

Network Optional Warfare (NOW)

Optical Signaling and Data Compression

Objectives

- Network Optional Warfare (NOW): Optical Signaling and Data Compression for Improved Stealth, with Design of Experiments for Evaluating Operational Concepts.
- Vulnerabilities arise for naval forces conducting constant communications due to lack of stealth and dependence on continuous data exchange. Asymmetric advantage needed.
- "Radio silence" emissions control (EMCON) and judicious use of low-probability of intercept (LPI) communications can restore naval covertness and tactical surprise.
- Data compression and a coherently defined signal book can enable fluid operations across NCW and NOW, aiding command autonomy and freedom of action.



Approach

- NOW includes three key technology enablers of interest:
- Optical Signaling: resume deferred Tactical Decision Aid (TDA) software development, also test QR Code Digital Semaphore and Digital Flashing Light (DFL),
- Efficient Messaging: continuing work on Open-EXI software development/testing, deploy via Apache Software Foundation
- Semantic Coherence: improve throughput, align well-defined protocols into unified Tactical Signal Book (separate proposals)
- Work includes extensive list of use cases of tactical relevance
- Extensive resources, references, blogs and other work online: <https://wiki.nps.edu/display/NOW/Network+Optional+Warfare>

Deliverables

- Continuing set of these addressing crucial Navy challenges, multiple exciting research exploration topics listed in proposal
- Update open-source codebases: QR codes, DFL, signal flags
- Apply EXI compression of XML in simulated & developmental test cases of interest, follow OPNAV study recommendations
- Emulate pair of flashing lights atop Spanagel, Ingersoll Hall with digital or mechanical shuttering as experimental testbed
- Add QR codes to MacMillan Field runways (e.g. King Hall) for UAV testing as regular part of flight, experiment operations
- Perform studies regarding use of NOW as core C2 technique for Littoral Operations under Anti-Access Area Denial (A2/AD) during Joint Command & Control Capstone class



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