MASTER OF SCIENCE
IN
APPLIED PHYSICS

DESIGN CONSIDERATIONS FOR DISTRIBUTED COMBAT SYSTEMS ON SMALL COMBATANTS USING COOPERATIVE ENGAGEMENT CAPABILITY

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This thesis describes a distributed system of more numerous, minimally manned, independently capable ships networking sensors, fire control, and command and control through data links to perform as a single collective entity to improve sensor coverage and enhance system performance in all warfare areas. Global forward presence in littoral waters is taxing our fleet while simultaneously under utilizing the assets aboard individual hulls. Our combatants are individually more capable than required by most scenarios and less numerous than required to accommodate all scenarios. Numerous technologies have matured, and are maturing, that can be harnessed to produce a surface combatant based warfare system of Cooperative Engagement Capable Distributed Combat Systems (CECDCS) that can provide the broad thin coverage required for routine littoral operations and mass together to form an integrated battle fleet and strike force providing complete spectrum coverage including: special operations, amphibious operations, theater ballistic missile defense and war at sea capabilities. System integration and distribution, at all levels, from single ship systems at the hull level to multi-platform sensor and weapons integration will significantly enhance battle space awareness and combat capability even while employing individual systems and sensors that are individually less capable than the absolute best systems available.

DoD KEY TECHNOLOGY AREA: Command, Control, and Communications

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