

# MASTER OF SCIENCE IN AERONAUTICAL ENGINEERING

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**CRITICAL RESPONSE TIME ANALYSIS FOR EA -6B ELECTRONIC ATTACK USING  
ELECTRONIC WARFARE NETWORK CENTRIC SIMULATION (EWNCS) SOFTWARE (U)**

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As part of the Airborne Electronic Attack (AEA) Analysis of Alternatives (AoA), the Office of Naval Research (ONR) sponsored a project titled *Distributed and Networked C2W Technology*, designed to explore the operational impact of modern network technology on Department of Defense (DoD) electronic warfare (EW) efforts. With this, Electronic Warfare Network Centric Simulation (EWNCS) Software was created to help examine the reactive electronic attack (EA) capabilities of networked EW assets.

Written in C++, EWNCS analyzes the complex interaction of networked radar systems acted upon by numerous strike aircraft radar cross sections (RCS) and Suppression of Enemy Air Defenses (SEAD) assets. Calculations are performed at the radar pulse level and account for the impact of terrain, altitude, distance, alignment, SEAD capability, responsiveness, networking and tactics on the comprehensive EW picture. Additionally, EWNCS derives an optimum SEAD solution by employing genetic algorithm search procedures.

In conjunction with Naval Research Laboratory (NRL) efforts, this thesis offers an inclusive overview of reactive EA, a MATLAB computer model yielding minimum jamming response times for reactive EA targeting, a comprehensive examination of Link 16 and Improved Data Modem (IDM) application to networked EW efforts, and the ultimate implementation of the aforementioned concepts into representative EWNCS scenarios.

**KEYWORDS:** Analysis of Alternatives, Airborne Electronic Attack, EA -6B, Suppression of Enemy Air Defense, Link 16, Improved Data Modem

