

MASTER OF SCIENCE IN SPACE SYSTEMS OPERATIONS

VSAT EXPLOITATION (U)

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Master of Science in Space Systems Operations-September 1999

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Abstract is classified.

DoD KEY TECHNOLOGY AREA: Other (Signals Intelligence)

KEYWORDS: VSAT Technology, Space-Based Sensors

(CLASSIFIED TITLE)

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Abstract is classified.

DoD KEY TECHNOLOGY AREA: Directed Energy Weapons

KEYWORDS: Directed Energy

RADIANT EMERALD - A CONCEPT OF OPERATIONS FOR THE INTEGRATION OF NATIONAL AND TACTICAL INTELLIGENCE ASSETS (U)

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The integration of live national and tactical signals intelligence (SIGINT) collection is a critical goal to meet the demands of today's warfighters. The Navy's answer to the national/tactical integration problem is RADIANT EMERALD. RADIANT EMERALD is the Navy TENCAP effort to develop the technology to disseminate "bent pipe" unprocessed audio data between a Regional Security Operations Center (RSOC) and ships equipped to receive the Global Broadcast Service (GBS).

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The primary focus of this thesis is to develop a Concept of Operation (CONOP) for RADIANT EMERALD. This thesis will also include background information on the supporting hardware and software communications architecture required to accomplish the RADIANT EMERALD mission. A secondary focus is to compare the RADIANT EMERALD concept and technology to a similar effort by the National Security Agency. Additionally, this thesis will recommend solutions for the efficient interface between deployed and shore bases operators with suggestions for possible other uses of the RADIANT EMERALD technology.

DoD KEY TECHNOLOGY AREAS: Space Vehicles, Command, Control, and Communications, Computing and Software

KEYWORDS: National and Tactical Integration, Streaming Media, Audio Collection

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Abstract is classified.

DoD KEY TECHNOLOGY AREAS: Sensors, Surface/Under Surface Vehicles - Ships and Watercraft

KEYWORDS: Classified

MULTI-SENSOR DATA FOR MARITIME SITUATIONAL AWARENESS (U)

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Abstract is classified.

DoD KEY TECHNOLOGY AREAS: Sensors, Surface/Under Surface Vehicles - Ships and Watercraft, Other (Intelligence)

KEYWORDS: Maritime Situational Awareness, Space-Based Sensors

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A PROPOSED FIRE SUPPORT COMMUNICATION ARCHITECTURE FOR EXTENDING THE LITTORAL BATTLESPACE (ELB) ADVANCED CONCEPT TECHNOLOGY DEMONSTRATION (ACTD) '01

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Extending the littoral battlespace (ELB) is vital to the United States Navy and Marine Corps. Fast, accurate, and reliable fire support will continue to be essential to the execution of Operational Maneuver From the Sea (OMFTS) and Ship-To-Objective Maneuver (STOM). The emergence of new technology has made these concepts possible. Technology will allow Marines to reach their objectives faster and farther than ever before. Information gathering, dissemination, and targeting will be key factors to the success of these new concepts.

The development of low earth orbiting satellites that provide a seamless command, control, communications, and intelligence (C4I) network will be necessary for ELB. This network will provide worldwide coverage, emphasize light forces with the ability to connect to larger forces and have a near zero footprint. The emerging communication architectures must have the capacity for voice, data, and video handling from high to narrow bandwidth. Developing a "light" communications architecture that supports these emerging concepts will allow ELB to be responsive for joint operations in the twenty-first century.

DoD KEY TECHNOLOGY AREA: Command, Control, and Communications

KEYWORDS: Extending the Littoral Battlespace, Operational Maneuver From The Sea, Ship-To-Objective Maneuver, Low Earth Orbiting Satellites

REMOTE SENSING SUPPORT OF TOMAHAWK LAND ATTACK MISSILE STRIKE COMBAT ASSESSMENT (U)

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Abstract is classified.

DoD KEY TECHNOLOGY AREAS: Battlespace Environments, Conventional Weapons, Sensors

KEYWORDS: Tomahawk Land Attack Missile, TLAM, Remote Sensing, Combat Assessment

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INTEGRATION AND NEW OPPORTUNITIES TO MEET THE CRYPTOLOGIC CHALLENGES OF THE 21ST CENTURY (U)

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The Unified Cryptologic Architecture and the Operational View of the Maritime Cryptologic Architecture establishes the direction of motion for cryptology of the future. While the information age has brought with it incredible advances in technology, one finds themselves right in the middle of significant advances every few months. As a result, the description of today's signal environment becomes not only broad in scope, but technically challenging as well. As technology and operational tactics and plans evolve, so must a new more supportive architecture. The architecture must be responsive to the operational warfighter and to those agencies and organizations participating in that support.

A national shift in the focus of maritime cryptologic systems is currently underway, with an emphasis on replacing inefficient, stovepipe approaches with common DoD-wide solutions and ensuring that new capabilities are compatible, interoperable, and meet the warfighter's needs.

Detailed analysis of the capabilities of National SIGINT Requirements Process (NSRP), Common Remoting System (CRS), and Collaborative Virtual Workspace (CVW) provides the backbone for development of an integrated dynamic tactical-national cryptologic partnership. This thesis details the integration of processes such as the newly proposed NSRP and cryptologic systems including CRS and CVW in order to postulate the adoption of a new tactical-national cryptologic partnership.

DoD KEY TECHNOLOGY AREAS: Sensors, Battlespace Environments, Command, Control, and Communications, Other (Signals Intelligence)

KEYWORDS: Signals Intelligence (SIGINT), Cryptology, National SIGINT Requirements Process, Common Remoting Systems (CRS), Collaborative Virtual Workspace (CVW), Tactical-National Partnership