

April  
2019

# What's Up MAK

Taking the next  
step

Adding detail to  
Kilo2 in the  
MAK Earth

Are you  
maximizing the  
power of VR-  
Forces?

Tech Tip: Using  
Scenario Events to  
Trigger Simulation  
Action

April Fools:  
VR-Actuality,  
MAK's newest  
product

C2SIM update  
from SIW 2019

NewsMAKers



## Taking the next step

*28 years in, MAK's strong foundation sets the tone for some great developments that are here today, and even more for tomorrow.*

It's that time of the year again - springtime at MAK means recent or imminent upgrades to the entire MAK product suite. We continue to push for new capabilities in our software, while improving the seamless integration between our products and our customers' systems. MAK has been involved in the simulation world for 28 years, and we have enjoyed incredibly long, mutually prosperous relationships with our customers.

This year, we're focused on rewarding our customers' loyalty with three main objectives: developing more synergies between products, introducing new possibilities with VR-Engage and VR-Forces, and elevating VR-Vantage to the highest altitude of flight IGs.



## Synergies between products

When we create new additions or improvements to the suite, it's always with the idea in mind that the whole is greater than the sum of its parts. Combining MAK products side-by-side into a system provides all kinds of benefits for system integrators. When MAK products are selected, you can be sure that the interactions between a system's Terrain, Simulation Engine, First-person Player Stations and Interoperability tools all perfectly correlate with high-performance visuals in a complete, unified virtual environment. A system built on the MAK Suite means a unified virtual training environment and a smooth workflow throughout the simulation; planning phase, run-time and after-action.

## New possibilities for VR-Engage from improvements in VR-Forces and VR-Vantage

We have expanded the roles available in VR-Engage to include a brand-new Sensor Operator option, which gains additional capabilities when combined with VR-Forces. It's easy to create and insert entities with sensor pods in VR-Forces, and take control of them with VR-Engage. With VR-Engage, it's simple to add a gimbaled sensor to any DIS or HLA entity in your simulation, such as a UAV, ship, or manned aircraft.

We've made demos that spotlight product crossover as well as their combination. One demo features a group of soldiers that fire a tripod-mounted missile at a convoy and another is a shipboard weapons trainer. In both cases, improved AI behaviors in VR-Forces cause realistic responses to attack, creating high-fidelity challenges for the trainees in VR-Engage. The combination of software allows an instructor to take command of an entity to provide specific countermeasures, or quickly add new entities or trigger scenarios on the fly. [We've just released a video that shows both of these demos, and you can check them out on MAKtv.](#)

MAK's virtual reality support has made a leap, thanks to display improvements in VR-Vantage. Those improvements in our visual software are implemented by VR-Engage using the power of Vantage API to provide an immersive experience for players. MAK has added a high-fidelity 3-D fighter aircraft interior model, with real geometry for switches and buttons, and working instruments rendered onto 3-D panels for a truly immersive VR flight simulation experience.

## Taking VR-Vantage to new heights

We continue to develop VR-Vantage, making substantial internal architectural changes to amplify its performance. While those changes are significant, we have taken care to not significantly alter the VR-Vantage API and configuration, so longtime customers can follow a straightforward and smooth upgrade process.

Performance of OpenFlight and MetaFlight terrains have been noticeably improved. Terrains built by offline tools now take advantage of rendering techniques – Indirect Rendering, Bindless Textures, and advanced Occlusion Culling – that were previously only used in procedurally-generated terrains.

We have overhauled the API used to control and produce sound in VR-Vantage to make it easier to extend to meet program needs, and added the ability to generate streaming H265 video using on-board GPU hardware to drive high performance and high pixel count displays.

As 2019 develops, MAK will continue to display the same industry leadership that we've exhibited for the past 28 years. Every day, we see our customers build their systems confidently on the building blocks made by MAK. Still, we're as excited as can be to develop ever better tools, and watch with awe as our customers win more bids and build ever greater systems.

## Adding detail to Kilo2 in MAK Earth

MAK's software comes out-of-the-box with pre-built terrain databases. One of those databases, California Online, has received an influx of new data that provides new detail to the Kilo2 MOUT site at the Camp Pendleton Marine Corps base. This is a new addition to our family of highly detailed sites like Range 220 at Twentynine Palms.

With the latest version, the Kilo2 area has been developed as a hand-modeled geospecific inset with first-person ground-level fidelity. Specific land use data for Kilo2 yields accurate roads, trails, soil, and vegetation. All buildings in the terrain represent actual buildings in the real-world Kilo site, with interiors. Kilo2 also now contains destructible buildings and dynamic lights. In addition to this new content, the terrain has been optimized for performance, so customers can enjoy all this new detail without worrying about changing hardware.



Want to learn more about [MAK Earth](#)?

## Are you maximizing the power of VR-Forces?

At MAK, our product features reflect our dedication to our customer's needs. Here are two features in VR-Forces that you might find helpful:

### VR-Forces animates human characters as they get in or out of vehicles

When it comes to training aerial surveillance and tracking of humans in urban environments, it's important that the simulation can model the behavior of people trying to evade that surveillance. Different interactions within the environment require different levels of visual fidelity. A scenario in VR-Forces can, for example, simulate a subject leaving a crowded pedestrian way, opening a door and going into one building then coming out of another building before opening a car door, getting in and driving off. In this scenario, a sensor operator needs to see realistically behaving crowds of people and smooth animations of people getting into and out of cars, but the underground transit between buildings doesn't need to be seen at all. The modeling and animation capabilities of VR-Forces provide a high level of fidelity for sensor operator training.

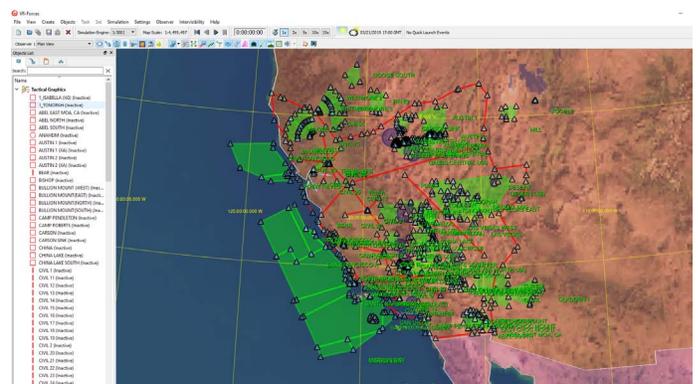


*Click on the play button above to observe a character animation of getting into a vehicle.*

### Airspace Control Orders (ACOs) can now be imported directly into VR-Forces

A time-consuming part of generating Air Tasking Orders (ATOs) is the specification of the geometry associated with Airspace Control Orders. Entering the ACO information manually would be a time-consuming process. Instead, VR-Forces can import US and coalition force ACOs in standard data formats from fielded systems. Once the ACO data has been imported, standard-format tactical graphics are displayed onscreen, and users can immediately use them to develop or refine Air Tasking Orders.

Want to learn more about [VR-Forces](#)?



# Using Scenario Events to Trigger Simulation Action

By Fred Wersan

When VR-Forces added 'scenario events' back in release 4.3, the intent was to support a Master Scenario Events List (MSEL). In operations-based or discussion-based exercises, a MSEL provides a timeline and location for expected exercise events and injects actions that push the scenario forward.

Scenario events in VR-Forces can present text, video, graphics, audio, or a combination of these media types, at preplanned times in the simulation or when injected by an operator. Imagine a scenario that models an emergency response. The instructor might plan out events to pop up a video showing a news report of the disaster, followed by text prompts to the users instructing them to respond accordingly. Used this way, scenario events influence the participants in the simulation, but do not directly affect the behavior or plans of the entities being simulated by VR-Forces.

Because you can test the status of a scenario event using the conditional statements in plans, simulation events can also be used, with or without content, to trigger simulation actions. You can also change the status of a scenario event from a plan, thus triggering the behaviors of any entities testing that status. Consider an entity whose plan would change the rules of engagement to 'fire at will' when the event called "Attack" was started.

Most of the conditions that plans can test for have to do with the status of entities, such as their location or resources, but sometimes you want to trigger events independently of these entity states. Or maybe you want to test something for which VR-Forces does not have a built-in condition. Scenario events, which are not tied to a particular entity, allow you to work around these constraints.

Scenario events are very convenient for instructors to use. You can put them on the Events Toolbar and start them with a mouse click. If you are using them to trigger entity actions, you don't even have to add any content to them. The mere fact that an event is active is all the simulation engine needs to act.

Scenario events also give VR-Engage users a convenient way to influence VR-Forces scenarios. If a VR-Forces scenario has scenario events and you load it in VR-Engage, VR-Engage players can trigger the events from the Action menu of the character they are playing. If a scenario event has content, the VR-Engage player will not see the content, but any entity behaviors that get triggered by the event will take place among the entities being controlled by VR-Forces.

In summary, scenario events have proven to be a versatile and useful tool for stimulating human participants and triggering entity actions in VR-Forces scenarios.

Looking for more Tech Tips? Take a look at the [MAK blog](#).

## What's new on **MAKTV**

VT MAK



### **April Fools' Day! MAK Launches a new product: VR-Actuality!**

*For almost three decades, VT MAK has been a leader in simulation, 3D graphics, and virtual reality software, and we have recently incorporated augmented-reality and mixed-reality technology to bring ever-increasing realism to our virtual environments. Today, we announce our new breakthrough technology – VR-Actuality!*

*VR-Actuality allows you to physically travel to geo-specific locations represented by our MAK Earth terrain databases – putting yourself into the game!*

# C2SIM update from SIW 2019

By Doug Reece

Military commanders use Command and Control (C2) systems to construct plans, issue orders, communicate status reports, and view operational pictures of the battlefield. Commanders see potential benefits of connecting simulators to C2 systems both to support command staff training and to allow staffs to wargame potential courses of action in operational settings. Connecting systems is easier said than done, however, since there are many different C2 systems and simulators produced by different organizations in different countries. For the coalition of systems to be effective, they must use common, unambiguous definitions of scenario data and the terms in orders and reports, and communicate in a standard protocol. To solve this problem, the Simulation Interoperability Standards Organization (SISO) is developing a standard for C2 System to Simulation Interoperation (C2SIM).

For the past year and a half, VT MAK has taken an active role in the C2SIM Product Development Group (PDG) as the leader of the team that is developing the ontologies. MAK is also supporting George Mason University in its development of a C2SIM "sandbox," which is a suite of software components that C2SIM developers will be able to connect to in order to test their own implementations. The sandbox will include the GMU server described above, and a C2SIM simulation system that is composed of VR-Forces and a C2SIM interface. The C2SIM interface will send and receive C2SIM messages, and use the VR-Forces Remote Control Interface to load terrain, create units, task units, and monitor reports.

After many years of investigations, development, and trials, it seems that a single standard for automating the initialization of scenarios in a C2-simulation environment and automating the communication of operational messages between these systems is finally coming to fruition.

## NewsMAKers

### Upcoming training classes:

[VR-Forces Training \(On-site\)](#)

Date: JUN 3 - JUN 7

A week-long class designed to guide students through VR-Forces. Please contact your sales rep to sign up.

### Upcoming events:

Come see when MAK will be in your area on our [events page](#)! In April, we'll be at [LAAD](#), [ESMIC Scientific Fair](#), [MODSIM World](#), [AUVSI](#), and [FAMEX](#).

### MAK in the news:

Antycip Simulation announced that it has entered into a long-term partnership with MBDA, a European leader in missile systems. This partnership will allow Antycip to provide specialized simulation software, services and support to MBDA in Italy. [See how Antycip Simulation is using MAK's software suite to build MBDA's bespoke Battle Labs.](#)

### Jobs @ MAK:

We're hiring! Check out our [MAK careers page](#) and see the requirements for Software Quality Assurance Engineer and Software Engineer.