

## Next-Generation Simulation that Revolutionizes Training – Mixed Reality Simulators

Dan Brockway, VP Marketing May 15, 2019

## MAK's Solutions Help Customers Demonstrate, Experiment, and Train

#### **Rapid Scenario Generation**

- Proposals
- Demonstration
- Concept Development
- Experimentation



#### System Development & Analytics

- Systems Prototyping
- Systems Test
- TTP Development & Analysis



- Trainers
- Simulators
- Wargaming



#### Over Two Decades Helping Customers Build and Populate 3D Simulated Environments



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# Our technology fits in many system designs







## JTAC Trainer





# Shipboard Weapons Systems





# Mechanized Infantry Trainers





# **Classroom Training**











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## Air Mission Operations Center







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## Live training is extremely expensive





## Immersive Simulators are very expensive also





### Mixed Reality Simulators bring the cost way down



### Mixed Reality Simulator – Green Screen Approach



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### Mixed Reality Simulator – Virtual Cockpit Approach



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#### Mixed Reality Simulator – No Green Screen



Without a green screen, precise registration between the physical gear and the virtual model mask is required. Inside the mask the camera video is used, outside the mask the use virtual video is used.



#### Mixed Reality Simulator – Partial Green Screen



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## **Example of Limited Green Screen**









#### Mixed Reality Simulator – No Green Screen



Depth computed from head-mounted Stereo cameras can be used to determine which part of the camera video to use. Everywhere else, virtual video is used.







## Augmented Reality Simulator – Future solution



dark simulator environment, and high-res

see-through, wide-angle displays.



The virtual cockpit is used to mask the virtual scene so that only areas that appear on the black cockpit windows are projected onto the pilot's see-through display.





## Mixed Reality is today's sweet spot for delivering low-cost immersive training

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