

SUCCESS STORY

TOPIC NUMBER:
N04-174

SBIR INVESTMENT:
\$1,738,524.81

PHASE III FUNDING:
\$21,236,089



EF-18 ELECTRONIC COMBAT AUTOMATION

Through SBIR, GBL Systems developed its Electronic Combat Decision Support System, resulting in better decision aids and electronic combat automation in the Navy's fleet of electronic warfare aircraft.

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THE CHALLENGE

The ForceNet mandate that warriors, sensors, command and control, platforms, and weapons be integrated into a networked, distributed combat force drives the need to develop a cross-platform integration of Electronic Warfare (EW) assets. Through SBIR, the Navy sought the development of a combat decision support system to aid flight crews and EW experts in decision making processes. The system needs to link proven artificial intelligence (AI) technology reasoning agents into a unified system to utilize expert knowledge in specific domains to augment crew efficiency and involvement in the ForceNet, to allow a single operator to manage and generate jamming assignments, and to exploit the ability to share response coverage between on and off-board assets.

THE TECHNOLOGY

GBL Systems answered this need and developed its Electronic Combat Decision Support System (ECDSS), an automated system developed for the Boeing EA-18G Growler EW aircraft, that utilizes advanced AI, distributed intelligent agent technologies, and EW visualization/decision aids. The system design includes EA-18G and JMPS Mission Planning Environment (MPE) interface integration. The ECDSS employs intelligent agent based-architecture layered on a CoABS grid framework that includes airborne MPE components, the inclusion of refined jamming management control algorithms, and candidate aircrew-interface decision aid advisories.

THE TRANSITION

GBL Systems has been awarded over \$21 million in Phase III contracts and extensions from the F-35 Reprogramming Center - West (RC-West) to leverage ECDSS to aid in the development of F-35 mission data file (MDF) tools and associated test capabilities. These contracts funded further development of the advanced decision aids and intelligent agent-based technologies to reduce risk and improve user

interactions with MDF development, test, and evaluation tools at the Joint Reprogramming Enterprise (JRE) facilities in support of Navy and various Foreign Military Sales (FMS) customers.

THE NAVAL BENEFIT

Through the SBIR process, GBL Systems has successfully evolved its product line: The SaigeTEC Toolkit, which consists of advanced AI Distributed Intelligent Agent (DIA) technologies and AI/machine learning (ML) algorithms, improves the autonomy of warfighter systems. The SaigeTEC Toolkit is a cognitive collaborative multi-platform AI technology that powers autonomous systems for manned/unmanned teaming.

THE FUTURE

The information produced by the ECDSS provides tremendous situational awareness for use at the tactical edge in the EW vehicle, and also by the command and control decision maker. Applications of the ECDSS automation technologies include not just the EA-18G, but other potential EW vehicles such as the JSF, E-2C, EP-3, B-52H, uncrewed aerial vehicles applications and future weapon system development efforts. The current market for the ECDSS system is large and forecasted to rapidly grow as the DoD recognizes new and legacy systems that can be upgraded. The ECDSS system also provides the ability to evaluate and develop new potential decision aids for any electronic attack aircraft. The ECDSS continues to be leveraged by the F-35 program, Intelligent Collaborative Engagement, Future Naval Capability, Brilliant Effects Employment Shadow, and Miniature Air Launched Decoy-X flight demonstration. Eventually, use of this technology by the Marine Corps would make land-based EW applications capable of collaborative network centric operations including interaction with airborne EW and electronic surveillance assets.