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What's Up MAK

Battle at Sea!

We walk around an illustrated shipboard weapons training system!

New Supported Platforms; New MAK Data Pack

We support the latest and greatest platforms.

MAK at ITEC

See what to expect from MAK at ITEC, inside the Antycip stand.

NewsMAKers

We're releasing VR-Engage, putting out our latest podcast, and we've updated our events page!



Battle at Sea!

MAK's products are always being developed with an eye for flexibility, extensibility, and customizability. We recognize that system integrators have to build systems that fall all over the spectrum, whether it be for land, air, or sea, and for many different purposes. Our role is to give integrators the tools they need to succeed, and make sure those tools are malleable enough to unleash an integrator's skills and creativity, not inhibit them.

Our tech-savvy style helps us walk around almost any system, clearly designating where MAK parts live and how they help make the system work. We hope our illustrations help to give integrators new ideas to implement those components, and how they can customize MAK products specifically for their own project.

Today, we explore an illustration of a shipboard weapons training system that one may build featuring MAK products with unique customizations.



Shipboard weapons training systems focus on developing coordination and firing skills amongst a gunnery unit in order to defend maritime units from all manner of hostile forces. When it comes to appropriate levels of fidelity, it is important to develop a system that replicates the firing process, accurately renders weapon effects, and instills the environmental accuracy of operating on a ship in motion. In addition, the training system must stimulate the defensive unit with appropriate threats.

In this particular illustration, three gunnery positions and a weapons commander receive the training. They are supported by a helicopter threat station and a UAV control station. The instructor/operator station oversees and participates in the simulation.

Our trainees are inside of a projected dome that gives all three gunners and the weapons commander an immersive first-person view from the deck of the ship, with realistic ocean waves, sky and clouds, and terrain in the distance. The dome gives sufficient detail for the weapons commander to spot and identify approaching threats. The gunners use proprietary high-fidelity mockups of the weapons at each of their stations, and all trainees are perched on a motion platform that replicates the sway and motion of the moving ship, correlating its motion with the environment the trainees take in visually. The weapons commander wears headphones for communication with the pilot of a surveillance UAV employed by the ship to extend its visual range and capacity.



The simulation that powers the trainees' area runs two copies of **VR-Forces**, one of which is positioned some distance away, near the Instructor/Operator station. In this case, the system integrator has taken advantage of VR-Force's extensibility to add a high fidelity buoyancy model and drive the actuators under the platform to accurately simulate the motion of a



moving ship. To take that extensibility one step further, the system integrator has used a second copy of VR-Forces extended to give the gunners proprietary weapon hardware mockups and plug in a high-fidelity weapons interaction model to calculate the accuracy and effectiveness of each shot.

VR-Vantage IG lives inside of a rack directly behind the projection dome, and ties into the same VR-Forces simulation. VR-Vantage creates the rich, beautiful view from the deck of the ship that is shown inside the dome – maintaining the visual impact and performance required to maintain the trainees' sense of immersion.



Outside of the trainee area, we find two role player stations. The first is the UAV ground control station that is conducting surveillance on the area via a sensor-equipped gimbal-mounted payload. The commander uses a joystick to control the the visual frame, while employing optical, night vision, and infrared sensors to spot approaching hostile actors. Once identified, they radio that information to the weapons commander via headset.



To bring the UAV ground control station to life, the system integrator uses a copy of VR-Vantage to give the commander the view from the gimbal-mounted sensor payload. In this case, VR-Vantage takes advantage of MAK's **SensorFX** plugin. SensorFX uses physics-based modeling to increase the fidelity of the sensor views, with accurate materials classification and heat maps. The system integrator pairs this visual setup with VR-Forces for control.

The other role player is set up as a helicopter station for simulating threats. The operator uses off-the-shelf controllers to fly the helicopter to create a more lifelike target for the gunners.

The system integrator builds this station with **VR-Engage**, which easily allows human players to occupy and control simulation entities. VR-Engage gives the pilot great first-person out-the window views and re-creates the flight experience well. The pilot can operate custom controls on a touchscreen sitting in front of him. This system integrates easily with the custom helicopter control mockup the integrator is incorporating.



Finally, we come to the Instructor/Operator station (IOS), the most versatile position in the system. The instructor wants to develop the scenario before training begins, adding friendly and hostile entities, as well as background traffic. They need to determine which entities will be AI and which will be human operated, or whether and when control may be transitioned between them. As the training begins, the instructor will continue to change the action of entities in real time, when appropriate, providing variation to maximize learning for the trainees. Top-down 2D views of the scenario provides context when they are observing unit activity, but the instructor also uses 3D Stealth views to observe gunner performance. When necessary, the instructor takes first-person manual control of an entity to add human variability to its actions.

To give the IOS all this functionality, the system integrator packed it full of MAK products. By running its own copy of VR-Forces that correlates with other copies powering the trainee area, the instructor can easily develop scenarios prior to training, or alter them during live action. VR-Forces gives the instructor/operator informative 2D views of the scenario.

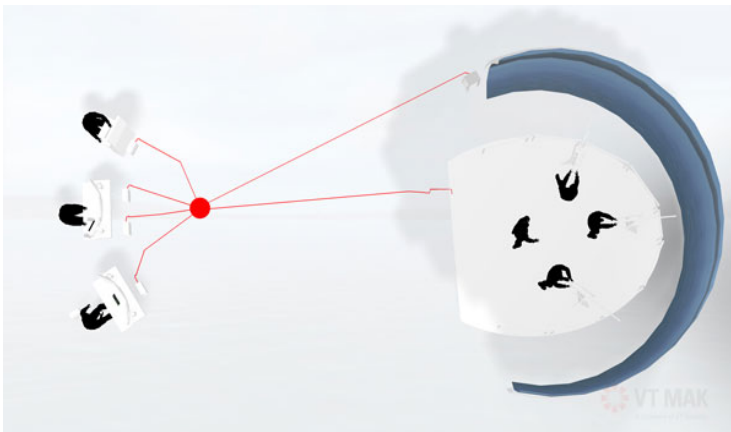
The integrator adds **VR-Vantage Stealth** to give the instructor a 3D third-person perspective on any part of the scenario, from the vantage point of any entity or optical sensor.

The main ingredient in the IOS station is VR-Engage, which allows the instructor to easily take control of any entity in the scenario and manually control its behavior. When the instructor finishes role-playing an entity (for example, a helicopter, plane, or even a human entity on the deck of the ship), they can return it to AI control. They can switch to another unit immediately or resume operating VR-Forces.



A system this cohesive requires an integrator's incorporation of the 'glue' – the pieces that hold it all together and wring maximum value out of it. In this case, the system integrator connects all the pieces and gets them to talk to each other with **VR-Link** – every station we've

mentioned here has it, and it connects all the systems to the LVC simulation network. Here, the integrator can use HLA or DIS, since MAK products connect and interoperate regardless of protocol. The final ingredient is the **MAK Data Logger**, which records all simulation activity, audio exchanges, and even video feeds of the trainees to support after-action review, where a huge chunk of the actual learning happens.



We hope that we've piqued your interest through this illustration – it is always fascinating to see the different ways system integrators can take advantage of our tools!

To see a video version of this system, [click here](#). Want to learn about trade-offs in fidelity? See [The Tech-Savvy Guide to Virtual Simulation](#). Interested to see a [demonstration](#)?

New supported platforms and a new data packaging!

We're always looking to support the latest and greatest platforms our customers are using. Right now, we're updating our [supported platforms roadmap](#) - check it out to see what systems we're working with now! If you don't see your platform listed, [reach out to us](#). We know our customers have to pick a platform and stick with it, and we are here to support them as they deliver and maintain their systems.

We are also switching to a single Data Package setup to simplify the download process for customers. Look for a new set of instructions on our MAK Announcements. Don't already get MAK Announcements? [Sign up here](#)!

MAK Brings It All To ITEC!

ITEC is right around the corner, and we are excited to share the latest versions of MAK products with you. Our mainstay products have added new features and capabilities over the past year that give new power and flexibility to modeling and simulation professionals. Simultaneously, we've launched a new product, [VR-Engage](#), that gives system integrators an out-of-the-box multi-role virtual simulator to customize for all their first-person training needs. Come see our station in the Antycip Simulation stand 17c to say hello and get your hands on the new technology!

ITEC will be the first show to get the full, release version of VR-Engage 1.0! VR-Engage immerses users into a simulation as a first-person human character, a vehicle crew member, or the pilot of an airplane or helicopter.

VR-Engage can be deployed as a trainee simulator, as a role player station, or an instructor aid.

With it, you can train by yourself or within a simulation connected with other entities. You can add as many VR-Engage players to a simulation as you like. You could even use VR-Engage as

a proxy for a more expensive or difficult to use simulators.

If you are a **VR-Forces** 4.5 user, you get additional benefits from VR-Engage. You get to use your existing terrain, models, and configurations in both VR-Forces and VR-Engage. You get to use VR-Forces to set up the initial conditions of the manned players within your scenarios. You get to pass control between VR-Forces and VR-Engage, taking manual control of any VR-Forces entity in real time. You get to send task commands or trigger VR-Forces scenario events directly from VR-Engage. At ITEC, we'll walk you through these easy transitions and help you strategize how you can incorporate VR-Engage into your next simulation system!

Speaking of VR-Forces, we will be displaying synthetic environments full of urban, battlefield, maritime, and airspace entities. We've made strides with our behavioral models and actions to create a higher-fidelity simulation experience. Users can generate threats for training and mission rehearsal systems, experiment in a synthetic environment, or stimulate C4I systems.

In order to gain superior visual understanding of the simulation environment within those VR-Forces simulations, we will be turning to the latest version of **VR-Vantage**. VR-Vantage Stealth is used to provide compelling third-person perspectives, enhanced with 2D informational displays to provide contextual understanding and awareness. We will take advantage of VR-Vantage IG and its immersive, beautiful first-person out-the-window visuals. Ask about the customizability of VR-Vantage, and how to get the performance you want.

As great as our VR-Forces simulation environment is, we've made it easier to extend its reach with the **MAK WebLVC Server**.

WebLVC's browser-based apps provide powerful functionality, yet work with lightweight computers and mobile devices while avoiding the hassles of having to install software. Stop by the booth and we'll show you how we've added support for more of the VR-Forces remote control API, and how you can use a tablet to insert entities, set triggers, and change environmental settings!



A connected simulation can't function well if interoperability hasn't been considered, and interoperability has been the focus at MAK for over 25 years. The **VR-Link** toolkit provides an easy way to network your simulators and other federates – in fact, it's easier than ever now that VR-Link supports C# and Java! VR-Link provides an API that abstracts away the details of networking protocols. When you write your code to the VR-Link API, your applications become natively compliant with DIS, DIS 7, HLA 1.3, HLA, and HLA Evolved. Come by the booth and say hello to Felix, who will show you the best ways to connect your simulation!

If you're going to be at the show in Rotterdam, make sure you come by and meet the MAK team! If you're not able to make it, get in touch and we'll bring a demo directly to you.

NewsMAKers

Keep an eye out for the official release of VR-Engage! We expect to send a release announcement sometime next week. Not already getting our announcement? [You can sign up here](#) to get the latest release news from MAK!

We released our fourth podcast - a roundtable discussion about human simulation strategies featuring Jim Kogler, Dan Brockway, and Alex Broadbent! You can listen to this episode and others on [iTunes](#) and [Stitcher](#) or watch on [MAKtv](#)- subscribe on either audio service to always hear the latest conversations MAK is having!

We've updated our schedule with events that we will be attending in 2017. Be sure to [check out our events page](#) to see what shows we're attending, and where to find us!