Department of the Navy SBIR/STTR Transition Program

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Topic # N141-019

Applying Advanced Human Engineering Methods to Mission Planning for Multi-Manned or Unmanned Air Vehicles

Monterey Technologies, Inc.

WHO

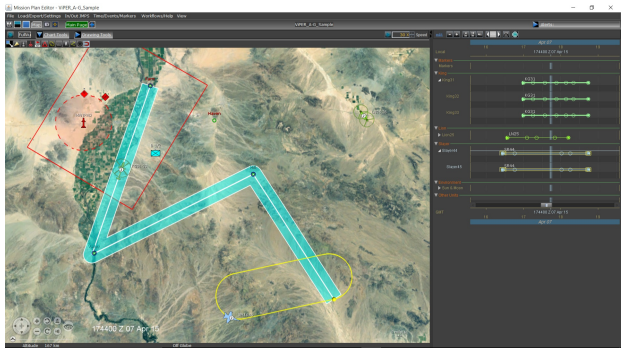
SYSCOM: NAVAIR

Sponsoring Program: Strike Planning and Execution Systems Program Office (PMA-281)

Transition Target: Visual Planning, Execution and Review-Carrier Air Wing (ViPER-CVW) System

TPOC:
(301)757-6179

Other transition opportunities:
Joint Mission Planning System (JMPS-AF) Program Office
JMPS-AF, Mission Planning Environment (MPE)
- F22A MPE
- RC-135 MPE
- A10 MPE



ViPER-CVW, Copyright, 2015, Monterey Technologies, Inc.

Missile Defense Agency (MDA)
- Ballistic Missile Defense System (BMDS), Mission Planning

Notes: Screenshot showing ground order of battle, airspace tools, and support assets.

WHAT

Operational Need and Improvement: Current mission planning processes are labor and time intensive, complicated, and require considerable training/proficiency. Nearly every aircraft requires a digital mission plan prior to execution of an airborne mission, potentially requiring re-authorization if they deviate from the existing validated plan. This can have serious impact on the ability to prosecute time critical targets due to excessive time-to-re-plan requirements. New innovative human factors workflows, visualizations, and improved data handling algorithms are needed to establish near real-time mission planning processes to support Joint Task Force integration of naval assets.

Specifications Required: The development focus is to create an innovative user interface to guide mission planners in a streamlined approach through highly complex and detailed mission planning procedures. Development must address human factors engineering to simplify data entry and uploading through intuitive human-computer interactions and visualization techniques. The proposed planning methods should be highly adaptive to accommodate mission planning for new and enhanced weapon systems and platforms.

Technology Developed: ViPER-CVW gives Carrier Air Wing planners a digital environment to create integrated multi-element strike plans, showing multi-aircraft packages in space, time, and in relation to planning constraints. ViPER's stand-alone java-based application iis a JMPS federated app, but can be deployed in a variety of operating environments. Changes to ViPER will improve legacy HCI designs to streamline workflows, data entry, and provide additional task aids to support missions such as USMC Air Assault. The end goal is a “modern”, streamlined, graphically pleasing interface that is simple and uncluttered.

Warfighter Value: ViPER, designed from a perspective which looks at planning components that underlie all naval planning echelons, employs the simplest available methods for sketching and visualizing planning components in a common temporal and spatial context. Digital planning data is used from the outset, providing time and tools for mission rehearsal, analysis, re-planning, and optimization. ViPER transitions JMPS from an aircraft data loading to a tactical planning capability.

WHEN

Contract Number: N68335-15-C-0156 **Ending on:** November 27, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Spiral 1 Software update with upgraded UI prototype	Low	New ViPER-CVW UI demonstrates more streamlined, intuitive workflows with fleet evaluators	8	December 2015
Spiral 2 Software update with upgraded UI and additional mission tools	Med	Software update passes engineering and operational testing	9	June 2016
Spiral 3 Operational software release with upgraded UI and mission tools	Med	ViPER-CVW effectively used by fleet operators	9	November 2016

HOW

Projected Business Model: Monterey Technologies will continue to act as the prime contractor for development and integration of ViPER-CVW software. Additional task analysis, requirements derivation, and feature design is required to fully exploit the benefits of ViPER in addition to software code maintenance and production. MTI will continue to work closely with JMPS component developers, subcontractors, and prime contractors to develop new capabilities and integrate Viper-CVW functionality into additional JMPS MPE tools.

Company Objectives: Although, ViPER-CVW is well-known in the naval carrier aviation community, its capabilities are easily tailored to support the broader aviation community, Carrier Strike Group, Joint Task Force, and tactical multi-asset planning mission planning activities. MTI is interested in transitioning VIPER-based mission planning technology to additional Navy, Air Force, and MDA mission planning activities. A version of ViPER, the submarine Mission Planning Application (MPA) is currently targeted for integration into the submarine combat system.

Potential Commercial Applications: Potential target markets for ViPER's multi-vehicle planning environment include many commercial planning activities, such as "delivery drone route planning", currently being explored by Amazon. Logistics and shipping companies can leverage MTI's ViPER-like mission planning functionality to support planning, re-planning and the synchronization of enroute and scheduled delivery planning requirements.

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