Contents page (Figure 7).

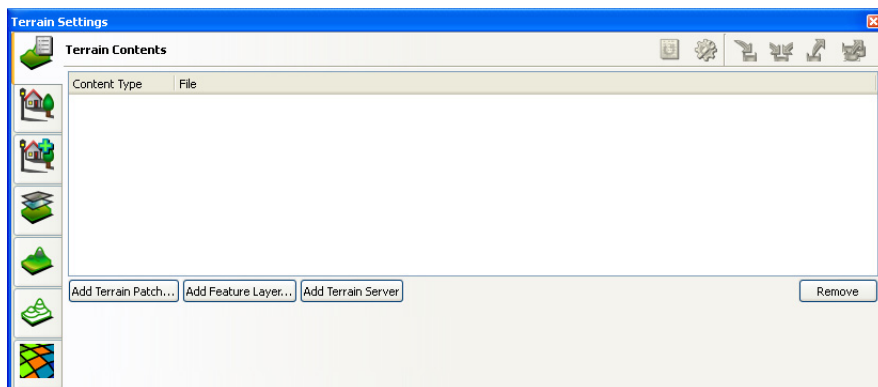


Figure 7. Terrain Contents

4. Click Add Terrain Server. The Add Terrain Server dialog box opens (Figure 7). The dialog box contains information about the selected terrain server. It is not editable.
5. Select VR-TheWorldOnline.earth¹ from the Servers drop-down list.
6. Click Connect. The whole earth is displayed.



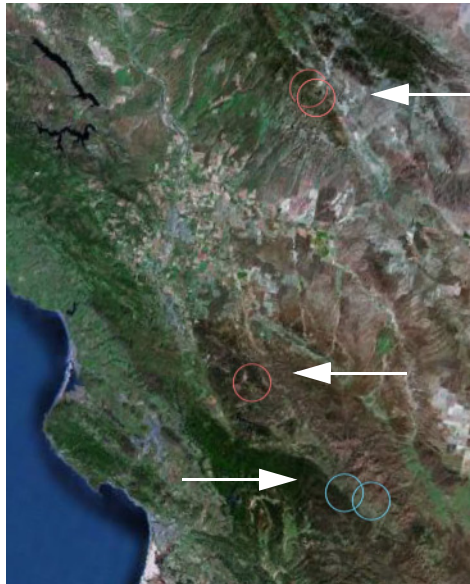
1. VR-TheWorld is a terrain server hosted by VT MÄK. If you access a different server, please note its terms of service. Many commercial sites like Google, Yahoo, and ESRI have specific restrictions on commercial use. It is your responsibility to abide by these terms.

8.1.1. Navigate the Earth

Use the keyboard and mouse to navigate the display. Zoom in and out. As you zoom in, more detailed terrain is displayed.

8.2. View a Scenario

If you are not running the *IISEC_VPMM_Demo_Final.lgr* file, play it now. Use the navigation controls to rotate the earth until you are viewing the west coast of North America. Zoom in to see the central coast of California. You can see entity labels for the entities in the simulation. (This is the same view as in [Figure 6](#). It simply uses a different terrain. If you want to, you can experiment with all of the observer and model set changes you tried out in previous sections and see how they compare on this terrain.)

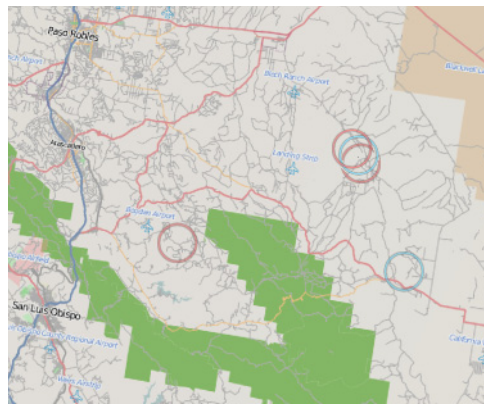


8.3. Change the Data Stream

You can change the data stream you are using without disconnecting from the simulation.

1. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens.
2. Select the Terrain Contents page.
3. In the window, select VR-TheWorldOnline.earth.
4. Click Remove.
5. Click Add Terrain Server.
6. Select OpenStreetMap Example Online.earth.
7. Click Connect.

The earth will now be covered in map data as it streams in, as shown in the following figure.



When you are finished exploring streaming terrain, stop the Logger.

9. View a Terrain Agility Tutorial

VR-Vantage XR lets you load terrains created in terrain creation applications, such as OpenFlight files. However, you can also create terrains from elevation, feature, and imagery data. To see how:

1. Choose **Programs** → **MÄK Technologies** → **VR-Vantage 1.3** → **Documentation** → **VR-Vantage Video Tutorials**. A page opens in your web browser.
2. Click the first link in the list and follow the chain of videos.

10. Continue to Explore VR-Vantage XR

Continue to explore VR-Vantage XR. Look at the various settings options on the Settings menu. For more information, please read *VR-Vantage Users Guide* or online help. They provide detailed descriptions of all VR-Vantage XR features.

- To open *VR-Vantage Users Guide*, choose **Programs** → **MÄK Technologies** → **VR-Vantage 1.3** → **Documentation** → **VR-Vantage Users Guide**
- To open online help, choose **Help** → **Help**.

Please contact sales@mak.com for additional assistance or to provide feedback.



Installation and Licensing

Your MÄK salesperson has given you a link to the VR-Vantage XR installer as well as links to other MÄK applications and data to support your first user experience. Download the files. Before you install the applications, note the following possible issues:

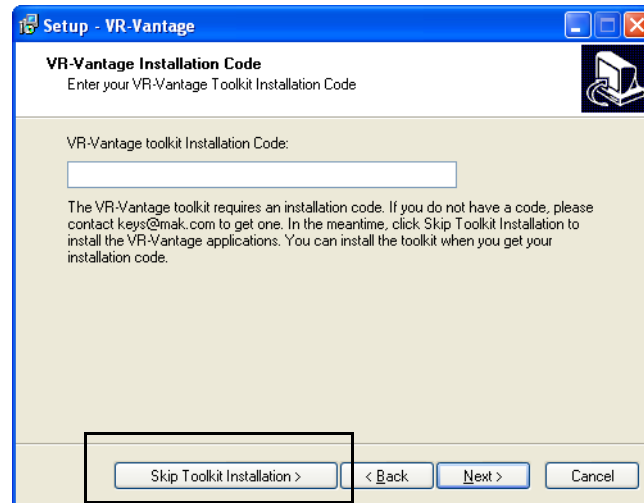
- ♦ You must have administrator privileges to install VR-Vantage on Windows Vista.
- ♦ When you install VR-Vantage on Vista, there may be a delay of up to several minutes from the time you try to run the setup program to the time that an installation dialog box is displayed. If you experience this problem, turning off User Access Control can reduce or eliminate this delay.
- ♦ These instructions assume you are familiar with installing Windows applications that use a wizard-style installer. They also assume that you have an unzipping application and know how to use it.

A. Install VR-Vantage XR and Supporting Applications and Data

Installing VR-Vantage XR is a two-step process.

To install VR-Vantage XR:

1. Run the application installer. On the VR-Vantage Installation Code page, click Skip Toolkit Installation.



2. Run the data installer. When the installation wizard asks if it is OK to install in the existing VR-Vantage XR directory, click Yes.

If you do not already have the MÄK Data Logger installed, install it as follows:

- Run the MÄK Data Logger installer. Accept all of the default settings.

If you installed MÄK Data Logger 5.0, you do not have to extract the *IISEC_VPMM_Demo_Final.lgr* recording. It is included in the Logger installer. If you have a previous version of the Logger, extract *IISEC_VPMM_Demo_Final.lgr* as follows:

- Extract *IISEC_VPMM_Demo_Final.lgr* from *IISEC_VPMM_Demo_Final.zip* to *C:/MAK/Loggerx.x/logger_tapes*.

B. Setting Up the License Manager

To use a MÄK product, you must install the License Manager and get a license for your product. Before you can use a MÄK product, you must obtain a valid license file and specify the license server.

► To install the License Manager, run the installer.

The general procedure for configuring license management is as follows:

1. Identify the name and ID of the license server and request a license file.
2. Put the license file in the *MAK/LicenseManager* directory on the license server.
3. Run the license server.
4. Specify the license server location.

B.1. Identify the Host ID and License Server Name

For simplicity, use the computer on which you installed VR-Vantage XR as the license server. To find out the host ID and license server name:

1. On the Start menu, choose **Programs** → **MAK Technologies** → **LicenseManager** → **Imtools**. The LMTOOLS application opens (Figure 1).

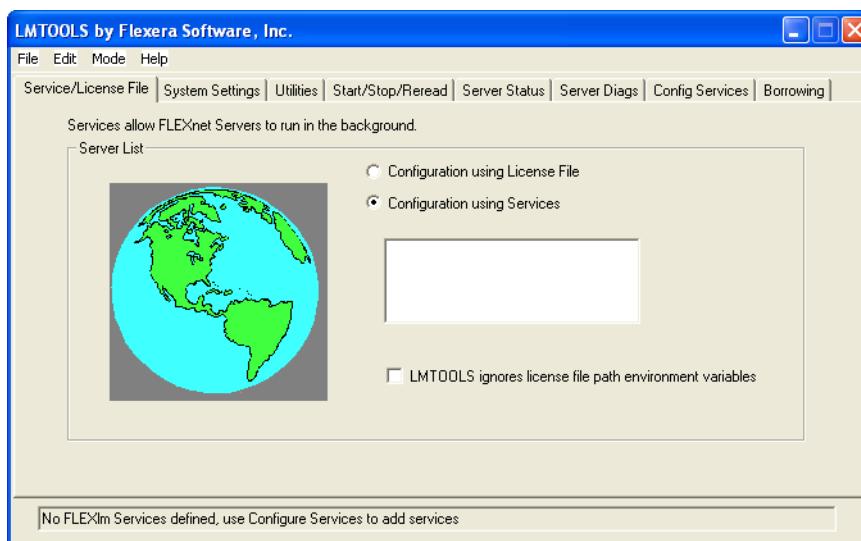


Figure 1. Imtools

2. Select the System Settings tab. The host ID is the string in the Ethernet Address text box. The license server name is the name in the Computer/Hostname text box.
3. Send the host ID and hostname to your MÄK salesperson. MÄK will e-mail you a license file.

B.2. Put the License File in the *LicenseManager* Directory

When you receive your license file, put it in the *LicenseManager* directory on the license server. The file should have the extension *.lic*. If it does not, please contact keys@mak.com to clarify why it did not follow this convention.

B.3. Run the License Server

- To start the license server daemon, on the server machine only, execute `runLm` from the *LicenseManager* directory.

2.3.1. Shutting Down the License Server

- To force all applications to check in their licenses and shut down the license server daemon, run `lmdown`.

B.4. Specify the License Server

The first time you run a MÄK application on a computer, the License Setup dialog box opens (Figure 2). It prompts you to enter the hostname of the license server and optionally, a port number.

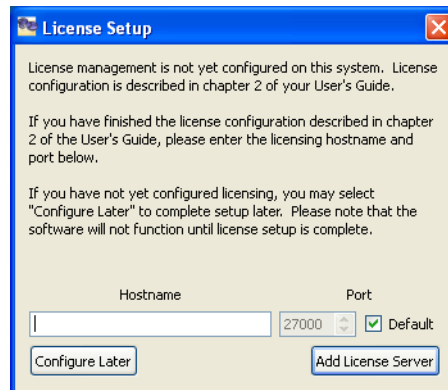


Figure 2. License Setup dialog box

1. Type the hostname in the Hostname box.
2. Click Add License Server. The application will start.