Commercial, Off-The-Shelf Development of Next Generation Unmanned Aerial System Capabilities: Development of the FEAR system

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Abstract: The Functional Engagement Area Recon (FEAR) research team developed a novel Unmanned Aerial System (UAS) proof of concept demonstration that will enable small, tactical units to utilize innovative intelligence, surveillance, and reconnaissance (ISR) capabilities to provide situational awareness in near-real time. Using a combination of existing, commercially available technologies and proprietary capstone technology in a systems design approach, team FEAR demonstrated a suite of requisite capabilities to allow the autonomous mapping, classifying, and target differentiation of an urban military objective in the year 2030. Unique contributions of this system were a 4-camera (360-degree) video capability, interim and objective airframe selection, and a remote, automatic battery exchange capability that extends system surveillance time. Detailed system power consumption and energy storage trend analyses define a development glide path for meeting all specified design requirements for the year 2030.

Keywords: Autonomous system, ISR, classifying, mapping, target differentiating, UAS, defense system applications