

# A CASE STUDY: U.S. MARINE CORPS COMBAT DEVELOPMENT COMMAND DEVELOPING EFFICIENT UNMANNED AIRCRAFT SYSTEMS ANALYSIS TOOLS

## Challenge:

The U.S. Marine Corps Combat Development Command was tasked with finding the most cost-effective mix of unmanned aircraft system (UAS) capabilities to meet operational Marine Air-Ground Task Force requirements.

## Solution:

As MCCDC's primary qualitative tool, AGI products assessed UAS and candidate sensors and their ability to communicate with ground control stations and ground-based assets in realistic terrain; performed detailed comparative analyses on EO/IR sensors; and tested operational effectiveness of ISR UASs.

## Results:

AGI products are serving as the primary software used to develop and analyze this new UAS concept. Further, the AGI-based ISR mission analysis tool is now in use to support combat operations in Afghanistan.



*The U.S. Marine Corps Combat Development Command is using AGI products as the qualitative tool for its Tier II/ Small Tactical Unmanned Aircraft Systems (STUAS) Analysis of Alternatives.*

Assessing communications performance in isolation can adversely influence system architecture design and overall mission satisfaction. For example, when designing the communications link for an unmanned aircraft system (UAS) that will return live video to field commanders, it would be a mistake to do so without an understanding of how the aircraft, optical sensor and communications combine to deliver surveillance coverage.

AGI software avoids such suboptimal mission architectures and engineering inefficiencies by modeling the aircraft, optical sensor and communications link as a system and directly measuring resulting mission-level performance. This facilitates rapid trade studies that could indicate a lower operating altitude and a small increase in power budget for the communications link can increase surveillance coverage.

The U.S. Marine Corps Combat Development Command (MCCDC) realized such benefits when it employed AGI products for its Tier II/ Small Tactical Unmanned Aircraft Systems (STUAS) Analysis of Alternatives. This AoA involved finding the most cost-effective mix of UAS capabilities to meet operational Marine Air-Ground Task Force requirements.

As MCCDC's primary qualitative tool, AGI products assessed UAS and candidate sensors and their ability to communicate with ground control stations and ground-based assets in realistic terrain; performed detailed comparative analyses on EO/IR sensors; and tested operational effectiveness of ISR UASs. "It would have been futile for me to produce analyses that only included the sensors in an operational context without factoring in the communications sub-systems. There is a huge correlation between the two, and STK gives us this specific capability," says Lt Col Brian Zacherl, MCCDC.

Using AGI technology MCCDC tested environmental impacts on situational awareness and line-of-sight communications. AGI software provided integrated sensor and platform analysis and modeling capabilities incorporating high-fidelity terrain; sensor coverage; communications and line-of-sight analysis; and high-level sensor modeling. "AGI software shows us the tradeoffs and that is why we keep working with it," Zacherl says.

Tier II/STUAS was approved by the Joint Staff in September 2008, with AGI products as the primary software used to develop and analyze this new concept. In addition to guiding this acquisition, the AGI-based ISR mission analysis tool is now in use to support combat operations in Afghanistan.

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