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What's Up MÄK

JTAC Training: a critical part of the CAS mission

See how MÄK's simulators come together to build a JTAC trainer

MÄK to play a big role in Operation: Blended Warrior

MÄK is maximizing interoperability and simplifying early testing

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See how Melinda uses taekwondo to make a positive impact on her community



JTAC Training: A critical part of the Close Air Support mission

MÄK has built up simulation technology year after year, focusing on each piece of the networking infrastructure, through the core technology components — simulation, visualization, human characters, terrain, and web/mobile. (You can read [The MÄK Story](#) here.) Now, MÄK is surging ahead by applying these technologies to build simulators that meet more specific training needs. These simulators save system integrators time normally spent integrating core components, leaving them free to focus on meeting program specific requirements.

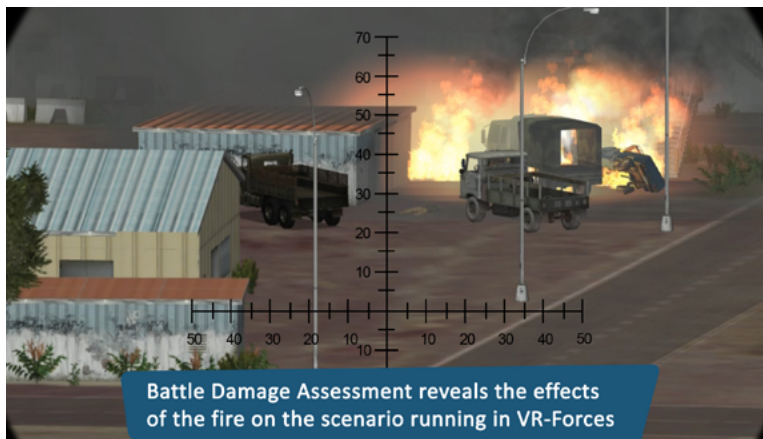
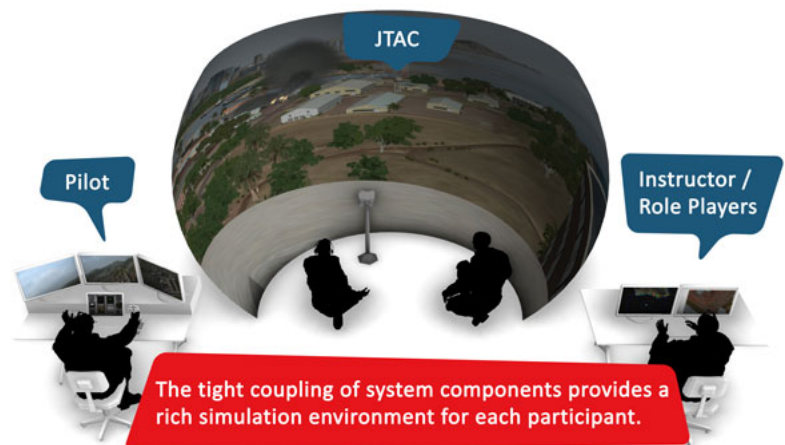
[JTAC trainers like the one pictured here](#), for example, are an ideal application for MÄK's simulators. Joint Terminal Attack Controllers (JTAC), as part of a Tactical Air Control Party (TACP), are relied on to direct and coordinate close air support missions, advise commanders on matters pertaining to air support, and observe and report the results of strikes. Their ability to communicate effectively with pilots, and coordinate accurate air strikes can play a huge role in the success of a mission.



Virtual training systems allow JTACs to practice identifying targets, calibrating their locations, requesting air support, and the highly-specialized procedures for communicating with pilots.

When JTAC training is done in a live format, it's expensive and limited. Aside from the equipment involved, the mere process of coordinating training can be very difficult. This is exacerbated when taking into account that certification is not a singular event. The certifications need to be continuously updated and refreshed with continuing education and training. Schools and students benefit from the increased availability of virtual training for JTACs.

In the use case shown, this JTAC trainer contains three stations — a JTAC trainee in a dome, a pilot at a desktop role player station, and an instructor at an instructor operating station managing the scenario and communications with the JTAC and Pilot.



The JTAC trains inside a 180-degree dome with multiple edge-matched channels of high-fidelity visual scenes rendered by **VR-Vantage IG**. This gives the trainee a realistic overview of the environment. The trainee uses binoculars and laser rangefinders, powered by VR-Vantage, to get an up-close view of the threats. These optical devices can be visual, infrared, or night vision, as appropriate for the training.

The pilot is playing the strike aircraft role, using a MÄK flight simulator built with **VR-Forces** and VR-Vantage, to execute the Close Air Support (CAS) mission. In this iteration, the simulator provides high-fidelity flight dynamics and supports Air-to-Ground and Air-to-Air Engagements. VR-Vantage's flexibility allows for multiple viewing configurations, including single screen and multi-screen out-the-window (OTW) views.



The flight controls can be on a separate monitor or integrated with the OTW scene.

The flight simulator is tightly integrated with the VR-Forces-based IOS so the instructor can initialize the flight missions, establish the weather environment, and inject faults to affect the mission outcome.

The instructor monitors the exercise and plays the role of anyone that the JTAC needs to coordinate with on the radio. The instructor is capable of manipulating the scenario in multiple ways — for example, an instructor can execute the mission directly by manipulating the scenario directly with the CGF, either by manipulating entities or just detonating a bomb in the prescribed location. Instructors can enter the 9-line briefing information (that they received over the radio from the JTAC) into a VR-Forces CAS Engagement Task and have the VR-Forces AI execute the mission. An instructor may pick up the controls and assume the role of an aircraft and fly the mission interactively.



Also, an instructor can ask a role player manning a flight simulator to fly the mission.

The JTAC simulator in this use case takes advantage of simulations built on MÄK's core technologies: VR-Forces, VR-Vantage, and **VR-Link**, the **MÄK Data Logger** and the **MÄK RTI**. The tight coupling of system components provides a rich simulation environment for each participant.

All these system components share a common terrain database and are connected together using VR-Link and the MÄK RTI, giving the system integrator the ability to deploy reliably and cost effectively while leaving open the opportunity to expand the system to add bigger and more complex networks of live, virtual and/or constructive simulations. The entire exercise is captured by the MÄK Data Logger for after action review (AAR) analysis and debriefing. Radios are provided that communicate over the DIS or HLA simulation infrastructure and are recorded by the MÄK Data Logger for AAR.

Choosing MÄK for simulation infrastructure gives system integrators state-of-the-art technology and the renowned 'engineer down the hall' technical support that they expect from MÄK. This has been the lifeblood of MÄK's culture from day one, and will continue to be MÄK's foundation into the future.

Want to learn more about **virtual simulation**? Interested in seeing a **demonstration**?

MÄK to play a big role in Operation: Blended Warrior

At I/ITSEC, VT MÄK will again be participating in Operation Blended Warrior (OBW). Operation Blended Warrior is a multi-year exploration of Live, Virtual, and Constructive (LVC) capabilities for the defense and security sectors, organized by the National Training and Simulation Association (NTSA). This year, a number of organizations from government and industry will unite to design a simulation exercise that runs on the show floor, sponsored by the USAF. It will demonstrate how individual capabilities can be linked together to minimize costs and maximize benefits of the LVC approach to training and education.



OBW 2015 yielded significant learning for participants. This year, OBW expands its focus to also measure trainee performance to determine the most efficient and effective training mechanisms, as well as demonstrating multi-level security solutions that allow for control over information sharing between participants. There are also plans for a separate/parallel international network and off-site connectivity.

It is a challenge to connect many different simulators and maintain a viable exercise network. A large number of players generating diverse traffic types on the network creates complexity. For 2016, the USAF desired that DIS 7 would be the primary simulation protocol, meaning that anyone using a different protocol would require a gateway to communicate. Because of a tight integration schedule and limited testing opportunities, gateways will be used not only as protocol translators, but as a way of isolating a simulation from network traffic that might be harmful or reduce performance. As was done for OBW '15, MÄK is making **VR-Exchange** software freely available to all companies who require a gateway for interoperability. With its combination of low cost, out-of-the-box usability, and reliability, it remains a very popular solution. Participating organizations learned the value of COTS tools during the lead up to the event at I/ITSEC last year, and we expect VR-Exchange to be used by even more companies this time. The **MÄK RTI** will also be available to all OBW participants using HLA on their side of the gateway.



MÄK is playing several roles throughout the simulation. MÄK will use [VR-Forces CGF](#) to simulate a Fire Scout UAV, tasked to extend the range and vision of a littoral combat ship (LCS) simulated by the Navy. MÄK will also be responsible for simulating all the commercial shipping traffic within the simulation.

MÄK is also making the [Data Logger](#) tool available to participants to test and debug in advance of I/ITSEC as an aid to integration. The Data Logger records and shares sim traffic, so everyone can play it back to analyze movement and ensure entity representation is accurate. One of the critical lessons of OBW 2015 was the value of sharing data logs between participants.

In addition to VR-Exchange and the MÄK Data Logger, MÄK's [WebLVC](#) product is available to all participants at OBW. WebLVC provides live 2-D and 3-D situational awareness views of OBW, and the fact that it's browser-based means there is no need to install software.

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VT MÄK will be exhibiting at [Fall SIW 2016](#) in Orlando, FL from September 11th-16th! Stop by our booth and meet Pete Swan, who will be conducting demos of the latest MÄK software. Come see our newest use cases in action!

Simulation Solution Australia (SimSol) will be exhibiting the latest suite of MÄK software at [SimTecT](#)! SimTecT will be held this year at the Melbourne Convention Center from Monday September 26th-29th. Please stop by and visit SimSol where they can demonstrate the latest updates in VR-Forces, VR-Vantage and our complete suite of Interoperability software such as VR-Link, MÄK RTI and WebLVC.

Be sure to keep current with our upcoming events. Check out our [events page](#) to see what shows we're attending, where to find us, and what we're showing!

MÄKer Spotlight: Melinda Minear, Taekwondo Superhero

This month, we return to our theme of MÄKers who are making a difference in their community with Melinda Minear, Senior Software Engineer at MÄK!

Melinda joined C.W. Taekwondo in Cambridge in its infancy, and has helped it grow into a force for the community. C.W. was founded by some of her friends from Cornell when they had noticed that martial arts studios were becoming more for-profit, insular, and expensive. They weren't accepting of people from outside their studios and didn't reach out to the community they were in. With a service-oriented mindset, C.W. was set up as a non-profit response to this trend.



Melinda taught at multiple levels for 11 years and has been on the board since 2000. Starting with relatively little, she has helped C.W. move into its own space, add childrens' classes, and provide tuition assistance for those in need. C.W. also provides assistance to aspiring Taekwondo athletes who compete at the national and international level including the Olympics!

Taekwondo builds physical and mental strength, while also recognizing individuals and the community. It teaches respect for

people of all walks of life regardless of race, religion, or sexual orientation, and C.W. is proud of the diversity in its students. C.W. is also exceptional in the fact that they feature strong female participation at all levels including the instructor level. Free classes are provided to charity. C.W. participated in the Charles River Annual Clean Up, Cambridge River Festival, and Harvard MayFair.

We hope we've piqued your interest in getting to know the MÄK team! Stay tuned to our [blog](#) and [Twitter](#) to get the latest on MÄK happenings!