

May
2019

What's Up MAK

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Hub

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official RTI of the
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for the EU's
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VT MAK in Europe

MAK is a core provider of simulation technology to countries and organizations across Europe. We have a strong long-standing partner in Antycip Simulation who help customers experience the MAK Suite of simulation products locally with sales, technical support, and integration services.

Antycip has created two demonstration and integration facilities where European customers can come and see the MAK Suite in action and test their systems integrated with the MAK Suite and Antycip's display systems. "The Hub" is Antycip's facility in Oxfordshire, UK, and "The Lab" is the facility in Saronno, Italy.

In this episode of MAKtv, Dan Brockway provides a demo of the MAK Suite running at The Hub. This demonstration includes ground operations and an air-to-ground engagement using a unified virtual environment and perfect correlation across the entire system.



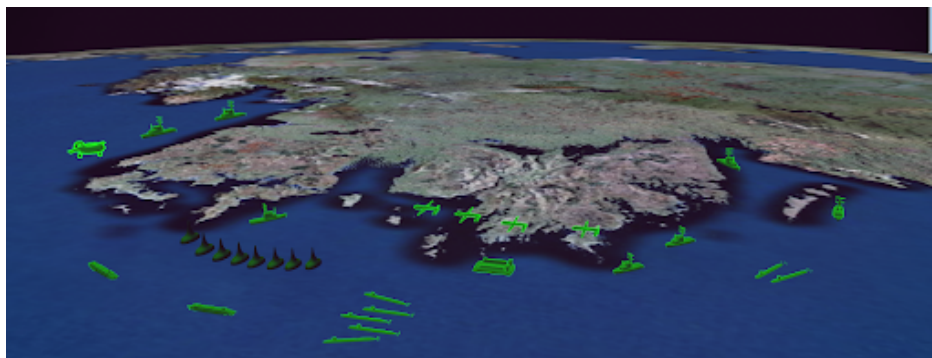
The MAK Suite will be on display at the ITEC conference in Stockholm, Sweden, May 14-16. For those not planning to attend ITEC, the MAK Suite is hosted in the cloud so that it's available for demonstrations anywhere in the world. Contact us or Antycip Simulation to schedule a walkthrough.

MAK RTI is the official RTI of the HLA Federation for the EU's OCEAN2020 project, but wait there's more...

VT MAK's agreement with the **OCEAN2020** project to provide the MAK RTI and VR-Link allows all participants from 42 partner organizations within 15 European countries to have an easy path to connect their simulations within the OCEAN2020 federation.

The OCEAN2020 initiative, signed in late March 2018, is a large-scale technology demonstration project funded by the European Union's Preparatory Action on Defence Research and implemented by the European Defence Agency.

OCEAN2020 has the mission to boost technological research in the naval domain by the integration of unmanned platforms in surveillance and interdiction missions. This is a large development project that involves sea demonstrations conducted by the participating organizations in cooperation with different European Navies. To prepare for the live trials, simulation activities will be carried out to prototype and test the individual unmanned systems and surveillance technologies within a virtual environment. MAK's VR-Forces is being used to populate this virtual environment with civilian shipping activity mixed with potentially threatening aggressors. MAK and Antycip Simulation are helping simulation participants stay focused on their part of the mission, without having to worry about simulation interoperability.



Although the mission is different, the simulation part of the OCEAN2020 project

has aspects in common with the simulation exercises called Operation Blended Warrior (OBW) that were sponsored by the National Training & Simulation Association (NTSA) in the United States in 2015, 2016, and 2017. OCEAN2020, OBW, and many large-scale simulations before them required many independent simulation providers to come together into a common simulation network. When this happens, problems arise. Problems that MAK products are designed to solve.

Let's have a look at some of the many ways that participants can take advantage of the MAK Suite of simulation and networking software to mitigate integration risks and ensure that the bulk of the time spent is focused on the objectives of the mission, not integration.

Connect to the Simulation Federation

Those with simulations that already use HLA can use the MAK RTI to connect. Those without HLA capability can use MAK's VR-Link toolkit to build an HLA capability into their applications.

Make a Virtual Prototype

As you develop your technology, consider using VR-Forces to simulate the environment. For those who don't already have a simulation framework, VR-Forces is a strong platform that allows you to integrate your own dynamics or sensor models or to plan out your tactical concepts of operation. You don't need to start from scratch, VR-Forces is well suited to this task.

Simulation Prophylactics

There is always a risk when adding a simulation to a federation that includes new partners. Your simulation might receive network messages that it is not prepared to handle. Sure, all players should be completely compliant with the Federation Object Model (FOM) and should send only valid messages. However, it is often the case that some system sends out “bad” or non-compliant data. When this happens, you have a couple of choices. You can spend time (usually time you don’t have) making your simulation more robust in the face of poorly formed network traffic. Or, you could use MAK’s VR-Exchange universal protocol translator to insulate your simulation from network traffic that is not relevant to your simulation so you can get back to the important work.

Have a Look In The Mirror

You don’t want to bring the simulator that causes trouble for others. MAK’s VR-Vantage battlefield visualization tool has prevented many integration disasters by allowing simulation developers to see their entities as they will be seen by others. If your unmanned submarine is traveling upside down, with the Stealth viewer, you can detect it yourself before you show yourself to the other participants.

Share Your Early Results

It is generally a good idea for participants to build up integration proficiency by testing their systems in a peer-to-peer fashion prior to joining a network with many unknown participants. One way to do this is to use the MAK Data Logger to record your simulation activity and share it with another participant. Your counterpart can send you their simulation activity and you can replay in the context of your simulation. If nothing else, you’ll learn how their system appears on the network with yours. MAK Data Logger also allows you to record your simulation activity for further analysis in development and after simulation trials.

Don’t Be Left Out

If you have a simulation that ‘speaks’ a protocol other than the particular flavour of HLA used by your project’s federation, have no fear. VR-Exchange can be made to translate your simulation’s native protocol to HLA. If your simulator uses a different HLA FOM or a version of DIS, we probably have a broker that will work for you. If your simulation is more exotic, we can help you develop a custom broker to allow your simulation to contribute to your federation.

We Have a World For You

If your part of the simulation happens in the open ocean, you’re in luck, VR-Forces comes with a dynamic ocean model that can be the extent of your world. But if you need to operate near the shores, consider using VR-TheWorld server to serve geographic terrain data to all of your simulation components.

Who’s In Control?

If your contribution to any project for that matter involves taking first-person control to operate a simulated platform or sensor, try VR-Engage. VR-Engage is a multi-role virtual simulator that can take over control of entities simulated by VR-Forces. You can fly a surveillance aircraft or become the sensor operator. All the while using the built-in radio capability to report your observations.

MAK and Antycip are here for you

MAK and Antycip Simulation have been helping customers develop and use these types of simulation systems for 28 years. Reach out and let us help you discover a winning simulation implementation plan.

Tech Tip: Transition Time

Fred Wersan, our technical writer for the past two-plus decades, is retiring next month and passing the baton on to Katherine Witbeck. We are tremendously thankful for Fred's years of dedication and service. It has been a pleasure to have him as a member of the MAK team, and we wish him a happy retirement.

After 21 years as MAK's tech writer and the primary contributor of Tech Tips, I will soon be retiring and want to introduce Katherine Witbeck, our new tech writer, who will be taking over this column. Katherine has more than 20 years of experience as a tech writer. She joined MAK in January and has already made important contributions to the documentation for this year's releases of VR-Engage, VR-Forces, and VR-Vantage. Her curiosity and attention to detail will be evident in the schedule of tech tips we have mapped out for the coming months.

Over the past few years, we have used Tech Tips to call your attention to interesting new features in our products and capabilities that might not be obvious at first glance. We've looked for subjects that require more technical skills than just clicking a few buttons in a dialog box, but which were accessible to our general user base. We've also written about features that weren't hard to use but required some context to fully appreciate. We plan to continue that approach moving forward. -Fred



I would like to thank Fred for everything he has done over the years, and especially for all the time he has spent helping me get up to speed on the MAK products and documentation. His knowledge and experience have been invaluable during this transition.

I'm looking forward to getting to know you, our customers, so here's a little about me to get this relationship started: I went to the University of Massachusetts (BA in English) and Bentley University (MS in Human Factors of Information Design).

I've been a technical writer since I graduated from UMass and very much enjoy it. My first job was with a sub-contractor for the FAA, training their employees on software. Some other interesting work was for iRobot, where I helped with their PackBot documentation and some usability testing.

I'm excited to take up the Tech Tip column and continue keeping you informed about all the great features that MAK products have to offer. -Katherine

Interoperability between DIS & HLA

By Aaron Dubois, Vice-Chair of the SISO RPR FOM Product Development Group



Many people know the RPR FOM as the object model that takes the contents of the DIS PDUs and organizes them into HLA object and interaction classes. The primary goal of RPR 1 and RPR 2 was, according to the standard, to “Support transition of legacy DIS systems to the HLA.” The idea was to make the transition easy by presenting the same data in a new format. RPR 1 was designed to support this goal for DIS 5, while RPR 2 added the capabilities of DIS 6. The RPR FOM group is still playing catch-up with DIS, with RPR 3 aimed at DIS 7.

However this time our goal has changed. The RPR group no longer considers DIS to be a legacy standard. Both standards have strong user bases, and the RPR FOM simply wants HLA users to have access to the full object model available in modern DIS simulations. So for RPR 3, especially as mixed architecture exercises become ever more common, we have changed that goal: we are now aiming to “Support the interoperability of DIS and HLA systems through the use of a gateway.”

This new goal provides a more clear purpose to our decisions, but there are always cases where the correct choice is not obvious. Take, for instance, the DIS variable parameter records and Attribute PDU. These concepts were added to DIS 7 in order to make the standard more extensible, allowing users to easily add their own optional extensions to the core DIS PDUs. However one of the strengths of HLA has always been the extensibility of its object model. This is a case of DIS adding something that the HLA standard already had. So does RPR 3 even need to address this capability?

When you consider the new goal of supporting interoperability through a gateway, the answer clearly becomes “yes.” What is a DIS-RPR gateway supposed to do with all of these new extended DIS records, especially when the contents may not be defined in the core standard? Since RPR is a reference FOM, which is designed to be extended via federation agreements to meet user needs, the ideal solution would be for each federation to extend the RPR FOM itself with new FOM attributes that can map to any extended DIS records. This is, in fact, the course of action that RPR 3 will recommend as best practice, but it requires work to support every new DIS record added. Not only do RPR federates need to be updated, so does your FOM and your gateway. This may not always be practical or even possible.

As a result, RPR 3 will likely add new base classes from which all other object and interaction classes will be derived. These base classes will add a new FOM attribute that will be defined as an array of variant records. Any DIS extension records that cannot be directly mapped by the gateway to known FOM attributes can instead be encoded into this array for consumption by any federates that can parse this new data. While we recognize this does not conform to the typical “HLA-style” of FOM design, it is a practical consideration that helps the standard best achieve its new goal of interoperability between standards.

What's new on MAKtv



We attended the AUVSI Xponential show in Chicago recently, where customers could experience the newest capability of VR-Engage — a drone operator training system! This simulator models both the flight of the drone, the operation of the sensor and the movement of the human character so that he/she can maintain a visual line of sight to the drone. The simulator reports when the operator leaves defined operational areas, enters restricted areas, or loses line-of-sight. It also reports the time spent in violation. Check out the latest video on MAKtv of Danny demonstrating the drone operator at the show!

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MAK Suite finished its spring season of product releases:

VR-Forces 4.7 is a major feature release that adds many new ISR-related features while continuing to make significant improvements to our visuals, performance, and content. New models have been added, including more realistic animations for humans entering and exiting vehicles. VR-Forces now simulates orbital motion with an Earth Centered Inertial model for space objects. Satellites and other objects can be quickly created by loading TLE (Two Line Element) files. Updates have been made to aggregate-level simulation and weather simulation, all while performance and ease-of-use have been improved.

VR-Vantage 2.5 is a major feature release that introduces some significant gains. MAK has continued to focus heavily on performance – to maintain smooth scenes at high frame rates even as demands for greater scene complexity and richness increase. MAK has also improved the overall visual experience of VR-Vantage making it easier to generate beautiful scenes, easier to configure, and easier to extend through our API.

We also updated **SensorFX**. SensorFX is a plug-in module for VR-Vantage that emulates the physics-based visuals, providing the same effects, enhancements, and optimizations as the actual sensor.

VR-Link 5.4.1 is a maintenance release that adds several major improvements. To reduce jitter for customers using asynchronous network reads in DIS, incoming PDUs are timestamped on network read. Positions are then Dead Reckoned backwards when decoded to account for time spent in the asynchronous network read queue. This change will reduce jitter on stable networks for fast moving entities operating in Relative Timestamp mode.

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 May, we'll be at **ITEC** in Stockholm, Sweden, with Antycip Simulation at our booth (IB60). We will be demonstrating The MAK Suite in its entirety, including the latest from VR-Forces 4.7 and VR-Vantage 2.5! Come meet Dan Brockway, Pete Swan, Nate Kidd, and the crew from Antycip.

Ivan Diaz will be representing MAK at **SITDEF** 2019 in Lima, Peru. Please reach out to him to schedule a meeting or a demo of MAK's latest software.

Jobs @ MAK:

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