

October
2019

What's Up MAK

MAK is growing to
meet project needs

Tech Tip:
Customizing
Simulation Models

See how DIS 8
standards will help
with terrain

MAK in Australia!

NewsMAKers



Seeing is believing

Physically realistic models, textures, and effects are vital components of immersive virtual environments.

The MAK art team is obsessed with developing the best graphics possible, particularly when it comes to our modeling. Over the past year, we've made some significant advancements that we're excited to tell you about.

This year, our art team is providing our customers with a whole slew of higher fidelity models, including ships with material classification. We've introduced variance to make it easier for customers to quickly insert a variety of accurate markings on military vehicles. We've increased detail for airports to create more beautiful synthetic environments, and our human characters have more models, states, and international soldiers than ever before.



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New models:

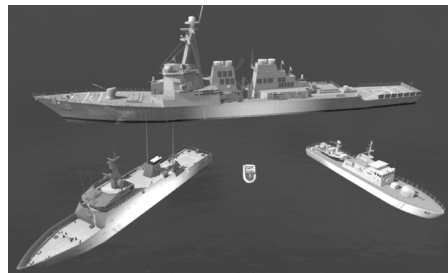
We've added a ton of new models to the VR-Forces library, including fixed- and rotary-wing aircraft, as well as tracked vehicles!

While our library is far too big to show you all of our models in a newsletter, you can check out a small sampling here.



Materially-Classified Models

We've added many new materially-classified models into the MAK One Suite, and materially-classified many that were already a part of our library. These updates provide more realistic representations through infra-red and night-vision sensor views, which is an integral part of the simulation experience for our customers involved in ISR and surveillance missions.

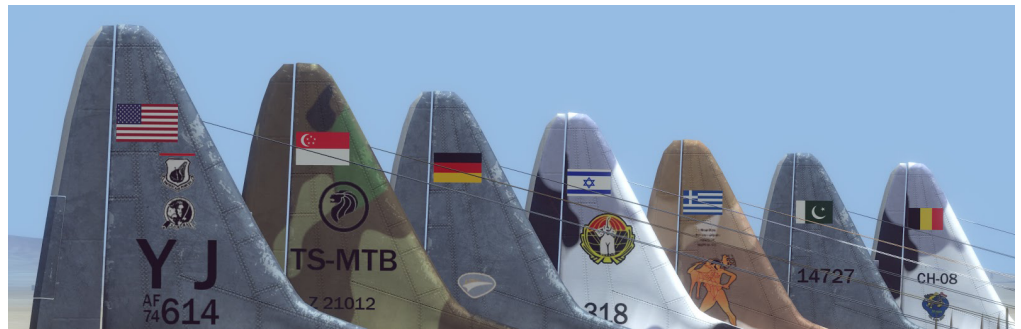


Variance

Great art that is properly organized provides the correct markings for models, and makes sorting through accurate versions of these models easy. A recent addition to VR-Forces is variance, which automatically renders your models with the correct livery for the country. Users can now place entities that are more visually accurate for the various scenarios they are making, including country markings, camouflage types, and other visual markings. A single entity configuration in VR-Forces can support many different paint schemes and visual markings.

VR-Forces automatically places entities with the correct marking based on the assigned force.

We continue to build up the battlespace with coalition forces by creating new models and associated variations.

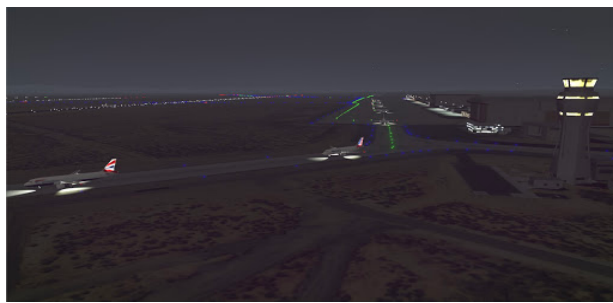


Terrain improvements:

The art team has built four new airports, Edwards Airforce Base, Palmdale Airport, Mojave Airport, and General Williams Fox Airfield. Edwards consists of four runways, one tower, and multiple Hangars. In total there were 2,213 buildings and 2,505 trees added.

All Airports include correct runway markings, runway Lighting, taxiway lights and signs, PAPI lights, approach lighting, windsocks, and corrected runway elevation.

We've added geospecific landmarks, including Cal City Water Tower and Prison, The Lakebed Tower (Flyby Tower), Palmdale TACAN & East Lakeshore TACAN, X-33 Launch Site, Blackbird Airpark, Joe Davies Heritage Airpark, Apollo Park (Foxfield), Milestones of Flight Air Museum (Foxfield), and Roton Tower (Foxfield).



Humans:

We have added injured states to our human characters, such as standing humans with head injuries. We've also added a new high-fidelity paratrooper model with a backpack and deployable chute. New soldiers with corresponding uniforms and correct weaponry have been added for Canada, Germany, India, Israel, South Korea, North Korea, Pakistan, Qatar, Saudi Arabia, Singapore, and Turkey. For more realistic ISR simulation, we've developed realistic animations for entities entering and exiting vehicles to make them smoother and more representative of the real world.

Related Content: The Air Force Test Pilot School at Edwards Air Force Base Upgrades to VR-Vantage IG



VR-Vantage IG helps Calspan double the value of flight tests to both train test pilots and collect data for industry partners.

MAK supports the Air Force Test Pilot School with VR-Vantage IG. VR-Vantage IG has been used in the Flight Sciences Simulator to train the next generation of test pilots in everything from aerodynamics to flight control design. Students have a one-year curriculum, and they run courses starting every six months. Learn more [here](#).

MAK is growing to meet the needs of its projects!

To meet the needs of the the U.S. Army Synthetic Training Environment (STE) and UK RAF Defense Operational Training Capability Core Systems & Services (DCS&S) programs, MAK has grown our ranks by 50% in the past three months, while opening a new office in Orlando.

We've brought onboard project management teams to address the STE and DCS&S programs, and IT professionals to address the cyber and information security concerns that go with working in trusted environments. The largest growth has been in our engineering department, in order to extend our software and integrate project-specific capabilities for our customers.

MAK was chosen to build the STE Common Synthetic Environment (CSE) because we are able to deliver a mature simulation system (MAK One) that meets many of the program's initial needs, including a core simulation engine (VR-Forces), trainee stations based on that same engine (VR-Engage), and scenario preparation and execution tools (VR-Forces).

The STE project is following an agile methodology to prioritize and close capability gaps between each delivery and the Initial Operating Capability of the STE system that will be deployed within the Army.

The STE project is just beginning, and we are already in the process of having soldiers and subject matter experts sitting at the stations of the Day One delivery and providing invaluable feedback on the initial capability. This feedback will inform the next set of capabilities to be delivered in the sprints to come.

Tech tip: Customizing simulation models

The Simulation Object Editor (SOE) is a tool that allows you to customize the models for your simulations.

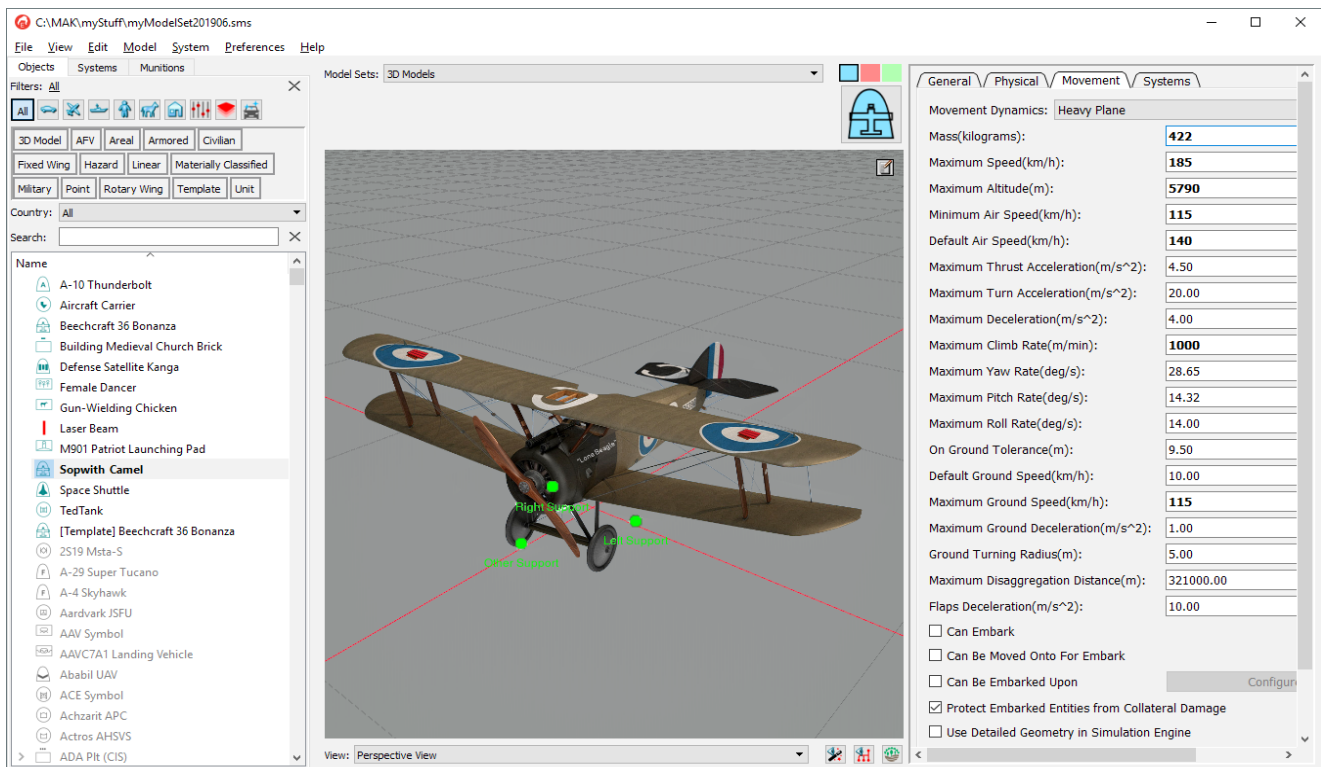
You can use an existing model from the Simulation Model Set (SMS) as the basis for a new model, and then customize it for your needs. In our example, we used the Beechcraft 36 Bonanza as the basis for a Sopwith Camel.

First, select the original model in the SOE and then choose Model > New From Existing. Enter a name for the new model, without spaces, and then click OK. The copy of the original model opens, allowing you to make your customizations.

To change the model, click Edit to open the Set 3D Models Visuals dialog. Click Add and then locate your model file. Once you open it, you are prompted to enter a name for the model definition. Click OK in the confirmation message. In the Set 3D Models Visuals dialog, make sure your 3D model is selected before clicking OK. Your new model displays in the editor.

Note: You should use an OpenFlight model. OpenFlight models allow you to configure nodes and switches, including Levels of Detail, Animations, Degree of Freedom. You also need to configure the nodes according to the WRM Specification (see that chapter in VR-Forces Users Guide).

After that, you can make additional modifications to customize the model to meet your needs. In our example, we edited the values in the Movement tab to match those of the Sopwith Camel. Next, we would edit the Systems tab to include only the sensors, weapons, and other systems available on that plane. Be sure to save the SMS.



For more about customizing models, please see Section XII, Creating and Editing Simulation Models, in the [VR-Forces Users Guide](#).

Interoperability update: Overcoming terrain challenges

Terrain is an essential part of simulation both visually and in the accuracy of data. For interoperability, this presents some challenges that simulators need to overcome. In DIS, coordinates are communicated in geocentric coordinates based on the WGS 84 reference frame. This can cause confusion when simulating with a terrain that includes geoids. For the upcoming DIS 8 standard, better guidelines are being worked on to aid simulations that need to convert between different terrains that may include geoids. This includes formulas used to convert between geodetic and geocentric coordinate systems.

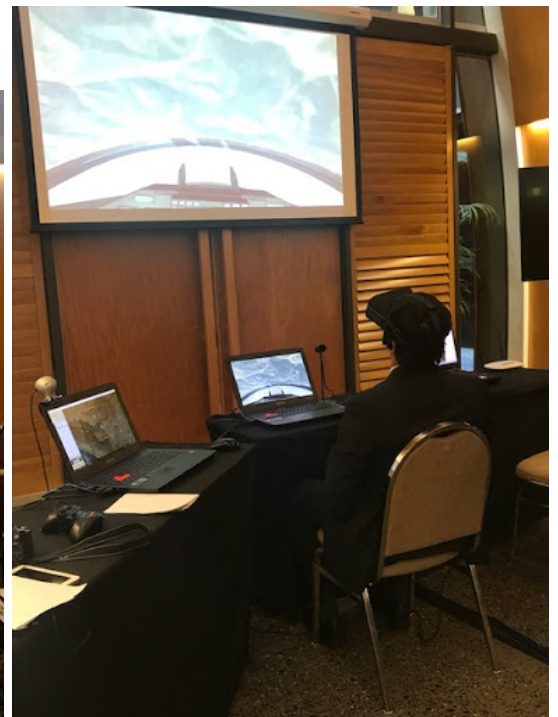
Here are the guidelines for DIS 8 as they are now:

Simulations that model a geoid and use geocentric coordinates:

- 1) When issuing a PDU, geoid height shall be removed so that altitude MSL is referenced to the WGS 84 ellipsoid rather than the geoid.
- 2) When receiving a PDU, geoid height shall be inserted for internal use of the geocentric coordinates.

MAK in Australia!

Dan Brockway, Steve Peart, and Ivan Diaz presented the MAK One platform in Canberra and Sydney recently. The events were a tremendous success for MAK's customers, who watched the MAK One system in person, got an inside look at how it works, and learned about the best ways it can be used for training. The U.S. Army is building its Synthetic Training Environment on the MAK One platform. **You can too!**



NewsMAKers

Upcoming events:

AUSA

Come see MAK One, the COTS simulation software platform that was chosen by the U.S. Army as the “best of breed” technology to meet the requirements of the Synthetic Training Environment’s core simulation software.

The MAK One system at AUSA will include multiple stations, including a QuantaDyn QFires training system.

MAK will be in the ST Engineering booth on the show floor. Bill Cole - Brigadier General (U.S. Army, Retired), Danny Williams, Ben Lubetsky, and Steve Peart will be in attendance.

Upcoming training:

VT MAK USER CONFERENCE

During this full-day event, you’ll find out about the latest developments in modeling and simulation of networked environments, using the VT MAK suite of products. This free-of-charge, one-day event will include new product information, case studies, hands-on demonstration sessions, and a visit to the Antycip UK demo center. Following last year’s successful event, the conference will take place with experts from VT MAK, allowing you to meet the team behind the software, and get valuable hints from the experts. Topics include user cases in training, experimentation, mission rehearsal, research, and development.

Recent Class Recordings:

Topic: [What’s new in VR-Forces 4.7](#)

This class is designed to introduce and explore the latest features of VR-Forces 4.7, the newest release. For information on the new features in VR-Forces 4.7, [click here](#).

Topic: [VR-Forces 104 - Simulating Humans Characters & Activity in VR-Forces](#)

The webinar will focus on how VR-Forces can be used to simulate individual human characters and their associated behaviors and actions. The webinar will also cover how these individuals can be aggregated into a group and associated group behaviors.

Topic: [VR-Vantage 102 - Introduction to Configuring Terrain Files for VR-Vantage & VR-Forces](#)

The webinar will focus on basic details of how to configure terrain files for VR-Vantage and VR-Forces. The webinar will provide introductory details of .mtf and .earth files and how they can be used to load, manage, and render Elevation, Imagery, and Feature data.

Jobs @ MAK:

We’re hiring! Check out our brand new [MAK careers page](#) and see the latest job postings.