Manned-Unmanned Directional Mesh Enhanced Tactical Airborne Networks

Fantastic Data

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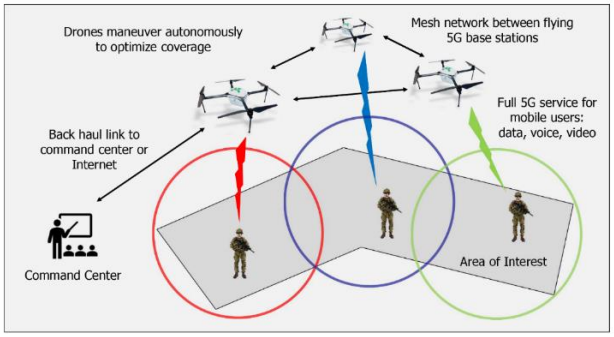

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Topic Number: N192-070
SYSCOM: Naval Air Systems Command (NAVAIR)
www.navair.navy.mil

Program Sponsor: PMA-263 Small Tactical Unmanned Aircraft Systems

Other Potential Programs: PMA-299 Rotary H-60 Multi-Mission Helicopters Program, PMA-268 Unmanned Carrier Aviation Program, F-35 Lightning II Joint Program, PE 0604011D8Z Next Generation Information Communications Technology (5G)

Current TRL: 5 (control system validated)
Projected TRL: 7 (prototype demonstrated in open-air flight) / Q4 2022

Keywords:
5G, Mobile Data, Cellular, Mesh Network, Drone, UAS, Autonomous

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THE CHALLENGE

The cellular network works so well that most of the time we don't even think about it. We are so used to ubiquitous service, that we use it almost unconsciously—to get real time driving directions, for real time coordination with colleagues, to look up information while on the move. Mobile phone service—voice, data, and video—is always there until you need to operate in an area without service infrastructure—for example, in a remote area, after a natural disaster, or on the battlefield. Without the cellular infrastructure of towers and base stations, all that wonderful network service abruptly disappears. Operations that rely on that service become difficult, time consuming, or impossible especially for littoral operations.

THE INNOVATION

5Gflyer supplies 5G cellular network service—anywhere, anytime— through a network of autonomous, flying 5G base stations that provides full 5G communication services. A full 5G base station is mounted on a person-portable, quadcopter drone. Depending upon the mobility and dispersion operational coverage needs, a 5G deployment may comprise one, several, or many drones linked together by an autonomous control system that performs all network and flight management functions. Connection to an external cell network for worldwide communication is optional.

THE NAVY BENEFIT

5Gflyer provides Manned-Unmanned Directional Mesh Enhanced Tactical Airborne Network capability to share imagery, full-motion video, data, and voice for Navy's Project Overmatch and to support Joint All-Domain Command and Control (JADC2) effort to remove proprietary network standards, thus enabling interoperability with the other services. Unpack and deploy the drones on the ground, pick your required coverage area, and 5Gflyer does the rest—calculating the number of drones required to ensure 5G coverage, determining flight paths, take off and transit to the area, return to base and landing on low power, and takeoff of a substitute drone. Mobile personnel receive services through cell phones— no additional control infrastructure; no additional equipment to buy, bring to the field, and deploy; no additional operator burden to manage the system.

THE FUTURE

A coordinated flight of three drones has been performed to test the autonomous control algorithm. Integration of the 5G base station with the drone hardware is underway in preparation for Rapid Prototype Experimental Demonstration (RPED) open-air tests in Fall 2022.