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Extended MAGTAF Operations Aerial Layer Communications Experimentation

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**NAVAL
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NAVAL RESEARCH PROGRAM

MONTEREY, CALIFORNIA

EXTENDED MAGTAF OPERATIONS AERIAL LAYER

COMMUNICATIONS EXPERIMENTATION

by

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GSOIS

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Prepared for: 1MEF USMC

Col (Ret) Stephen K Heywood USMC

FY15 MID-YEAR REPORT

Background

The objective of this project is to study current and emerging aerial layer communications, such as balloons or small form factor aerostats (tethered and untethered) and long-endurance UAVs, to provide high-capacity, high-availability communications support in satellite-denied terrain. Through field experiments of leveraging COTS technologies, the study will address the feasibility of purported aerial layer architectures. The current status and direction of the Joint Aerial Layer Network will be considered within the study. The results of the study will inform best options to equip expeditionary forces with reliable Over-the-Horizon, On-the-Move communications to the tactical end user.

Process

This effort is being accomplished through a series of field experiments to try out various OTH (Over the Horizon) communications. In each experiment, we set up a configuration that uses a specific set of equipment and devices. Once the configuration has been set, we collect data which is subsequently analyzed and documented. This analysis tells us about the suitability of the configuration for our objectives.

Findings and Conclusions

- A thesis proposal has been approved and signed by the CS Department Chair.
- Conducted the following field experiments:
 - o Camp Roberts – measured link throughput of target COTS radio over ground link to verify readiness for SkySat (high-altitude balloon) testing (March 15)
 - o MCAS Yuma – launch Wave Relay radio on SkySat balloon system and measured link performance as the balloon drifted down range. Identified areas of concern with respect to link budget (signal-to-noise ration and received signal strength)
- Chapter 2 of thesis completed and reviewed
- Chapter 3 in progress
- Developing follow-on field demonstration recommendations

Recommendations

Since this work is underway, there are no significant recommendations are to make. Data compilation and analysis need to be completed and documented before specific recommendations can be made.

Sponsor/advocate has requested follow-on study based on preliminary results of the Yuma field experiment.