Submarine Warfare in the 20th & 21st Centuries: A Bibliography

Compiled by Michaele Lee Huygen

Dudley Knox Library
Naval Postgraduate School
December 2003
# Report Documentation Page

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<table>
<thead>
<tr>
<th>1. REPORT DATE</th>
<th>2. REPORT TYPE</th>
<th>3. DATES COVERED</th>
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<tbody>
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<tbody>
<tr>
<td>Submarine Warfare in the 20th &amp; 21st Centuries: A Bibliography</td>
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<table>
<thead>
<tr>
<th>5a. CONTRACT NUMBER</th>
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</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5b. GRANT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>5c. PROGRAM ELEMENT NUMBER</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5d. PROJECT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5e. TASK NUMBER</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5f. WORK UNIT NUMBER</th>
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</thead>
<tbody>
<tr>
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</tbody>
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<thead>
<tr>
<th>6. AUTHOR(S)</th>
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<tbody>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</th>
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<tbody>
<tr>
<td>Naval Postgraduate School Dudley Knox Library Monterey, CA 93943</td>
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<table>
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</table>

<table>
<thead>
<tr>
<th>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</th>
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</thead>
<tbody>
<tr>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>10. SPONSOR/MONITOR’S ACRONYM(S)</th>
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<tbody>
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<table>
<thead>
<tr>
<th>11. SPONSOR/MONITOR’S REPORT NUMBER(S)</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Approved for public release, distribution unlimited</td>
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<table>
<thead>
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<th>13. SUPPLEMENTARY NOTES</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>14. ABSTRACT</th>
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<tbody>
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<table>
<thead>
<tr>
<th>15. SUBJECT TERMS</th>
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<tbody>
<tr>
<td></td>
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</tbody>
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| 16. SECURITY CLASSIFICATION OF: |
|--------------------------------|--|--|
| a. REPORT | b. ABSTRACT | c. THIS PAGE |
| unclassified | unclassified | unclassified |

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>UU</td>
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</table>

<table>
<thead>
<tr>
<th>18. NUMBER OF PAGES</th>
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<tbody>
<tr>
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</tbody>
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<th>19a. NAME OF RESPONSIBLE PERSON</th>
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Standard Form 298 (Rev. 8-98)
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Submarine Warfare in the 20th & 21st Centuries: A Bibliography

Compiled by
Michaele Lee Huygen

Dudley Knox Library
Naval Postgraduate School
December 2003
INTRODUCTION

There are constant motions in the sea caused by atmospheric and seabed activities, volcanic disruptions, marine animals, ships, and submarines -- all of which create what is called the ambient noise level of the oceans.

Today acoustics is the basis of both submarine and antisubmarine warfare: the single most significant element upon which all undersea warfare activity depends. When the submarine was first developed, its security lay beneath the surface of the ocean where it would not be seen. Today its security lies in its ability to avoid being heard.


This bibliography is a revised and expanded version of Submarine Warfare in the 20th Century, 2002. It is a selected bibliography listing books, periodical articles, and web sites related to submarine and antisubmarine warfare in the 20th century. Some entries have brief annotations taken directly from library cataloger's notes. To ensure a compact citation format, the series statement(s), when present, are in parentheses following the publisher statement and before the pagination. The letters "NPS/DKL," followed by location and call number information, identify the books held by the Naval Postgraduate School's Dudley Knox Library. Many of the journal articles are also accessible in the Dudley Knox Library. Consult with the Reference or Interlibrary Loan Department of your local library for advice on obtaining materials of interest to you.

This Bibliography will also available online at http://library.nps.navy.mil/home/bibs/submarine/

December 2003
# TABLE OF CONTENTS

## BOOKS & TECHNICAL REPORTS

### HISTORY OF NAVAL STRATEGY / WARFARE

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL</td>
<td>6</td>
</tr>
<tr>
<td>WWI</td>
<td>25</td>
</tr>
<tr>
<td>AMERICAN</td>
<td>11</td>
</tr>
<tr>
<td>AUSTRALIAN</td>
<td>14</td>
</tr>
<tr>
<td>AUSTRALIAN</td>
<td>27</td>
</tr>
<tr>
<td>BRAZILIAN</td>
<td>15</td>
</tr>
<tr>
<td>AUSTRIAN</td>
<td>28</td>
</tr>
<tr>
<td>BRITISH</td>
<td>15</td>
</tr>
<tr>
<td>CHINESE</td>
<td>17</td>
</tr>
<tr>
<td>CANADIAN</td>
<td>17</td>
</tr>
<tr>
<td>FRENCH</td>
<td>18</td>
</tr>
<tr>
<td>GERMAN</td>
<td>19</td>
</tr>
<tr>
<td>INDIAN</td>
<td>20</td>
</tr>
<tr>
<td>ITALIAN</td>
<td>21</td>
</tr>
<tr>
<td>JAPANESE</td>
<td>21</td>
</tr>
<tr>
<td>KOREAN</td>
<td>22</td>
</tr>
<tr>
<td>NEW ZEALAND</td>
<td>22</td>
</tr>
<tr>
<td>NORWEGIAN</td>
<td>23</td>
</tr>
<tr>
<td>SWEDISH</td>
<td>23</td>
</tr>
<tr>
<td>TURKISH</td>
<td>25</td>
</tr>
</tbody>
</table>

### SPECIAL TOPICS

#### ANTISUBMARINE WARFARE (ASW)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL</td>
<td>40</td>
</tr>
<tr>
<td>WWI</td>
<td>42</td>
</tr>
<tr>
<td>WWII</td>
<td>42</td>
</tr>
<tr>
<td>NPS THESES &amp; TECHNICAL REPORTS</td>
<td>44</td>
</tr>
<tr>
<td>OTHER THESES &amp; TECHNICAL REPORTS</td>
<td>95</td>
</tr>
</tbody>
</table>

#### CONFERENCES ON LIMITATION OF ARMAMENT

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHINGTON (1921-1922)</td>
<td>117</td>
</tr>
<tr>
<td>LONDON NAVAL CONFERENCE. (1930)</td>
<td>120</td>
</tr>
</tbody>
</table>

#### CONVOYS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL</td>
<td>122</td>
</tr>
<tr>
<td>WWI</td>
<td>122</td>
</tr>
<tr>
<td>WWII</td>
<td>123</td>
</tr>
<tr>
<td>ARCTIC</td>
<td>124</td>
</tr>
<tr>
<td>ATLANTIC</td>
<td>128</td>
</tr>
<tr>
<td>MALTA/MEDITERRANEAN</td>
<td>131</td>
</tr>
</tbody>
</table>
# PERIODICAL ARTICLES

## SUBMARINES – GENERAL

<table>
<thead>
<tr>
<th>Country</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>329</td>
</tr>
<tr>
<td>Australian</td>
<td>329</td>
</tr>
<tr>
<td>Austrian</td>
<td>331</td>
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<tr>
<td>British</td>
<td>332</td>
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<td>Canadian</td>
<td>332</td>
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<tr>
<td>Chinese</td>
<td>333</td>
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<tr>
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<td>333</td>
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<tr>
<td>Egyptian</td>
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<td>339</td>
</tr>
<tr>
<td>Indian</td>
<td>339</td>
</tr>
<tr>
<td>Indonesian</td>
<td>340</td>
</tr>
<tr>
<td>Turkish</td>
<td>348</td>
</tr>
</tbody>
</table>

---

## SUBMARINES BY COUNTRY

<table>
<thead>
<tr>
<th>Country</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>340</td>
</tr>
<tr>
<td>Israel</td>
<td>341</td>
</tr>
<tr>
<td>Italian</td>
<td>342</td>
</tr>
<tr>
<td>Japanese</td>
<td>342</td>
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<tr>
<td>Korean</td>
<td>342</td>
</tr>
<tr>
<td>Malaysian</td>
<td>343</td>
</tr>
<tr>
<td>Pakistani</td>
<td>344</td>
</tr>
<tr>
<td>Polish</td>
<td>344</td>
</tr>
<tr>
<td>Russian/Soviet</td>
<td>344</td>
</tr>
<tr>
<td>Singapore</td>
<td>347</td>
</tr>
<tr>
<td>South African</td>
<td>347</td>
</tr>
<tr>
<td>Swedish</td>
<td>347</td>
</tr>
<tr>
<td>Taiwanese</td>
<td>348</td>
</tr>
</tbody>
</table>

---

## ANTISUBMARINE WARFARE (ASW)

<table>
<thead>
<tr>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>349</td>
</tr>
</tbody>
</table>

---

## SUBMARINE CHASERS AND PATROL BOATS

<table>
<thead>
<tr>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>368</td>
</tr>
</tbody>
</table>

---

## SUBMARINE WEBSITES

## GENERAL

<table>
<thead>
<tr>
<th>Country</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>American</td>
<td>370</td>
</tr>
<tr>
<td>Australian</td>
<td>370</td>
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<tr>
<td>British</td>
<td>371</td>
</tr>
<tr>
<td>Canadian</td>
<td>371</td>
</tr>
<tr>
<td>Dutch</td>
<td>371</td>
</tr>
<tr>
<td>French</td>
<td>371</td>
</tr>
</tbody>
</table>

---

## BY COUNTRY

<table>
<thead>
<tr>
<th>Country</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
<td>371</td>
</tr>
<tr>
<td>Italian</td>
<td>372</td>
</tr>
<tr>
<td>Japanese</td>
<td>372</td>
</tr>
<tr>
<td>Polish</td>
<td>372</td>
</tr>
<tr>
<td>Singapore</td>
<td>372</td>
</tr>
<tr>
<td>Turkish</td>
<td>372</td>
</tr>
</tbody>
</table>

---

## MIDGET SUBMARINES

<table>
<thead>
<tr>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>372</td>
</tr>
</tbody>
</table>

---

## WWII SUBMARINE HISTORY

<table>
<thead>
<tr>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>372</td>
</tr>
</tbody>
</table>

---

## WWII SUBMARINE STATISTICS

<table>
<thead>
<tr>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>373</td>
</tr>
</tbody>
</table>
HISTORY OF NAVAL STRATEGY/STRATEGY/WARFARE -- GENERAL


Thesis (M.A. in International Relations), The Fletcher School of Law and Diplomacy, April 1991.


Thesis (M.A. in International Relations), The Fletcher School of Law and Diplomacy, April 1991.

NPS/DKL Location: THESIS D78873


NPS/DKL Location: BUCKLEY V27 A2


NPS/DKL Location: BUCKLEY V27 A2


NPS/DKL Location: BUCKLEY V27 A2


NPS/DKL Location: GENERAL V750 G46 1998


German translation of Jane's war at sea 1897-1997.

NPS/DKL Location:  GENERAL  DA89 .N32

NPS/DKL Location:  GENERAL  V53 .K44 1990

NPS/DKL Location:  GENERAL  V53 .K44 1989


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NPS/DKL Location:  GENERAL  VA620 .K55 2000


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**NPS/DKL Location:** GENERAL V53 .T43 2001


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**NPS/DKL Location:** GENERAL D436 .R7


**NPS/DKL Location:** GENERAL V53 .S66 2001


**NPS/DKL Location:** GENERAL V163 .T56


**NPS/DKL Location:** GENERAL V163 .T56 1984


**NPS/DKL Location:** REFERENCE V23 .N32 2002


Continued by: Naval Institute guide to combat fleets of the world. VA40 .C8

______. **The Naval Institute guide to combat fleets of the world.** Annapolis, MD: Naval Institute Press, c1990-. v.

Continues: Combat fleets of the world
NPS/DKL Location: GENERAL VA10 .V68

NPS/DKL Location: GENERAL E183.8.C5 Z42 1994

**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- AMERICAN**

NPS/DKL Location: GENERAL VA58 .B283 1994

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NPS/DKL Location: GENERAL VB231 .U54 D667 1983

NPS/DKL Location: GENERAL V63.R63 D86 2001

NPS/DKL Location: GENERAL VA50 .F74 1988

NPS/DKL Location: GENERAL VA58.4 .G46 1992

NPS/DKL Location: GENERAL VA50 .G68 1998

NPS/DKL Location: BUCKLEY V857 .H37 1997

NPS/DKL Location: GENERAL UA646.55 .N38 2000

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Thesis (Ph.D.), Harvard University, 1972.

Lott, Arnold S. A long line of ships; Mare Island's century of naval activity in California. Annapolis, United States Naval Institute, [1954]. 268 p.

NPS/DKL Location: GENERAL VA55 .M33 2000

NPS/DKL Location: FEDDOCS D 201.2:SU 1

NPS/DKL Location: GENERAL VA50 .M53 1991

by the U.S. G.P.O., Superintendent of Documents, 1996. (Contributions to naval history; no. 6). 348 p.
NPS/DKL Location: FEDDOCS D 207.10/4:6

NPS/DKL Location: GENERAL VA55 .T42 1997
Electronic access: http://www.nap.edu/html/tech_21st/tfnf.htm

NPS/DKL Location: GENERAL VA50 .O36 1991

NPS/DKL Location: GENERAL VA58.4 .O94 1995

NPS/DKL Location: FEDDOCS D 221.2:IN 8

NPS/DKL Location: GENERAL VA58 .P28 1988

Proceedings of a conference held at the University of Exeter, in July 1994.
NPS/DKL Location: BUCKLEY VA25 .N38 1996

NPS/DKL Location: GENERAL VA58.4 .R97


NPS/DKL Location: GENERAL E746 .T9

NPS/DKL Location: GENERAL VA58 V103 .U37 1994

NPS/DKL Location: GENERAL VA58 E841 .U89 1993

**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL --AUSTRALIAN**


NPS/DKL Location: GENERAL UA870 .S68 2001

Papers from "Maritime War 21" conference.


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- AUSTRIAN

NPS/DKL Location: GENERAL VA473 .V54 1996

HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- BRAZILIAN

NPS/DKL Location: GENERAL VA422 .B65 1988


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- BRITISH


NPS/DKL Location: BUCKLEY V103 .D6


NPS/DKL Location: GENERAL VC265.G7 G67 1988

NPS/DKL Location: GENERAL VA454 .K3

German translation of The rise and fall of British naval mastery.

NPS/DKL Location: GENERAL DA85 .K3


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NPS/DKL Location: GENERAL VA454 .M873 1995

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Based on the Lees-Knowles lectures delivered in the University of Cambridge, 1961.
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NPS/DKL Location:  GENERAL DA89 .W2

NPS/DKL Location:  GENERAL VA454 .W43 1982

**HISTORY OF NAVAL STRATEGY/WARFARE – GENERAL – CANADIAN**


Sarty, Roger F.  **The maritime defence of Canada.**  [Toronto]: Canadian Institute of Strategic Studies, c1996.  223 p.

**HISTORY OF NAVAL STRATEGY/WARFARE – GENERAL – CHINESE**

Austin, Greg.  **China's ocean frontier: international law, military force, and national development.**  St. Leonards, NSW, Australia: Allen & Unwin in association with the Dept. of International Relations and the Northeast Asia Program, Research School of Pacific and Asian Studies, Australian National University, Canberra, ACT, 1998.  (Studies in world affairs; 17).  415 p.


**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- FRENCH**


**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- GERMAN**


Partial contents: V. 2: The U-Boat


NPS/DKL Location: GENERAL  DD101 .S46 1984


1st-5th editions published under title: Seekriegsgeschichte in Umrissen by A. Meurer.

### HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- INDIAN


**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- IRANIAN**


**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- ITALIAN**


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- JAPANESE


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- KOREAN


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- NEW ZEALAND


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- NORWEGIAN


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- POLISH


HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- RUSSIAN/SOVIET


Abstract: *This thesis seeks to provide an historical understanding of Russian and Soviet naval developments. This historical basis is provided to complement technological analysis of Soviet naval concepts and systems. The origins of Soviet naval traditions are examined, beginning with the establishment of the ancient Russian state of Kiev, the birth of the Tsarist Navy (under Peter I), the origins of the Communist State and Navy, and concluding with the Soviet naval developments during the Second World War. In examining these developments significant naval victories (Sweden, 1721; and Tchesme, 1770) and defeats (Crimean, 1853; and Tsushima, 1905) are noted, along with non-combat administrative reforms. The employment of the Russian Navy in World War One and the Soviet Navy in World War Two are also examined. The conclusion is drawn that the primary mission of the Soviet Navy is to support the Soviet Army in a continental theater. This conclusion is based on the historical failure of the Russian and Soviet Navies in conducting blue-water operations (inferring a notion of perceived futility in attempting these operations), the historical success in conducting coastal operations in support of the army (inferring the utility of these types of operations), and the historical land combat bias of the Russian and Soviet Militaries.*


Contents: v. 1. Submarine warfare


NPS/DKL Location: GENERAL/REFERENCE VA573 .P598 1983


NPS/DKL Location: GENERAL/REFERENCE VA573 .P598 1986


NPS/DKL Location: REFERENCE VA573 .P598 1991

________, ed. *Soviet naval developments; prepared at the direction of the Chief of Naval Operations by the Director of Naval Intelligence and the Chief of Information, Department of the Navy, Washington, D.C.* Annapolis, MD: Nautical and Aviation Pub. Co. of America, c1979. 119 p.

Originally published under the title Understanding Soviet naval developments by the Office of Naval Intelligence, 1974.

NPS/DKL Location: GENERAL VA573 .S64
NPS/DKL Location: GENERAL VA573 .S3

**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- SWEDISH**


**HISTORY OF NAVAL STRATEGY/WARFARE -- GENERAL -- TURKISH**


**HISTORY OF NAVAL STRATEGY/WARFARE -- WWI – GENERAL**


Italian translation of Der Krieg in der Nordsee.

Japanese translation of Der Krieg in der Nordsee.

________. *War in the North sea [translated by E.C. Magdeburger]*. [Newport, R.I., Naval war college, Intelligence dept., 1931]. 3 v. in 2 v. 
English translation of Der krieg in der Nordsee.

Abstract: Translated from the official German naval history of the First World War, this account is based upon the war diaries of the commanding officers involved and makes extensive use of the texts of naval staff memoranda and instructions, operation and war orders, and German wireless messages. Concentrating on the North Sea area, the volume begins with an examination of the background of the conflict and the preliminary German preparations for the war vis-à-vis those of the British Navy, and then proceeds to the early operations of the two fleets during August 1914. The detailed treatment reflects the importance of this initial stage of the contest, in which are exhibited the maritime planning and determinations that set the course of the entire naval conduct of the war: the blockade by Britain and the German employment of the submarine and mine warfare. Relevant appendices, tables, and charts accompany each part.

English translation of Der krieg in der Nordsee


English translation of Der krieg in der Nordsee

NPS/DKL Location:  RESERVE  D580 .H34 1994

NPS/DKL Location:  GENERAL  D580 .H6


NPS/DKL Location:  BUCKLEY  D521 .R4
HISTORY OF NAVAL STRATEGY/WARFARE -- WWI -- AMERICAN

NPS/DKL Location: GENERAL  E182 .C63 2000

NPS/DKL Location: GENERAL  VA57 .C65 1987


"This work has been compiled from data provided by the historical section, United States Navy." Contents: [v. 1] Offensive operations, 1914-1915. -- [v. 2] The stress of sea power, 1915-1916. -- [v. 3] The United States in the War, 1917-1918.
NPS/DKL Location: BUCKLEY  D580 .F9

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HISTORY OF NAVAL STRATEGY/WARFARE -- WWI -- AUSTRIAN


German translation of The imperial and royal Austro-Hungarian navy.


NPS/DKL Location: GENERAL VA473.S663 1994

HISTORY OF NAVAL STRATEGY/WARFARE -- WWI -- BRITISH

NPS/DKL Location: GENERAL D639.C75 B43 1982
NPS/DKL Location: GENERAL D580 .B4

NPS/DKL Location: GENERAL D546 .B68 1989


NPS/DKL Location: BUCKLEY DA89 .E2


NPS/DKL Location: GENERAL D581 .H56 1986

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NPS/DKL Location: GENERAL V53 .K44 1989

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HISTORY OF NAVAL STRATEGY/WARFARE -- WWI -- GERMAN


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HISTORY OF NAVAL STRATEGY/WARFARE -- WWII -- GENERAL

NPS/DKL Location: GENERAL D810.S7 B35 1998

NPS/DKL Location: REFERENCE D767.9 .D86 1998

Contents: v. 1. The Battle of Normandy.-v.2. The Defeat of Germany.

NPS/DKL Location: GENERAL D767 .G68 1995

NPS/DKL Location: GENERAL D766 .G745 1998


A revised edition of the Naval Staff history, volumes 1A (text and appendices) and 1B (plans and tables). Based on a two-volume confidential manuscript issued in 1957 by the Naval Staff.

Also published: [London]: Collins, c1977; as The battle of the Atlantic, by John Costello and Terry Hughes.
NPS/DKL Location: GENERAL D770 .H94


German translation of Jane's naval history of World War II


NPS/DKL Location: GENERAL D750 .L62


Contents: Background and context: Soviet-German relations -- The national canvas for naval issues -- Navy to navy: coexistence and interface -- Navy to navy: competition -- Nazi-Soviet naval relations -- The naval dimension of the Hitler-Stalin pact -- Operations -- Basis nord -- Cruiser "L": from Germany with reticence -- Submarines and merchant cruisers -- Conclusion.

NPS/DKL Location: GENERAL VF347 .P66 1997

NPS/DKL Location: BUCKLEY D770 .P9

NPS/DKL Location: GENERAL D770 .R44 1990

HISTORY OF NAVAL STRATEGY/WARFARE -- WWII -- AMERICAN


NPS/DKL Location: GENERAL D770 .C9


NPS/DKL Location: BUCKLEY CT7.A42 G34 1995

NPS/DKL Location: GENERAL CT6 .O7 H66 1992

NPS/DKL Location: GENERAL VA58.4 .L32 1983

HISTORY OF NAVAL STRATEGY/WARFARE -- WWII -- AUSTRALIAN


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NPS/DKL Location: GENERAL D771.R73

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NPS/DKL Location: BUCKLEY D771 .B5


NPS/DKL Location: GENERAL VA513 .B4613 1974


NPS/DKL Location: BUCKLEY D771 .B5


NPS/DKL Location: GENERAL D770 .H6


NPS/DKL Location: BUCKLEY D771 .T88

NPS/DKL Location:  GENERAL  D771 .V9


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**HISTORY OF NAVAL STRATEGY/WARFARE -- WWII -- ITALIAN**


**HISTORY OF NAVAL STRATEGY/WARFARE -- WWII -- JAPANESE**

NPS/DKL Location:  GENERAL  D777 .D83


NPS/DKL Location: GENERAL  DS890.Y25 P6 1965


NPS/DKL Location: GENERAL  D777 .U5

**HISTORY OF NAVAL STRATEGY/WARFARE -- WWII -- POLISH**


HISTORY OF NAVAL STRATEGY/WARFARE – WWII – RUSSIAN/SOVIET


HISTORY OF NAVAL STRATEGY/WARFARE -- SPECIAL TOPICS

ANTISUBMARINE WARFARE (ASW) -- GENERAL


NPS/DKL Location: GENERAL V214 .S63 1986

NPS/DKL Location: GENERAL V214 .F73 2003

NPS/DKL Location: GENERAL V214 .G47 1986


NPS/DKL Location: GENERAL V214 .M55 1984


NPS/DKL Location: GENERAL V210 .M66

NPS/DKL Location: GENERAL V210 .P9


German translation of Aircraft versus submarine.

NPS/DKL Location: GENERAL V214 .S74 1987


NPS/DKL Location: GENERAL V214 .S8


ANTISUBMARINE WARFARE (ASW) – GENERAL -- WWI

NPS/DKL Location: GENERAL D581 .G7

NPS/DKL Location: GENERAL V214.H33 1984


NPS/DKL Location: GENERAL D590 .M47 2001

ANTISUBMARINE WARFARE (ASW) -- GENERAL -- WWII


NPS/DKL Location: GENERAL V214.5 .F735 1999

42


NPS/DKL Location: GENERAL D810.N4 P9


Originally published Annapolis, MD: Naval Institute, c1988.
NPS/DKL Location: GENERAL D773 .S78 2003

Prepared by Operations Evaluation Group, formerly operations Research Group, Office of the Chief of Naval Operations; Originally: "Confidential".
NPS/DKL Location: GENERAL D780 .S74 1990


NPS/DKL Location: GENERAL D784.G7 W45 1986B


NPS/DKL Location: GENERAL D770 .Y34 1983

ANTISUBMARINE WARFARE (ASW) -- NPS THESES AND TECHNICAL REPORTS

Abstract: *Energy Spreading Loss (ESL) is qualitatively defined as the reduction in peak power level due to energy spreading of a transmitted acoustic pulse in tune. An analysis of the impact of bathymetric geometry and sediment type on ESL and TL associated with the Low Frequency Active/Compact Low Frequency Active (LFA /CLFA) sonar operations was conducted utilizing the FEPE, FEPE SYN and EXT TD programs to model the time spreading of the acoustic pulse due to multipath propagation in shallow water. Both a Blackman windowed pulse and a Continuous Wave (CW) pulse were used in this analysis. The Blackman pulse had a center frequency of 244 Hz with a bandwidth of 24 Hz. The CW pulse had a center frequency of 244 Hz with a bandwidth of 0.0625 Hz. Model inputs were a geoacoustic description of the Tanner Bank region off the coast of San Diego and a typical late summer sound speed profile taken from the MOODS database. ESL and TL's impact on low frequency active sonar operations was determined as a function of bathymetry, sediment type, sound speed profile, and pulse length. The results showed that ESL is inversely related to pulse duration and at low frequencies is relatively uninfluenced by sediment type. When pulse lengths were reduced to less than 1 second, ESL became appreciable ( > 6 dB one way) and was an important segment of the active sonar equation. TL was found to be the dominating factor in LFA/CLFA operations for pulse lengths greater than 1 second and was greatly influenced by sediment type and sound speed profile.*
NPS/DKL Location: THESIS A2246
Electronic access:http://handle.dtic.mil/100.2/ADA341298

Abstract: There is a growing need within the Navy for methods for detecting discrete narrowband signals in a non-stationary background. This paper concerns itself with the application of digital processing and spectral analysis techniques toward that goal. The use of the fast Fourier Transform in estimating the power spectrum of a signal is described. The method involves sectioning the time record, making 'raw' estimates of the spectrum from these sections, and averaging these 'raw' estimates. It is shown that more stable estimates are available if the segments are overlapped and an optimum amount of overlap for the case of the Hanning window is found. It is shown that the stability of these spectral estimates can be interpreted as processing gain in the case of a discrete narrowband signal in additive noise. And finally, a brief description of signal detection theory applied to a human observer is presented to emphasize the flexibility that a human operator can bring to a signal detection system.


Abstract: The Advanced Air Deployable Array (AdDA), which is a modern air-dropped fiber optic ASW device, provides an opportunity for the rapid enclosure of a hostile submarine in shallow waters. This thesis explores the effect of the deployment depth, and effect of using longer or shorter AdDA array segments, on the performance of eight proposed AdDA deployment tactics which employ single or dual aircraft. It is shown that when the AdDA sinking rate is considered, several of the proposed tactics become infeasible for certain depth and submarine speed combinations. Still, today fiber optics offer unique capabilities for solving some of the U.S. Navy's and the Turkish Navy's problems in the future.


Abstract: The experiences of submarine warfare from WWI and WWII have generally dictated maximum speed when designing conventional submarines. Technological development of submarine and antisubmarine weapons, however, requires examination of submarine warfare and tactics. This thesis focuses on a coastal conventional submarine's ability to survive, as a function of its maximum speed, when attacked by a light antisubmarine warfare (ASW) torpedo. It also evaluates the maximum speed with which the submarine should be equipped to ensure a specified probability of survival. The measure of effectiveness (MOE) is the probability that the submarine, operating up to maximum speed and launching only one set of countermeasures, is not caught by the torpedo. The investigation builds on a discrete event simulation model. The systems simulated are a submarine, a light ASW torpedo, and a countermeasure system consisting of one decoy and four jammers. The results show that maximum speed of a submarine does affect the submarine's evasive performance between 12 and 18 knots. The simulated model reached a maximum probability of survival at 18 knots. That result should be regarded as a minimum since a real life system might require a higher maximum speed to reach its greatest probability of survival.


Abstract: This thesis sought to determine if the requirements for operation of the acoustic processing equipment now installed aboard P-3C aircraft is too complex for the acoustic operators, given their current amount of training. This was accomplished by using a test scenario designed to test for all of the skills and knowledge required by acoustic operator in the performance of his duties during the passive portion of the prosecution of a target. The results seem to suggest that the students that successfully complete the P-3C ‘Antisubmarine Warfare Operator’ rating training pipeline are acquiring an acceptable level of operator capability. In addition, this study seems to suggest that fleet operators who are recognized in fleet squadrons as master journeymen, are operating their ASW acoustic processing equipment to its fullest capability and without apparent operator deficiencies.

NPS/DKL Location: THESIS A7263

Abstract: This thesis analyzes the aircraft carrier based Tactical Support Center (CV-TSC) installation design from a human factors viewpoint. Starting with the threat, the mission of the CV-TSC is defined. A modular concept between man and machine is developed. Man’s role, tasks, and functions are identified and form the basis for recommended changes to the CV-TSC aboard the USS Constellation (CV-64) and general recommendations for all CV-TSC installations. (Author)
NPS/DKL Location: THESIS A729

Abstract: Ship defense in convoy operations against Anti-Surface Missiles (ASM) has been an important aspect of Naval Warfare for the last two decades. Countries in a state of conflict often conduct threatening operations in their own territories in order to slow or stop the enemy merchant ship traffic through the straits or littoral waters. Such littoral scenarios, the quantity and capability of ASM’s in non-NATO countries pose a significant threat to the safe operation of the NATO forces in the waters off of potentially hostile shores. In these operations the goals of the tactical commander are to design an optimal reaction platform (formation) and to determine an optimal strategy that will help him in multi-threat encounters. The scope and design in most anti-air warfare studies have been limited to evaluating the effectiveness of detecting sensors and weapon systems in a regular screen formation. The proposed model’s (Disposition Mission Model - DMM) characterization, however, is based on how to perform an effective, defensive disposition from a task force. In DMM we focus on usage of a graphical user interface and provide a user-friendly environment for analyzing new tactics in screen formations. The model, with its user interface, allows the user to build and run a convoy simulation, and see the results comparatively on the same interface. The analysis using this model has yielded significant insights towards the defense of a convoy by way of regression methods. It has been seen that positioning the escort ships within the threat sector reduces the damage on the HVU and also balances the defensive load of each defense ship for the incoming missiles. The model, with its graphical interface and simulation components, provides an initial approach for future analysts, not only in anti-air warfare defense of screen formations, but also in the areas of anti-surface and anti-submarine warfare.
NPS/DKL Location: THESIS A99423
Electronic access: http://library.nps.navy.mil/uhtbin/hyperion-image/00_Aydin.pdf

Abstract: In the current version of NPSNET there are two problems that prevent users or this virtual environment from achieving a realistic training experience. First, the motion of the vehicles is not built around realistic, physically based models. In particular, the motion of computer-generated sea-going vehicles is not based on the hydrodynamic models that reflect the motion of actual ships moving through water. Second, vehicles in NPSNET are currently controlled by a single individual; they lack the capability to be controlled by a team. This misrepresents the many actual military vehicles—submarines, tanks, helicopters, and others—that must be controlled by several people working together. The approach taken was to update the submersible vehicle class in NPSNET in two ways. A physically-based hydrodynamic model was used to control the vehicle’s motion through the virtual world. In addition, a network communications protocol was implemented to enable several remote individuals to control the same vehicle simultaneously. The result of this work is the creation of a computer-generated submersible vehicle whose motion is determined by a real-time hydrodynamic model so it moves through the virtual world according to physically based models. This submersible is also capable of being controlled by several remote individuals—effectively the same team members who would perform the job in the actual vehicle. This ultimately results in a more realistic user experience as well as a more effective training tool for NPSNET.

NPS/DKL Location: THESIS B1056

Issued as Naval Postgraduate School Technical Report (NPS-71BE75031) in conjunction with Alan B. Coppens and Don E. Harrison.
Abstract: PEAPS (Passive Environmental ASW Prediction System) is a relatively unsophisticated model which accepts input source and receiver parameters and then predicts sound propagation characteristics in an ocean environment, the corresponding transmission loss, and the probability of detection. The program was written for a programmable desk-top calculator for immediate deployment and operational testing aboard small ASW platforms. The program is also available in a form suitable for larger computers.

NPS/DKL Location: THESIS B3354

Abstract: The goal of this thesis is to examine the methodology used in the Antisubmarine Warfare Tactical Decision Aid (ASWTDA) in development by Sonalysts, Incorporated of Waterford, Connecticut under Navy contract. ASWTDA is a Computer Assisted Search (CAS) program which is designed as a tool to assist platform, unit or force commanders afloat and ashore in making tactical ASW decisions. First, a Classical Computer Assisted Search program is described as a basis of comparison for the methodology employed in ASWTDA. Then, the operations as performed in ASWTDA are described, followed by a probabilistic analysis. In the analysis sections, probabilistic support for the applied methodology is provided where applicable, and conceptual problems and possible solutions are cited where appropriate. Keywords: Target motion, Probabilistic analysis. (kr)

NPS/DKL Location: THESIS B545445

Abstract: TASDA, acronym for Tactical Airborne Sonar Decision Aid, is a computer simulation designed to select optimum sonobuoy pattern spacings given environmental parameters and submarine mode of operation. The program was designed to operate in a Tactical Support Center for briefing of flight crew personnel. Analytical methods and statistical models are used to investigate the TASDA program with a view towards modifying it for future aircraft inflight utilization. Some improvements are made to the TASDA model which reduce program run time and core storage requirements. A modified version of the TASDA program is developed as an initial step toward an inflight model. (Author)
NPS/DKL Location: THESIS B564

Abstract: A quantitative analysis was carried out on the performance of turboprop aircraft within a microburst windshear. The objective of the analysis was to provide specific flight procedures for optimal navigation through the windshear. The microburst windshear model used in the analysis embodied the severe characteristics of the microburst encountered by Delta Flight 191 during an approach to landing at Dallas/Ft. Worth, 2 August 1985. Different escape strategies were tested using the flight performance characteristics of the U.S. Navy's P-3 'Orion' and T-44 'Pegasus' aircraft. The three flight phases investigated were approach to landing, takeoff, and the low altitude ASW mission. Results from the analysis were coupled with the pilot's view point from which conclusions were drawn. The results of the analysis support a constant-pitch-angle escape procedure. The same procedural steps can be used for both aircraft in any configuration or situation with the difference being the degree of pitch to employ. The conclusions are in a format for integrating specific microburst escape procedures within the NATOPS programs for the P-3 and T-44.
NPS/DKL Location: THESIS B5886

Abstract: The advent of the missile firing submarine has added yet another dimension to the problem of defending convoys and task groups during ocean transit. The specific situation wherein the submarine must surface to fire a relatively short range missile against a convoy of ships is considered. The model developed considers several different problem parameters. It enables the calculation of probability of detection of the submarine, probability of killing the submarine before a particular missile is fired, and the expected number of missiles that the submarine will fire. Selected results from randomly selected parameter values are also presented. (Author)
NPS/DKL Location: THESIS B643

Abstract: This thesis investigated the number of In-Flight-Technicians assigned to a Navy P3C squadron, their contributions to the squadron's ASW capability in their dual roles as in-flight and ground repairmen, and the adequacy of the In-Flight-Maintenance-Kit. Tradeoffs between the number of In-Flight Technicians and ground avionics workers were evaluated as were various methods of the In-Flight Technician's ground and airborne utilization. Potential benefits associated with In-Flight Technician
assignment to Intermediate and Depot Level maintenance activities were also examined. The In-Flight Technician's contributions to the squadron's ASW capability were measured in Equivalent Aircraft Units which were a function of how many repairs were corrected and the impact on ASW capability of the systems repaired. (Author)

NPS/DKL Location: THESIS B6785


Abstract: *This report reviews the naval planner's basic menu of operational anti submarine warfare (ASW) strategical choices. Basic ASW strategies, discussed from a historical perspective, are: (1) destruction of the submarine (2) containment of the submarine, and (3) limiting the submarine's efficiency. The report has been prepared for inclusion in the International Military and Defense Encyclopedia (IMADE), scheduled for publication by Pergamon-Brassey's in 1991-92.*

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-56-88-01


Abstract: *This thesis presents an analysis and comparison of manpower costs of three options for the United States Navy Helicopter force structure through the year 2020. The first option, the basic plan, leaves the force structure as it is today. The second option assumes the mission to support the Military Sealift Command (MSC) is outsourced and combines the Helicopter Combat Support (HC) and Helicopter Antisubmarine Warfare (HS) communities into a community referred to as HSC. The third option realigns the force along missions performed by the SH-60Bs and CH-60 under a Helicopter Air Wing Commander (HAWC). All three options support the requirements set forth in the Helo Master Plan (HMP) and are based on the acquisition of the CH-60 helicopter along with the upgrade of all SH-60Bs and SH-60Fs to SH-60Rs. The analysis involved developing manning levels, by pay grade, for the three options and determining the differences in those manning levels. Manpower costs were allocated to the total personnel requirements, and differences in costs among the options were calculated.*

NPS/DKL Location: THESIS B803415

Electronic access: [http://handle.dtic.mil/100.2/ADA343363](http://handle.dtic.mil/100.2/ADA343363)


Abstract: *In airborne antisubmarine warfare there is a need to more accurately determine the positions of sonobuoys on the surface of the water. This report develops two algorithms which employ extended Kalman filters to determine estimated position. The bearing from the aircraft to the sonobuoy is the primary measurement. Range information is not available. The first algorithm is a six-state filter which was reduced from the 13-state system developed by the Orincon Corporation. Its states include relative position, relative velocity, and inertial misalignments. The second algorithm includes two cascaded Kalman filters. The primary two-state filters estimates sonobuoy position. A secondary filter estimates drift from information obtained from the primary filter. Both algorithms successfully estimated sonobuoy position for simulated aircraft data. The effect of aircraft-to-sonobuoy range, the frequency of measurement, and changes in altitude are also analyzed.*  (Author)

NPS/DKL Location: THESIS B8243

49


Abstract: **In response to recent significant improvements in soviet Submarine Technologies the Navy developed the Weapon System Improvement Program for the S-3A Viking. This program is an example of the dynamic nature of the environment within which the program manager operates. It provides the program manager with little control over certain events and the effects they have on their programs. An effective program manager will realize these limitations exist and attempt to strategically and flexibly manage the resources available to him as effectively and efficiently as his/her political environment will allow. However, this sometime happens at the expense of contractor inefficiencies and at a higher cost to the Government. In the DOD/DON world of scarce resources a thorough analysis of the competitive environment may provide useful insight into the S-3 Program Office and their efforts to complete the S-3 WSIP.**

NPS/DKL Location: THESIS B82435

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Abstract: **This paper examines the evolution of the U.S. Navy’s SH-60B, LAMPS Mk III aircraft and squadron methodology. It analyzes current HSL organization design and introduces alternative organization structures to support this new helicopter community when it is introduced in the fleet in 1983-84. It begins with a statement of the issue which includes a concise historical overview of the LAMPS program and discusses its tactical and support missions. It next examines the conventional naval air squadron organization methodology from which LAMPS squadrons are designed and manned. A statistical analysis of operational fleet HSL squadrons is presented which concludes that conventional squadron design methodology does not support the unique LAMPS community. Four general alternative organization models are proposed followed by a discussion of the possible utilization of the Naval Flight Officer in the LAMPS System. The paper concludes with a summary of the proposals from which organization redesign may result and offers recommendations to that process. (Author)**

NPS/DKL Location: THESIS B9218

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Thesis (M.S. in Management) Naval Postgraduate School, June 1995

Abstract: **This thesis develops multivariate models to estimate the effects of undergraduate academic performance and fully-funded graduate education on promotion to the ranks of Commander (0-5) and Captain (0-6) in the U. S. Navy. Using data extracted from the Officer Promotion History Files, two sample populations were selected for analysis: officers who appeared before the Commander promotion boards between fiscal years 1981 and 1994, and those who appeared before the Captain promotion boards during this same period. These data sets were further categorized into five warfare communities and two separate time periods; the period between 1981-1989 (the pre-drawdown), and the period between 1990-1994 (the drawdown). Ordinary least squares (OLS) and maximum likelihood log it regression models were employed to estimate the probability of being promoted to these two ranks. The findings reveal that**
graduate education and academic performance have positive effects on promotion probability for some, but not all, of the communities over the various time periods. Recommendations for further study are included.

NPS/DKL Location: THESIS B932


Abstract: This thesis presents an application of Multidimensional Scaling (MDS) used in the prioritization of ASW decision functions in the S-3A. The ASW decision space was divided into 14 discrete decision functions for the purposes of this analysis. The problem of developing a prioritization methodology was approached from two independent directions. First, an unconstrained sorting task was preformed to provide input to Multidimensional Scaling algorithm. The result of this analysis provided a three dimensional representation of the decision space with dimensional interpretation. Second, a series of ranking tasks were preformed to provide input to an Unfolding Analysis algorithm. The Generalized Distance Model was selected as the model most representative of the ranking data. The decision function coordinates for the MDS algorithm and the decision function coefficients for the Unfolding Analysis algorithm were combined in a regression-like equation to provide a prioritization methodology for the 14 decision functions of the S-3A ASW decision space.

NPS/DKL Location: THESIS C169


Abstract: The need for an enhanced display of the geographic distribution convergence-zone propagation in a region of shallow and variable bottom topography is demonstrated. A preliminary display is generated utilizing point-by-point computer processing of the convergence-zone minimum depth requirements with a large bathymetric data base for a region north of the Azores. The trade-offs between the accuracy of the preliminary output and cost (computer time and space) are discussed.

NPS/DKL Location: THESIS C175


Abstract: A moving target is detected at long range with an initial position given by a probability distribution on a grid of N cells. Also located on the grid is a searcher, constrained by speed, who must find an optimal search path in order to minimize the probability of target survival by time T. A branch-and-bound algorithm designed by Professors Eagle and Yee of the Naval Postgraduate School in Monterey, California, is successfully implemented in order to solve this problem. Within the algorithm, the problem is set up as a nonlinear optimization of a convex objective function subject to the flow constraints of an acyclic N x T network. Lower bounds are obtained via the Frank-Wolfe method of solution specialized for acyclic networks. This technique relies on linearization of the objective function to yield a shortest path problem that is solvable by dynamic programming. For each iteration, the lower bound can be found by use of a Taylor first order approximation. Implementation of this algorithm is accomplished by the use of a Fortran program which is run for several test cases. The characteristics of the solution procedure as well as program results are discussed in detail. Finally, some real world applications along with several
questions requiring further research are proposed. Keywords: Thesis; Integer programming; Antisubmarine warfare.

NPS/DKL Location: THESIS C186275

Abstract: A systems engineering approach to the design of a ship conversion to satisfy the requirements for a Surface Warfare Test Ship (SWTS) to be employed by the Port Hueneme Division of the Naval Surface Warfare Center is presented. The ship described would meet test needs for future weapons and sensor systems and provide limited test capability for future hull, mechanical and electrical systems. The current Self Defense Test Ship is over 45 years old, approaching the end of its useful life. A conversion of a decommissioned SPRUANCE (DD 963) class ship is the basis for the replacement Surface Warfare Test Ship. The study proceeds from mission needs and operational requirements through a functional analysis and study of threat weapons to be employed against the SWTS. After summarizing the characteristics of a SPRUANCE Class ship, the study reports an analysis of four alternative conversion schemes. The alternatives are described, with the rationale for choosing that considered best. The chosen alternative is then described and analyzed in several important areas of concern including combat systems functionality, signature characteristics, engineering plant and habitability for test personnel. The fitness of the proposed design for several special evolutions is also described, and alternatives for further enhancing performance are presented.
NPS/DKL Location: FEDDOCS D 208.14/2:NPS-ME-00-001
Electronic access: http://handle.dtic.mil/100.2/ADA374332

Abstract: The primary purpose of this thesis is to demonstrate some principles of combat modeling using programs for the Radio Shack TRS-80 Model 100 computer. In addition to the combat modeling, the thesis includes several utility programs for the M100 of interest to students of operations analysis. The combat modeling programs include an antisubmarine warfare (ASW) detection simulation, a Kalman filter, and a Lanchester differential equation simulation. The utility programs include a matrix algebra program, a numerical double integration program for zero degree of difficulty problems. The integration program is also written as a subroutine that can be included in other programs. The matrix algebra includes a simultaneous linear equation solving subroutine which can be used in other programs. All programs are written in M100 BASIC. Documentation includes an explanation of the input required, the output produced, and the components of each program, and sample problems. The chapter on geometric programming includes a tutorial on the mathematical basis for that technique. (Author)
NPS/DKL Location: THESIS C27436

Abstract: The Antisubmarine Warfare System Evaluation Tool (ASSET) is a generic high-level antisubmarine warfare (ASW) modeling tool, designed to aid ASW personnel in the development and refinement of ASW top-level warfare requirements and the ASW Master Plan. The primary objective of this thesis is to analyze and implement the improvements suggested in previous evaluations of various sub-areas of ASSET. The glimpse rate model for submarine detection used in ASSET has been

52
substituted with compound Lambda-Sigma jump model. There is a different target radiated frequency in each environmental region. Each target will have its own detection rate to reflect the differences in its operating characteristics. Multiple engagements between platforms are used to eliminate the limitations of interaction between opponent platforms. The glimpse rate model is used to determine detection opportunities of maritime patrol aircraft (MPA) and to approximate a continuous-looking sensor pattern. A different criterion of selecting search probability area (SPA) and MPA pairs using the ratio of MPA's time on-station over the SPA size was implemented. The feasibility of converting current ASSET code to CLOS was investigated. In addition, part of the code was converted to CLOS.

NPS/DKL Location: THESIS C37156


Abstract: This paper discusses specific accomplishments and problems regarding naval models in the RAND Strategy Assessment System (RSAS), and makes recommendations for priorities desired by the Naval Postgraduate School in the RAND program for FY 89. Emphasis is on the improvements needed to conduct research on the inter-relationship between warfare at sea and the war ashore. Partial Contents: Naval Warfare Priorities- Carrier Battle Group Improvements; Nuclear Forces; Antisubmarine Warfare; Strategic Lift - Sea; Ocean Surveillance; Amphibious Warfare; Mine Warfare; Logistics. (kr)

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-56-88-023


Abstract: This thesis examines a two-person zero sum game where a submarine, after revealing his position by causing a flaming datum, is hunted by a helicopter which arrives on the scene after a time delay. Various helicopter and submarine strategies are explored and simulation runs are used to determine the detection probability (payoffs) for each combination of helicopter and submarine strategy. The value of the game (detection probability) with the related optimal strategies is then obtained using linear programming. A modified random search equation is also derived using probabilities of detection obtained from different combinations of parameters used in the game. Similar and related games are also discussed with emphasis on the differences in assumptions made and approaches taken in order to solve the problem. (sdw)

NPS/DKL Location: THESIS C4783


Abstract: Mazeika's method for forecasting mixed-layer (thermocline) depth of the upper ocean layers is discussed along with a newer version of this method developed by James. Using Mazeika's method primarily, a verification for the Northeast Pacific Ocean was completed with data from Ocean Weather Stations PAPA (50N, 145W) and NOVEMBER (30N, 140W) and a point named MIDPOINT (40N, 140W). The results indicate Mazeika's method is successful at Station PAPA more than seventy five percent of the time during the heating season followed by a rapid decline as the cooling season begins. The method should be useful in the entire Central Subarctic Domain as described by John P. Tully. The method fails at NOVEMBER and MIDPOINT producing less than thirty percent success in prediction. James' version did not improve the results obtained at Station NOVEMBER. This failure appears to be due to the controlling parameters for processes in the Subtropic or Transitional oceanographic regions (which include NOVEMBER and MIDPOINT); these differ from parameters controlling oceanic processes in the
Pacific Subarctic region (Station PAPA), which resemble those involved in the Atlantic region for which Mazeika’s method was developed. Climatology data which can be used to obtain surface and 400-foot level temperature are also tested. The results indicate these data are very useful and accurate in determining the stability index required of Mazeika’s method.

NPS/DKL Location: THESIS C4788

Abstract: *Simulation generated probabilities for an Anti-Submarine Barrier composed of submarines are examined from a statistical viewpoint. A probabilistic model which is not generally considered to be applicable to this case is demonstrated to be statistically supported. The applicability of the model is justified probabilistically. A statistical estimating relationship is then developed to estimate the sole input parameter from submarine FIGURE-OF-MERIT.***

NPS/DKL Location: THESIS C5346

Abstract: *Concepts commonly found in ASW search are used to model the flow and detect mobile launchers for short range ballistic missiles. Emphasis is on detection and destruction of the launcher before launch. The benefit of prehostility intelligence and pre-missile-launch prosecution, the backbone of successful ASW, is revealed through the analysis of a circulation model which reflects the standard operations of a third world mobile missile launcher during hostilities. A decision model is constructed and analyzed to give insight into the development of pre-hostility intelligence policies.*

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-OR-93-009

Abstract: *This thesis analyzes the operational environment and task variables of the Tactical Coordinator in the S-3A for possible application of color coding in the display symbology in the multi-Purpose display. Beginning with the ASW threat to the carrier force under the CV concept, the missions of the S-3A are presented. The roles, tasks and functions of the Tactical Coordinator are identified and form the basis for an analysis of the need of color in airborne displays. Current display design requirements and discrepancies in the S-3A are discussed as a basis for areas of color application. Color research recently conducted is reviewed with the results directed toward the symbology currently used in airborne displays. (Author)*

NPS/DKL Location: THESIS C7154

Abstract: *This report provides an introduction to the SONAR equations for those interested in underwater sound as applied to ASW but lacking either the mathematical background or the time for a more rigorous presentation. Earlier versions of these notes were developed for Continuing Education...*
courses presented at Moffett Field, California, and Naval Torpedo Station, Washington. Additionally, these notes have been in demand for certain courses at the Naval Postgraduate School. While this is the text for these courses and should be supplemented by lectures, we have attempted to design the material so that it is reasonably self-explanatory, communicating many of the essential concepts without requiring extensive verbal amplification. The unusual format has been deliberately chosen to facilitate these goals, and our experiences in presenting these materials have seemed to justify this choice. It is assumed that the reader has some familiarity with trigonometric functions and either has or will develop with the aid of the appendix the facility of handling scientific notation and logarithmic operations. (Author)

NPS/DKL Location: GENERAL VK388 .C7

Revised of Rept. no. NPS-61SD-76-071, ADA030034.
Abstract: This report provides an introduction to the Sonar equations for those interested in underwater sound as applied to ASW but lacking either the mathematical background or the time for a more rigorous presentation. While this material should be supplemented by lectures or a study guide, we have attempted to design the material so that it is reasonably self-explanatory, communicating many of the essentials concepts without requiring extensive verbal amplification. The unusual format has been deliberately chosen to facilitate these goals, and our experiences in presenting these materials have seemed to justify this choice. It is assumed that the reader has some familiarity with trigonometric functions and either has or will develop will the aid of the appendix the facility of handling scientific notation and logarithmic operations.

NPS/DKL Location: GENERAL VK388 .C71

Also issued as Naval Postgraduate School Technical Report NPS68-82-005.
Abstract: Predicting the thermal structure of the oceans is of importance to the Naval tactician, logistician, or search and rescue coordinator. Understanding the structure of the oceans provides valuable insights to those who must utilize the oceanic environment effectively in their day to day operations. Today, recent information about an area is limited to point observations of single bathythermographs. Few models produce an accurate picture of the ocean environment that can be used for updating tactics to conform to a changing situation. Producing a reliable prediction of conditions for a large area, while using limited resources, is the basic objective of this paper. Satellite infrared imaging of the ocean surface has been used effectively to map sea surface temperature patterns. Such sea surface temperature patterns can be used, along with climatology, to identify subsurface thermal structure in an ocean area according to results of this study. More accurate inputs can be made to range dependent acoustic prediction models, thus improving the antisubmarine warfare environmental predictions available to fleet users.

NPS/DKL Location: THESIS C75956

Abstract: The employment of manual tactical gaming in a training environment is discussed, outlining the advantages and disadvantages of this method of training in the context of shipboard requirements. A
two-sided, manual tactical war game is described and rules provided for play of the game. The utility of
the game in assisting Commanding Officers and Training Officers in training junior officers using the
Personnel Qualification Standard (PQS) System is described, with recommendations for further use of the
game as a possible tactical training tool.
NPS/DKL Location: THESIS C777

Abstract: Acoustic sensors, traditionally thought of as the mainstay of modern ASW's means of
detection and localization, are rapidly becoming secondary in the littoral zones to active sensors such as
radar. The coastal region has a dynamic meteorological environment dominated by surface and near-
surface ducts which influence sea clutter. Accurate, timely description of the effects this changing
environment has on sensor performance is mandatory for the ASW tactitician to utilize his sensors. The
Radio Physics Optics (RPO) program and the Engineer's Refractive Effects Prediction System (EPEPS)
are used to evaluate influence of a measured environment. Both prediction systems are then applied to a
Gulf of Oman winter environmental profile with five generic radars operating parameters. EREPS is used
to evaluate factors affecting Wallops Flight Facility Space and Ranging Radar (SPANDAR) detected sea
clutter in the littoral zone off the United States East Coast.
NPS/DKL Location: THESIS C7829

Abstract: During January 1979 VP-31, the West Cost P-3 Fleet Replacement Squadron, implemented
an Instructional System Development based training program. Due to monetary, manpower, and time
constraints, the evaluation phase of the new training program was not completely developed or
implemented. This thesis examines the current status of the external evaluation portion of the new
training program in an attempt to determine the feasibility of its completion and implementation. The
external evaluation plan is related to the Interservice Procedures for Instructional System Development
Model. From this analysis, a better understanding of the plan is gained and recommendations for an
improved external evaluation program and training system are presented. (Author)
NPS/DKL Location: THESIS C813

Abstract: A theoretical model was developed which can predict discrete frequency far-field radiation
patterns of submerged submarines from near-field measurements. The model developed uses the
Helmholtz integral equation and the assumptions of the DRL method of near-field measurements. The
DRL working formula is further modified by using a plane surface of integration and restricting the far-field
points of interest to a horizontal plane containing the source. These assumptions and restrictions lead to
a mathematical solution of the Helmholtz equation which is in the form of a Fourier transform. Near-field
measurements on a horn speaker in an anechoic chamber were taken and the far-field beam pattern
predicted by the model developed, using a simple computer program containing a Fourier transform routine. Computed beam patterns were in satisfactory agreement with measured far-field beam patterns, errors being concentrated in the outer side lobes from the acoustic axis. Problems which would be encountered in applying this model to at sea acoustic measurements are discussed.

Abstract: This thesis looks at the Antisubmarine Warfare Systems Evaluation Tool (ASSET), written by Metron, Incorporated for OP-71, and how it relates to a current threat environment. ASSET is a campaign level ASW Monte-Carlo simulation intended for developing ASW Master Plans, top-level war fighting requirements (TLWRs), appraisals, and assessments. ASSET, delivered in 1990, was written from a U.S.-Soviet conflict perspective, and needs some restructuring to be able to provide conflict Measures of Effectiveness using platforms that are expected in a regional war. Included as suggested improvements are: a conventional submarine addition with major emphasis on power plant abilities and limitations, improvements to the surface group-submarine interaction; and improvements and additions to the methods of detection available to the objects in simulation.

Abstract: The report modifies an existing sonar range prediction model for the AN/SQS-23 in such a manner as to attain detection range data in consonance with exercises from which the original data was extracted. It also shows personnel a method for incorporating more than one ship in the model. This model will assist users in ascertaining the number of units required to perform a given antisubmarine task.

Abstract: The problem of Anti-Submarine Warfare early in the next century is examined. Nonacoustic detection methods including magnetic anomaly detection, laser radar, and hydrodynamic detection are examined. A simple analysis of their relative effectiveness is made.

Abstract: This thesis critically reviews twenty-two articles from the Soviet Naval Digest, Morskoy Sbornik, dealing with a wide spectrum of measures of effectiveness such as individual time efficiency, ASW search effectiveness, command decision efficiency, effectiveness of ASW training, measures of force control, and others. These Soviet measures of effectiveness are categorized by level of combat
action. Although there is some question about the specific Soviet meaning of the translations, this thesis uses the translator's rendering of the basic units of Soviet Naval organization; individual, subunit (podrazdelenye), unit (chast'), and force (soyedinenyiye). The levels of combat action above force (generally agreed to be named front (front), and TVD (Teatr Voyennykh Deystviy), are not included in this study. The articles illustrate the Soviet tendency to organize their operations research along the same lines as the units of naval organization and indicate that the most basic measure of naval ship utility is combat effectiveness. (Author)

NPS/DKL Location: THESIS D16177


Abstract: Signal Processing for Antisubmarine Warfare is a short course in electrical signal processing fundamentals and their applications in the field of antisubmarine warfare. It contains an introduction to Fourier transforms and their properties, sampling and quantization, filters and bandwidth requirements, random signals and noise, and an introduction to four types of processing equipment; the DELTIC, energy detectors, correlation detectors, and beamformers. Course objectives are given in terms of specific questions which a person completing the course should be able to answer. The course text and illustrative material is contained in the appendix to the thesis. The course is designed to be presented in the Fleet to the personnel involved with the operation and employment of detection equipment to provide them a better understanding of the operations accomplished by their equipment and to develop in them a better appreciation of the problems and limitations associated with signal detection in the antisubmarine warfare environment.

NPS/DKL Location: THESIS D174832


Abstract: An application of the statistical decision process to the problem of ASW tactical decision is investigated. The Bayesian decision process is utilized. The basic ASW decision problem with emphasis on the uncertainty aspect of a possible submarine contact is analyzed. A mechanism is developed to formally connect the general problem areas.

NPS/DKL Location: THESIS D235


Abstract: Since the all volunteer force came into being, retention of military personnel beyond their first enlistment has become an increasingly important problem, especially for the U.S. Navy. Yearly retention conferences have been held for the purpose of developing plans to reduce turnover. The results of the latest conference brought the focus of attention to better leadership and management training of U.S. Navy personnel. Among the techniques that deals with the problems of absenteeism and turnover is job enrichment. The main thrust of job enrichment is to increase retention by increasing work satisfaction. Job enrichment as a management technique focuses on the basics of employee motivation and work behaviors. It aids the managers in identifying the components which comprise a job, and enables them to determine satisfying components that can be enhanced and dissatisfying components that can be diminished or eliminated.
NPS/DKL Location: THESIS D27


Abstract: The SEATAG EXTENSION will revise and suggest optional and alternative rules for the game SEATAG: A Sea Control Tactical Analysis Game. Alternative rules are proposed for damage assessment, detection, classification, targeting, weapon's effectiveness, and ASMD close in weapon systems. Air-to-air combat tables have been revised to include the latest additions to both the United States and Soviet naval aircraft inventories. Optional rules will incorporate electronic warfare, battle damage repairs, miniature ship model combat, and use of the Tomahawk cruise missile.

NPS/DKL Location: THESIS D4588


Abstract: The Advanced Air Deployable Array (AdDA) is an air-dropped undersea warfare device for detection of an enemy submarine in the shallow waters region. Previous studies have introduced six tactical deployment methods by C-130 aircraft. This thesis addresses one of the methods, called Bound the Expanding Farthest-On Circle. Changes in deployment rules are suggested, and feasibility conditions identified. A model is developed showing how the isolation area where the submarine is to be contained, and the number of needed array segments, can be reduced. Also, as the main work of this study, the effective deployment angles for successive AdDA cable are determined for C-130 pilots. Today these cables, because of their advantages and great utility, can give unique solutions in shallow water tactical operations.

NPS/DKL Location: THESIS D4818


Abstract: A method is developed to analyze and compare the effectiveness of ASW vehicles. The measure of effectiveness is the probability that the vehicle, after detecting a submarine with passive sensors, can transit to the contact area and re-establish contact with the submarine. A computer simulation is developed and an example using three hypothetical ASW vehicles is illustrated. (Author)

NPS/DKL Location: THESIS D69


Abstract: There is currently little data available for trend analyses of tilt-rotor aircraft performance. This study analyzed the sensitivity of predicted tilt-rotor performance to variations in six design parameters: disk loading, tip speed, solidity, download, wing loading, and wing thickness ratio. Two mission profiles were analyzed: A combat search-and-rescue mission and an antisubmarine warfare mission. A tilt-rotor preliminary design code was used to perform computer simulations; and data available from independent
tests completed by NASA and the military were encoded in the input data decks. Results were presented as graphs of performance aspects plotted against the parameters varied. Because the study was a trend analysis, no specific conclusions were drawn but a summary was made of the more significant results. It is hoped that the results of this project can serve as a guide to preliminary selection of design parameters for tilt-rotor configurations that would be suitable for a broad range of military and civil applications.


Abstract: The purpose of this technical report is twofold: 1) to critically examine the ITDA ASW barrier and area search models for mathematical accuracy and modeling reasonableness, and 2) to report on the use of ITDA programs on USS CARL VINSON (CVN 70) during a 16 day period of high intensity, exercise operations.


Abstract: Airborne anti-submarine warfare operations require a means of precise tactical navigation relative to an air-dropped sonobuoy pattern. Advantages and disadvantages of navigational techniques which could be used to solve this problem are discussed. An analysis is made of a previously proposed method to solve this problem by sonobuoy ranging concepts. The design of a prototype sonobuoy ranging system is described, and a preliminary evaluation is made of the accuracy of the prototype system.


Abstract: This joint thesis analyzes the carrier-based Tactical Support Center (CV-TSC) design from a human factors engineering viewpoint. Beginning with the ASW threat to the carrier force under the CV concept, a definition of the mission of the CV/TSC is presented. System functions are identified and developed into man-machine relationships of the CV/TSC. A comprehensive, albeit general, description of TSC components is included as part of the system analysis. Man's role, functions and tasks in the CV/TSC are identified and form the basis for alternatives to the current TSC display/control console.


Abstract: To enhance insight into a war at sea, a general, aggregated and highly flexible model of the ASW campaign is offered. This thesis provides a simple and usable circulation model template. The
generality and simplicity of the model allows for 'jointization' of an ASW campaign by allowing the user to utilize other resources to define the force mix. The model is designed, first and foremost, to examine the change in the marginal effectiveness of friendly ASW forces due to changes in force level, mix, effectiveness, and employment strategies. The model is keyed to the interaction of a threat submarine with friendly ASW forces and merchant or military shipping. Specific features of the model provide for four unique attack regimes. The in port and operational regimes control friendly attacks on a daily basis while the outbound and inbound regimes control barriers by events. The campaign model is a deliverable product programmed using Borland(registered) Delphi for use in Microsoft Windows.


Abstract: This study is the first reported analysis of coupled mixed layer-acoustic model systems. This analysis emphasizes the performance of the combined systems rather than the acoustic or ocean models separately. Acoustic variability of the coupled model systems was studied in terms of the median detection range (MDR). Synoptic time variations of MDR as a function of figure of merit, frequency and receiver depth were analyzed during the month of May 1980 at OWS 'Papa' in order to provide a better insight into the operational capabilities of model systems to accurately represent the actual oceanic variability. The results of this limited analysis revealed that the model systems displayed more day-to-day acoustic (MDR) variability than did direct environmental input(BT). The capability to accurately model the thermal structure was reviewed with the following results. No significant correlation was observed between the EOTS model and the actual BT mixed layer depths while there appeared to be a strong positive correlation between the ODT model (driven by atmospheric forcing) and the BT mixed layer depths. Moreover, a possible lag of two days was observed in the EOTS model mixed layer depth relative to the observed mixed layer depth time series.


Abstract: This report describes an empirical analysis of a motion model that has been used to generate random submarine tracks for an antisubmarine warfare tactical decision aid. The model describes a submarine's motion as a series of transitions between the square cells of a grid that covers a defined operating region. A 3 x 3 transition matrix is associated with each cell of the grid which determines the submarine's transitions from a cell. The set of transition matrices define a Markov process. Despite its discrete nature, this Markov track generating process has been called a diffusion process in antisubmarine warfare tactical decision aid literature. The transition matrices are determined by tracks generated by an auxiliary stochastic process that is presumed to be of higher fidelity but more costly to implement than the Markov process.

Abstract: A study was conducted in an area off the Hellenic west coast to examine the spatial and time variability of various oceanic parameters, with special emphasis on those effecting ASW operations. Propagation loss runs were conducted using PE and RAYMODE models. The reactions of both models to different bottom morphology and sound speed profiles (seasons) were examined. Between the two models, the PE model was found to be closer to reality than RAYMODE. Results suggest that the application of these models can improve the understanding of sound propagation in the Hellenic seas. The bottom modeling program, BLUG, appears to need improvement.

NPS/DKL Location: THESIS F663525


Abstract: The objective of this study is to investigate the utility of acoustic tomography for performance assessment of a generic low frequency active sonar system. The performance of the sonar is simulated using tomography-derived sound speed data versus a range independent ocean model. The ocean environment used in the simulation is 159 tomographic snapshots of the Barents Sea Polar Front, taken every 5 minutes in August 1992. The modeled sonar system consists of a 1000 Hz source with a source level of 205.5 dB and a towed horizontal array of hydrophones. The system is derived from unclassified parameters of ATAS (Active Towed Array Sonar), built by Thomson Sintra ASM and British Aerospace SEMA, and the experimental ALF sonar, designed by FEL-TNO (the Netherlands) and built by Thomson Sintra ASM. The tomographic images over a range of 26 km provide a realistic ocean in which system performance is assessed. This study used a broadband, coupled normal mode, propagation model and assumed a noise-limited condition. The probability of detection calculated as a function of time for 13 hours is compared with that estimated using a range- and time-independent assumption. The utility of coastal acoustic tomography for tactical applications is discussed. (AN).

NPS/DKL Location: THESIS F782313


Thesis (M.S. in Operations Research)--Naval Postgraduate School, 1970

Abstract: In airborne anti-submarine warfare operations there is a critical requirement for maintaining an accurate relative plot of the sonobuoys with respect to the aircraft. This study proposed a method for locating sonobuoys in a pattern using aircraft-to-buoy slant range information. The method did not use triangulation procedures and attempted to minimize the restrictions placed on the aircraft. The study showed the feasibility of the proposed methodology and the approximate errors to be encountered. (Author)

NPS/DKL Location: THESIS F86


Thesis (M.S. in Operations Research)--Naval Postgraduate School, 1980

Abstract: To enhance insight into a war at sea, a large-scale, aggregated, and highly flexible model of the ASW campaign is offered. The model was designed, first and foremost, to examine the change in the marginal effectiveness of friendly ASW forces due to changes of force level, force mix, and force employment strategies. The model is keyed to the interaction of the threat submarine force with friendly ASW forces and merchant or military shipping. Specific features of the model provide for threat deployment options, allocation of friendly forces, attrition to threat and friendly forces, aggregation of friendly ASW force performance, sensitivity to force levels, deployment of submarines within 'wolfpacks'
and coordinated barrier stations, and parametric treatment of other warfare area effectiveness. The campaign model has been programmed in the APL/360 language for use on an IBM 360-67 computer.

NPS/DKL Location: THESIS F8974

Abstract: Advances in nuclear and diesel-electric submarine technology have reduced the effectiveness of passive means of detection. The United States is faced with a multipolar threat in part due to the proliferation to Third World nations of advanced diesel-electric submarines. The use of active sonar must be explored to gain back the detection advantage the United States submarine force has enjoyed in the past. The use of bistatic sonar reduces the counter-detection threat resulting from active sonar.

NPS/DKL Location: THESIS G1436

Abstract: A methodology is developed to assist in the evaluation of competing proposals for HS/HSL consolidation. Six criteria are developed to allow a quantitative measure of critical personnel, cost, and operational issues. The criteria are incorporated into a spreadsheet model that can evaluate five options simultaneously. Decision maker participation is required to derive a set of weights that represent the relative importance attributed to each criteria. Five options currently under consideration as candidates for consolidation are examined. Analysis is conducted to determine the effect different weight values have on the optimal solution. A sample run of the model is conducted to demonstrate its use. (KAR) P. 2.

NPS/DKL Location: THESIS G18056

Distribution Limitation now Removed.
Abstract: The relative distance between various Antisubmarine Warfare vehicles is an important parameter for the evaluation of sensor equipment. This thesis presents a computer model, utilizing a time dependent error navigation system, Omega, for the determination of this relative distance parameter. A methodology for predetermining a relative distance error distribution for a specific area by simulating various Antisubmarine Warfare vehicle tracks from known navigational errors has been established. Attempts to smooth estimated tracks of Antisubmarine Warfare vehicles which receive the same time dependent navigational information simultaneously was found not to be advisable as this disturbs the correlation of navigation error between the vehicles. (Author)

NPS/DKL Location: THESIS G205

Abstract: The purpose of this thesis is to determine whether the Armed Services Vocational Aptitude Battery (ASVAB) scores, specifically the composite of ASVAB subtests (AR + 2MK + GS) used to predict
eligibility for formal training in the Aviation Antisubmarine Warfare Operator (AW) rating, can actually predict the success or failure of enlisted personnel attempting the P-3 fleet readiness squadron (FRS) Acoustic Operator syllabus. This was accomplished by computing a Pearson Product - Moment Correlation Coefficient, corrected for restriction in range, to determine the correlation between ASVAB subtest and composite scores and success or failure in the FRS syllabus. The results indicate that ASVAB scores are only slightly predictive of performance.

NPS/DKL Location: THESIS G5477


Abstract: The subject of this thesis is an investigation of the effect of using the Lambda-Sigma jump process in the acoustic detection component of APAIR. A computer simulation was developed which is similar to the sonobuoy field versus submarine engagement model found in apair, the Navy's general ASW model. This simulation was then modified to incorporate the Lambda-Sigma jump process and the effect of this modification is discussed. In order to check the structural validity of the simulation models, results that were obtained by using them are compared to results that were obtained by using an analytical model called the random search model.

NPS/DKL Location: THESIS G566


Abstract: The Naval Tactical Game (NAVTAG) Training Systems are to become the standard war gaming computers in fleet use to train Surface Warfare Officers in tactical operations. As modern weapons platforms are developed, they need to be modeled into NAVTAG in order that they might be included in applicable atsea engagements. In support of this objective, the SH-60B (SEAHAWK) Anti-Submarine Warfare Helicopter, which is currently not supported by NAVTAG, is incorporated into the NAVTAG system. The SH-60B is incorporated into the NAVTAG System with the full range of functions that are enjoyed by other aircraft modeled in NAVTAG. Using NAVTAG the SH-60B is tested in an AntiSubmarine Warfare (ASW) scenario developed to test its capabilities against a Soviet submarine. For comparison and testing purposes the SH-60B is also compared to the SH-2F helicopter previously modeled in NAVTAG. Both helicopters have comparable mission objectives and tactics. This is a research project to determine if NAVTAG can be modified in a research environment and with what degree of difficulty this may be accomplished. This in no way is meant to modify the Standard NAVTAG Systems that have been distributed to fleet units without the consent of the Program Manager. Originator supplied keywords include: Wargaming, NAVTAG, SH-60B helicopter.

NPS/DKL Location: THESIS G5725


Abstract: The expertise required by Tactical Action Officers in a modern Anti-Submarine warfare environment of complex weaponry, minimal reaction time and arduous conditions at sea necessitate training and experience that is both exhaustive and progressive. For these officers to be effective in making accurate and timely decisions so as to effect the most appropriate responses, they must have ready access to current tactical doctrine and system performance statistics. In time of war there is no time to allow a junior Tactical Action Officer to progress to a level of competency: he must be a reliable,
capable, fully functional warfare team member at the outset of his tour. This thesis presents a prototype Artificial Intelligence model of the TAO ASW decision making process using an expert system development tool run on a microcomputer, to train fledgling TAO's with an outlook to the potential development and capability of an operational expert system. (Author)

NPS/DKL Location: THESIS G585

Abstract: Five synoptic space sections along 158W longitude between Hawaii and the Aleutian Islands were developed from data collected by airborne expendable bathythermographs during experiment PARKA, a research project sponsored by the U. S. Navy in 1968. The sections are examined for spatial and temporal variation in thermal structure and geostrophic surface velocity. Two recently developed analysis techniques are employed. Denner's T-S gradient method, wherein thermal and haline contributions to total geostrophic velocity are distinguishable, expedites calculations and results in velocity fields comparable to those developed by the dynamic method. Thermocline parameters are developed using Boston's objective definition of the thermocline, a statistical curve-fitting technique which develops the notion of a Gaussian thermocline. Gross features of thermal structure remain fairly consistent during the heating season; however, thermal fronts are observed to vary in time and space. The distribution of isothermal lines with latitude suggests the possibility of a Taylor-column effect slightly north of Hawaii. (Author)

NPS/DKL Location: THESIS G618

Abstract: The ability to locate and determine the position of an ASW sonobuoy is an essential part of airborne anti-submarine operations. Present methods restrict the parent aircraft's operational capability and yield only marginal data. State-of-the-art frequency control makes it possible to range sonobuoys accurately with radio signals. Sonobuoy position can then be determined by combining this range data with other available information. A system is proposed to both free the parent aircraft from present restrictions and to increase the accuracy of the position information. (Author)

NPS/DKL Location: THESIS G6578

Abstract: A model presented in this thesis is a computer simulation model of ASW interactions between a formation of high value group ships, protected by some screening ships, and some penetrating submarines. The model is designed for use as an aid in improving the ability of a proposed screening tactic in the detection of a penetrating submarine. A systematic procedure to improve a screen's effectiveness against a known submarine threat is demonstrated, and an example problem is worked using this procedure. (Author)

NPS/DKL Location: THESIS G768

Abstract: As part of the development of the capabilities of the Command, Control and Communications (C3) Laboratory at the Naval Postgraduate School, there was a need for an in-house computer assisted tactical war game. The objective of this thesis was to satisfy that need. An anti-submarine warfare board game, 'Up Scope', which was designed, developed and produced by Simulations Productions, Inc. of New York, was used as the model. This thesis provides an interactive computer assisted anti-submarine warfare war game called 'Up Scope' which is written in FORTRAN. This thesis also develops a framework for any future computer adaptation of a tactical board game, details a player's manual and gives full documentation of the computer programming. Program listings, a sample game and several tactical scenarios are also included. (Author)


Abstract: In June 1987 the Canadian government announced plans to procure 10 to 12 nuclear attack submarines (SSNs). The evidence suggests that, for some Canadians, a primary purpose for this submarine program may not be to enhance the security of NATO, but instead to assert Canada's sovereignty, principally against the United States, in the Arctic region. The thesis discusses this decision and its possible implications for the security of North America and NATO. It is argued that the United States must continue to have unimpeded access to the Arctic region to counter the ever increasing threat posed by Soviet nuclear ballistic missile submarines (SSBNs). Finally the thesis suggests a possible solution to the current sovereignty debate and a potential strategy for employing these SNN to enhance the security of North America and NATO as a whole.


Abstract: The thesis discusses the solution of concave-convex games. An algorithm is developed, a computer program written and applied to an anti-submarine warfare force allocation problem as an illustration. Techniques for handling concave-convex problems in high dimensions are included. (Author)


Abstract: The helicopter contact area search problem is studied. The analysis used to derive current search plans is presented, and an error in this analysis is demonstrated. As a result of this examination a new model is constructed for investigating the problem. Game theory techniques are applied to the model and the methodology required to derive optimal strategies is illustrated. Although no complete optimal strategies are derived, it is possible to derive such strategies by applying computer techniques to the results of this study. Such strategies could then be applied in the fleet.

NPS/DKL Location: THESIS G8647

**Thesis (M.S. in Operations Research)–Naval Postgraduate School, 1964.**

**Abstract:** A procedural approach to the design and implementation of a computer simulation model is presented, with a simulation model description and computer code. The discussion and example are intended as reference material for the computer science and computer war gaming courses offered at the United States Naval Postgraduate School. The sample computer simulation was designed for the statistical analysis of the comparative effectiveness of different ASW helicopter search tactics in a variety of tactical and physical environments. This simulation has available a wide range of input parameters and is applicable to all ASW helicopters and any search plan employing ten helicopters or less. The accompanying FORTRAN computer code was written for the CDC 1604 computer, and is adaptable to the IBM 7090-94 by the inclusion of the appropriate control cards and random number generator. (Author)

NPS/DKL Location: **THEESIS H175**


**Thesis (M.S. in Systems Tech.)–Naval Postgraduate School, 1982.**

**Abstract:** The thesis explores the phenomena unique to echo-ranging with a source widely separated from the receiver. In an asset-austere era of antisubmarine warfare, this technique serves as a tactical advantage, particularly in the passive tracking of a submarine. Particular emphasis is placed on the terms of the sonar equation most affected by the bistatic geometry: Reverberation level and target strength. The research is particularly applicable to ongoing NATO and Naval Laboratory work involving the bistatic concept in array design and for use with surface escorts in conjunction with friendly submarines.

NPS/DKL Location: **THEESIS H296285**


**Thesis (M.S. in Oceanography)–Naval Postgraduate School, 1972.**

**Abstract:** An acoustic model for low frequency (100-2400 HZ) propagation loss within a surface duct is examined. An analysis of the sensitivity of this model as a function of the governing environmental parameters is performed. The results of this analysis show that the frequency and mixed layer depth are influential over a wide range of environmental conditions and that the below layer thermal gradient becomes important at low frequencies when the layer depth is relatively shallow. Under certain conditions, a change in below layer thermal gradient of 2F/100 FT has the same resultant effect as a 25 FT change in the mixed layer depth. (Author Modified Abstract)

NPS/DKL Location: **THEESIS H29629**


**Thesis (M.S. in Operations Research)–Naval Postgraduate School, 1967.**

**Abstract:** In order to evaluate the relative effectiveness of different active non-directional sonobuoys, a computer war game is developed. One submarine, employing one evasion tactic, is opposed by one helicopter, using five prosecution tactics. The tactic of the helicopter prior to the initial detection of the submarine is seen to be critical, and this simulation aids in determining an optimum tactic. A cost-
effectiveness model to use data from this simulation is developed. An example, using hypothetical but realistic data, is presented to illustrate methods of determining the cost-effectiveness of each sonobuoy type when used with its optimum tactic. (Author)


Abstract: A simulation model for the open ocean submarine versus submarine search and detection problem is presented. The objective of the simulation is to estimate the probability with which a nuclear powered attack submarine will achieve sonar detection of a nuclear powered transiting submarine using a search plan based on external intelligence. A detailed description of the model and its use are included along with a typical analysis. (Author)


Abstract: The evaluation of a proposed submarine detection system by computer war gaming techniques is illustrated by a hypothetical example. A scenario is chosen, tactics and policies established, and the tactical simulation conducted. From the results of the simulation, minimum specifications for the system to attain a given level of effectiveness are drawn. Finally, a scale is made for comparison of this system with similar systems in terms of cost per day per mile of barrier. (Author)


Abstract: This thesis will focus on the sea-based legs of the American and Soviet triads, examining a series of confidence-building measures (CBMs) that may be considered during the Strategic Arms Reduction Talks (START) that are underway in Geneva. Some proponents have argued that these CBMs, if implemented, would strengthen each side’s belief in the invulnerability of nuclear-powered, ballistic missile launching submarines (SSBNs), thereby increasing strategic stability. These proposals seek to increase confidence in SSBN survivability by managing both the employment of anti-submarine warfare (ASW) forces and the development of technology that could be specifically directed against SSBNs. This thesis will consider the possible effects that five different CBMs could have on U.S. perceptions of SSBN survivability. These changes in perception will be measured against the costs that might be exacted in other areas (e.g., tactical anti-submarine warfare) by agreeing to the CBMs.


Abstract: NANCEE is a computer simulation program which uses convolution (or meeting) probabilities to determine which barrier type of sonobuoy pattern has the highest probability of detection for a
transiting nuclear submarine. The program assumes that the optimum barrier is a straight-line one, two, or three row sonobuoy pattern containing not more than 48 sonobuoys. The barrier is centered on the submarine’s expected line of transit, oriented perpendicular to the submarine’s course, and placed far enough ahead of the submarine’s position that all pattern sonobuoys are in the water and being monitored before the submarine enters the detection range of the sonobuoy pattern. If more than one barrier is found to have the highest probability of detection, the one with the least number of sonobuoys is selected as optimum. (Modified author abstract)


Abstract: The development of new decision support systems for Antisubmarine warfare will entail the installation of propagation loss models on ASW aircraft. The decision to put either a range dependent or range independent model in the system will affect the predicted ranges, the overall probability of detection, and the computation time. Comparisons of the range dependent ASTRAL and range independent RAYMODE propagation loss models were made in the Eastern Mediterranean, the Gulf of Oman and the South China Sea for eight source/receiver/frequency combinations. Computation time differences between the two models were not significant at either of the source frequencies (50 Hz or 400 Hz). RAYMODE showed much better correlation with the split step PE model which was used as a standard. The ASTRAL model often predicted lower transmission losses than either RAYMODE or PE. For the short detection ranges normally encountered in air ASW the more complex range dependent models are not necessary. The RAYMODE model or a comparable range independent model will provide adequate propagation loss predictions. ASTRAL, RAYMODE, Propagation loss models.


Abstract: The contribution of a patrol squadron to the total ASW readiness is dependent in part upon the effectiveness with which allocated or assigned personnel are utilized. In the hope of increasing that effectiveness, organizationally induced problems encountered in the allocation and utilization of flight crew personnel were investigated. A possible solution is offered which involves minor organizational changes, establishment of a flight crew rate, and a functional application of manning level constraints.


Abstract: Many avenues have been explored to allow recognition of underwater objects by a sensing system on an Autonomous Underwater Vehicle (AUV). In particular, this research analyzes the precision with which a Tritech ST1000 high resolution imaging sonar system allows the extraction of linear features from its perceived environment. The linear extraction algorithm, as well as acceptance criteria for individual sonar returns are developed. Test results showing the actual sonar data and the sonar's perceived environment are presented. Additionally, position of the sonar relative to the perceived image is determined based on the identification of key points in the scene.

NPS/DKL Location: THESIS H534

NPS/DKL Location: THESIS H85365

NPS/DKL Location: THESIS H855

NPS/DKL Location: THESIS I4525

Abstract: An Implicit Finite-Difference (IFD) computer program that incorporates exact interface conditions has been developed for solving the parabolic equation. The model preserves continuity of pressure and continuity of the normal component of particle velocity at the interface between media having different sound speeds and densities. Interface conditions are preserved for horizontal and sloping interfaces along a user-specified bottom profile. Test cases are included to demonstrate the use of the model.

NPS/DKL Location: THESIS J2382


Abstract: The models for determining convergence zone Gain (G) were developed using a linearized Sound Speed Profile (SSP) and applying ray tracing theory. The SSP was divided into three cases; bilinear, bilinear with isospeed layer, and bilinear with mixed layer. Two analytical solutions were developed using Taylor series and binomial series expansions to determine G, one for the bilinear and bilinear with isospeed layer, and the other for the bilinear with a mixed layer. The solutions for G are exclusively a function of the SSP gradients. Each solution was compared to the solutions from ray tracing and the solutions from the Integrated Carrier Antisubmarine Warfare Prediction System (ICAPS) (which runs on mainframe computers and requires more data in addition to the SSP). When the SSP's were not too unusual, the solutions for G were fairly close when compared to ray tracing and ICAPS.

NPS/DKL Location: THESIS J452


Abstract: In a wedge shaped ocean, the method of images is used to develop an analytical approximation of the acoustic pressure field. Contemporary work develops acoustic doublets from a combination of the source and surface reflection image using simple dipole theory. The method of images is then used to sum the dipole images. This thesis matches dipole pairs to achieve a quadruplet expansion. A computer program using the derived quadruplet equation is then created to verify the results by comparing them with the URTEXT program. Method of images, Quadruplet expansion.

NPS/DKL Location: THESIS J8465


Abstract: A model based on Kitaigorodsky's application of similarity theory and modified by McDonnell to forecast the mixed-layer depth was studied. The model applies during the warming season and is based on the theory of similarity. The parameters involved in the model were determined from bathythermograph data recorded at Ocean Weather Stations November (latitude 30N, longitude 140W) and Bravo (latitude 56 30N, longitude 51W). Parameters were evaluated daily and grouped by months.
Both seasonal and transitional MLD situations were treated. From these parameters, the form of the dimensionless function $P(N)$, claimed by Kitaigorodsky to be universal, was determined by least squares fit to be best approximated by a second order polynomial. Forecasting equations involving $P(N)$ were developed for each month and tested with data from the following years for both OWS ships. There is general agreement between the observed MLD and that found from the prediction equation based on the last year's $P(N)$ for the same month and location. Month-to-month and spatial differences in $P(N)$ cast considerable doubt on its universality, at least as determined by the parameters as currently defined.

Thesis (M.S. in Computer Science)--Naval Postgraduate School, June 1990.  
Abstract: ARGOS is a multimedia database prototype system currently being developed by the Computer Science department of the Naval Postgraduate School in Monterey. Its primary purpose is to provide a prototype system that could be used as a Battle Group Commander's assessment tool and a shipboard data management tool, in addition to providing increased efficiency and productivity to the Navy ships. This implementation demonstrates the contribution such a system would make to the efforts of the Anti-submarine warfare (ASW) community.

Thesis (Master of Computer Science)--Naval Postgraduate School, Sept. 1994  
Abstract: The U.S. Navy's new multiprocessor, the AN/UYS-2 Enhanced Modular Signal Processor (EMSP) utilizes a First-Come-First-Serve (FCFS) algorithm to transfer data. This algorithm is simple to implement but provides no mechanism to control execution of a specific application on the AN/UYS-2 which prevents performance predictions. A Large Grain Data Flow (LGDF) representation of a specific application is utilized to predict performance, with the introduction of trigger queues (dependency arcs) into the graphs to control execution. I utilized the EMSP Common Operational Software (ECOS) Workstation to execute graph representations of specific applications used by the U.S. Navy in the Anti-Submarine Warfare (ASW) arena. A complete description of the ECOS workstation, and the process of transforming specific applications into graph representations to be executed on the ECOS Workstation is demonstrated. Specifically, the Correlator Graph which represents a real-time ASW process is examined. To control and improve performance, the technique of implementing trigger queues using the ECOS Workstation is demonstrated. A basic graph is executed and referenced as a benchmark, with two reconstructed graphs executed demonstrating how trigger queues effect graph execution. The node execution times statistics indicate trigger queues control execution and will provide a mechanism to predict node performance.

Abstract: The problem of allocation of ASW forces assigned to an oceanic convoy in a submarine warfare environment is postulated as a two-person game with the payoff function being based on the 'formula of random search.' The opponents in the game are a convoy system and a submarine system. A submarine is given the option of attacking the convoy system either from afar with surface-launched
missiles or near with torpedoes. The convoy system is defended by units capable of destroying submarines exercising either of their options. The optimal allocation of forces for both sides is shown to be a set of pure strategies which are dependent on the parameters of the model. (Author)

NPS/DKL Location: THESIS K399


Abstract: A basic approach to the problem of evaluating or predicting a crew’s performance for the VP community is presented. The method uses an application of multiple regression analysis techniques to a model which has training parameters as its variables. The results would allow the squadron or wing commanding officer to predict a crew’s performance before the actual flight and to determine how to allocate training time for the squadron. (Author)

NPS/DKL Location: THESIS K427


Abstract: This thesis examines a method to determine the depth of a point source in an isospeed ocean environment. Using the Fourier Transform on the acoustic pressure field in the range domain results in the attainment of the acoustic pressure spectrum in the wave-number domain and a characteristic nodal spacing unique to the source-receiver depths. Quantitative examination of a magnitude plot of the spectrum and use of simple mathematical formulae yield the source depth. The debilitating effects of narrowband noise and surface roughness on the pressure spectrum is recognizable in noise after the pressure field in the range domain has been lost in the noise field. The effect of surface gravity waves on the pressure spectrum is similar to that on the pressure field in the range domain: the characteristic nodal spacing is suppressed as the height of the surface waves increases. Keywords include: Lloyds mirror; Underwater acoustics; Fast fourier transform; Wavenumber technique; Pressure spectrum; Source depth determination; Acoustic propagation; Isospeed environment; Antisubmarine warfare. (Author)

NPS/DKL Location: THESIS K4492


Abstract: The Center for Naval Analyses Computer War Game, SEALIFT, is a Monte-Carlo simulation designed to help study sealift capabilities in an ASW environment. A mathematical model of the SEALIFT game is posited to obtain expected value results approximating those of the SEALIFT game. The model is cast in the Fortran terminology of SEALIFT and an effort is made to accurately reflect the SEALIFT flow chart logic in its development. Comparisons with SEALIFT results to determine the model's reliability and accuracy are not made. (Author)

NPS/DKL Location: THESIS K519

Abstract: A conceptual design of a stand-off weapon to be launched from maritime patrol aircraft for use against hostile surface combatants was performed at the request of the Naval Air Test Center. The purpose of this thesis was to study the feasibility of developing a low-cost, anti-ship missile for air ASW platforms. A mission threat analysis was conducted to determine the lethality of probable targets and to determine required missile performance characteristics. Current design methods and techniques were used to calculate the necessary missile geometry to meet the derived performance characteristics. An evaluation of navigation laws was conducted to determine the most appropriate flight profile for the missile. The control system was tailored to meet the specifications of the selected navigation law. An investigation of passive and active homing devices was conducted. A low cost seeker to adequately locate and track targets of interest was examined. A target engagement model was used to verify the missile’s maneuverability. This model demonstrated that the missile could intercept highly maneuvering craft when launched from a desirable stand-off distance.

NPS/DKL Location: THESIS K728


Abstract: This thesis describes and analyzes a possible deployment posture for the Soviet ballistic missile submarine force. It examines the proposition that the Soviet Navy will establish a point defense, labeled Close Aboard Bastions (CABs), for it ballistic missile submarine fleet within the Soviet claimed 12 nautical mile territorial sea. This is a logical derivation of the currently widely held view that the Soviet will establish a bastion defense for the strategic portion of their seagoing forces. The thesis concludes that the postulated CAB strategy is a viable option for the Soviet Union during a war that begins conventionally.

NPS/DKL Location: THESIS K85451


Abstract: This thesis researches the feasibility of a TDA (tactical decision aid) to defend a high value surface unit from an enemy submarine. Accordingly, this research adopts a FAB (forward and backward) algorithm to search for a moving target. It develops a prototype of a TDA: FABTDA which gives an optimal allocation for search aircraft.

NPS/DKL Location: THESIS K8786


Abstract: It is the purpose of this paper to develop a useful mathematical model of ASW aircraft availability. The increasing emphasis of systems studies dictates the use of accurate and representative models of the ASW systems. At present, many studies are using essentially the same models developed during World War II. This paper is an attempt to make use of advanced theory in a more powerful and flexible model and to make the use of the model practical and verifiable. The writer adapted the time homogeneous bivariate model as developed by F. C. Collins. This is a discrete time Markov process with a stochastic matrix of transition probabilities wherein the maintenance process is modeled as a pulsed input multiple server queue. The model was programmed in FORTRAN 63 on the CDC 1604 and then
modified to allow for variability in the input parameters. Other modifications include an increase in the size of the model to accommodate a 16-aircraft squadron, the largest ASW squadron at present, and an explicit form solution to the maintenance queueing equations. (Author)

NPS/DKL Location: THESIS L265


Abstract: Antisubmarine Warfare technology has made significant advances since World War II. However, this thesis is based on the assumption that training for ASW Surface Officers has not kept pace with this rapid technological growth. This thesis proposes that the career pattern for surface officers desiring in-depth ASW training be modified to improve this situation while allowing surface officers to maintain a viable career pattern in the Surface Warfare community. Such a career pattern seems to be feasible.

NPS/DKL Location: THESIS L27494


Abstract: This report summarizes the work on the evaluation, design, and reimplementation of part of the ASW System Eval Tool (ASSET), performed in the Computer Science Department, Naval Postgraduate School, under the sponsorship of the Antisubmarine Warfare Division (OP-71), Office of Chief of Naval Operations. We analyzed and implemented the improvements suggested in previous evaluations of various sub-areas of ASSET. In addition, we have designed and implemented a prototype user interface shell for ASSET on a Sun Sparcstation running X windows.

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-CS-92-015


Abstract: Despite the increasing emphasis by the military on joint force operations, existing modelling and simulation programs, including NPSNET, fail to address joint operations and crew coordination. The problem is that previous work on NPSNET, the virtual environment and visual simulation platform developed by the Computer Science Department at the Naval Postgraduate School in Monterey, California, has focused primarily on individual ground force elements with little emphasis on naval forces or crew concepts. This restricts the practical use of the system to ground force training while ignoring joint force training with sea and air components and between crew members. One solution is to expand the capability of NPSNET by incorporating a variety of vehicles from different components of the military with the added capability of multiple workstation control of a single vehicle. The approach taken is to expand NPSNET to simulate helicopter Anti-Submarine Warfare. This work focuses on realistic helicopter flight control, multiple workstation control of a single vehicle, and interface design between workstations controlling one vehicle. NPSNET has become a more useful training tool for today’s military forces by implementing more realistic helicopter flight controls and adding joint mission capabilities. The significance of this work is that a broad range of forces can receive valuable joint training and crew coordination training conducted in a virtual environment.

Electronic access: http://handle.dtic.mil/100.2/ADA304302

NPS/DKL Location: THESIS L525


Abstract: A searchlight type sonar is one of the systems that small navies use to counteract the danger which submarines present to their lines of supply and transport. In the paper, a standard search pattern for this type of sonar is compared with search patterns which are based on a consideration of the tactical value of detecting a submarine as a function of the relative location of the submarine. The results of the comparison suggest that it is possible to increase the effectiveness of a searchlight type sonar by using a search pattern in which the sweep time allocated to a search sector is based on the sector's tactical importance. (Author)

NPS/DKL Location: THESIS L757


Abstract: Military intelligence has considered various coastal scenarios in which the submarine is the only platform available to engage waterborne infiltration forces. Torpedoes are meant for large ships, and cruise missiles are strategic weapons not to be wasted on small craft. Therefore, the submarine does not have a weapons capability to engage and destroy high-speed marine craft (HSMC) that would be used for coastal penetration. The most practical scenario would utilize a torpedo stow for a weapon system that would be tube launched, thus ensuring the maximum cruise missile capability of the submarine with a minimal sacrifice to anti-surface and anti-submarine warfare capabilities. The maintaining of the submarine’s stealth will be paramount, therefore, an off-hull launcher is desired. The weapon needs to be highly discriminative due to high shipping traffic in coastal waters. In all, the major factors associated with the design and employment of a sub-launched weapon system for engaging HSMC are the threat, the missile, the launcher and the deployment method. In a hostile coastal environment, there are numerous targets ranging from surface threats to air threats. Missile design is dependent on the threat and can be varied for different scenarios. However, the launcher and deployment of a tube launched weapon system are only restricted by the dimensions of the torpedo tube and the buoyancy and stability of the designed system. These parameters can be quantified and modeled. This thesis focused on designing a weapon system, SEABAT, to meet the basic buoyancy and stability requirements. The results of the SEABAT design prove its feasibility as a torpedo tube launched weapon system.


Electronic access: [http://handle.dtic.mil/100.2/ADA374340](http://handle.dtic.mil/100.2/ADA374340)

NPS/DKL Location: THESIS L86675


Abstract: A simulation model was specified. It examines United States Navy Antisubmarine Warfare Screen alternative dispositions for Carrier Battlegroups. The scenario posed is open ocean transit under the threat of an attack from foreign submarine hulls built in the 1990's. The investigation raises the issue of the appropriateness of current Navy practices and suggests that new tactics be developed. The author's thoughts are that in the 1990's there will be ever newer, more lethal, unpredictable threats to United State's maritime independence than current doctrine addresses. The full implementation of the
simulation program has not been accomplished. A segment of verification output is shown for expository purposes only. A discussion is given on the adequacy of the model's abstractions along with their possible impact on potential results of experiments.

NPS/DKL Location: THESIS M35725


Abstract: The antisubmarine warfare (ASW) capability of the air arms of western navies depends upon their ability to employ air-dropable sonobuoys for the detection and localization of enemy submarines. The systems which process the acoustic information from these sonobuoys are sophisticated spectrum analyzers. A constant effort to improve performance has led to frequent updates to existing systems and the periodic development of completely new processors. Assessing the significance of these improvements in the operational environment is the function of an operational evaluation. The operational evaluation of an acoustic processing system is complicated by the impact of the constantly changing acoustic propagation conditions encountered in ocean operating areas. This, along with the inherent variability in the other factors affecting passive sonar performance, makes it difficult to compare the ranges achieved from one trial to the next. However, it is imperative that the evaluation agencies report findings that are applicable over the wide variety of operating conditions which are likely to be encountered in the operational employment of the airborne acoustic processor.

NPS/DKL Location: THESIS M1767


Abstract: The thermal structure of the ocean, especially the uppermost mixed layer, greatly affects sonar ranges. In this paper, similarity theory is applied to the problem of forecasting the depth of the mixed layer during the warm season, assuming the controlling processes are secular, non-adveective, and non divergent. The resulting forecast method consists mainly of two equations. Parameters used are wind, coriolis effect, the coefficient of thermal expansion and a measure of the excess heat within the mixed layer. The constants in the equations were determined using data from OWS Papa (50N, 145W). The forecast method treats both seasonal and transitional thermoclines. The method was tested with data from OWS Papa and OWS November (30N, 140W). The tests apparently indicate wide applicability of this forecast method and thus tend to corroborate the proposal by Kitaigorodsky that the mixed-layer depth is a function of a universal coefficient. (Author)

NPS/DKL Location: THESIS M1835


Abstract: A personnel and equipment design concept for a non-rigid, 100 hour endurance, Maritime Patrol Airship meeting Search and Rescue (SAR), Anti-Submarine Warfare (ASW), and Airborne Mine Countermeasures (AMCM) requirements was developed. The Maritime Patrol Airship could readily be equipped with off-the-shelf equipment. Minimal new design equipment requirements were identified. A baseline flight scenario and on station scenarios for: SAR, transoceanic ASW utilizing a passive towed
array sonar, and AMCM were developed. Human factors task analyses and a time line analysis were constructed from the scenarios. Manning reductions resulted for each scenario (3 crewmembers for SAR, 10 crewmembers for transoceanic ASW, 7 crewmembers for AMCM). Further research areas are identified. (Author)

NPS/DKL Location: THESIS M188335


Abstract: A general approach is documented as a guide to aid in the formulation and implementation of on-line, real time computer simulations. A computer program, MULNUC1, is developed as an on-line, real time computer simulation of antisubmarine warfare in a multiple burst nuclear environment. The principals of the game are a submarine armed with torpedoes, and two destroyers equipped with stand-off antisubmarine weapons. The simulation is intended as a demonstration of the on-line capabilities of the United States Naval Postgraduate School computer system and as a tool for further study of the factors involved in a representative ASW operational environment. (Author)

NPS/DKL Location: MICROFORM AD488327


Abstract: The Surface Warfare Development Group is responsible for conducting the Ship Anti-submarine Warfare Readiness/Effectiveness Measuring program. They currently employ a standard set of measures for evaluating the performance of shipboard anti-submarine warfare sensors. This research investigates several new performance-based measures to determine if they are more suitable than the standard measures for evaluating the conduct of anti-submarine warfare barrier searches. The investigation simulates barrier searches to determine probability of detection, calculates the proposed measures, and compares the two. The results indicate that the proposed measures can be improved. A barrier search algorithm exploiting target-relative space ideas is developed which generalizes the classical search theory results for predicting probability of detection during barrier search.

NPS/DKL Location: THESIS N24536

Electronic access: [http://handle.dtic.mil/100.2/ADA378067](http://handle.dtic.mil/100.2/ADA378067)


Abstract: This report contains 344 summaries of research projects which were carried out under funding of the Naval Postgraduate School Research Program. A list of recent publications is also included which consists of conference presentations, contributions to books, published papers, magazine articles, and technical reports. The research was conducted under the areas Administrative Sciences, Aeronautics and Astronautics, Computer Science, Electrical and Computer Engineering Mathematics, Mechanical Engineering, Meteorology, National Security Affairs, Oceanography, Operations Research, Physics, C3 Joint Academic Group, Electronic Warfare Academic Group, Anti-submarine Warfare Group, and Space Systems Academic Group.

NPS/DKL Location: MICROFORM ADA280616

Naval Postgraduate School.  **Compilation of Abstracts of Theses Submitted by Candidates for Degrees.** Monterey, CA: Naval Postgraduate School; Springfield, VA:
Abstract: This publication contains the abstracts of theses submitted during the period 1 October 1983 - 30 September 1984 by candidates for Doctoral, Master's and Engineer's degrees at the Naval Postgraduate School, Monterey, CA 93943. Subject areas include: Aeronautical engineering, Electrical engineering, Mechanical engineering, Applied science, Computer science, Engineering acoustics, Hydrography, Information systems, Management, Meteorology and oceanography, Operations research, Systems technology(antisubmarine warfare), Telecommunications systems management, and National security affairs.

NPS/DKL Location: REFERENCE Z5055.U39 U6 1983-84

Abstract: No abstract available.
NPS/DKL Location: MICROFORM ADA242938

Abstract: This report contains 330 summaries of research projects which were carried out under funding of the Naval Postgraduate School Research Program. A list of recent publications are also included which consist of conference presentations, contributions to books, published papers, and technical reports. The research was conducted under the areas of: Computer science, Mathematics, Administrative Sciences, Operations research, National security affairs, Physics, Electrical and computer engineering, Meteorology, Aeronautics and astronautics, Oceanography, and Mechanical engineering, Antisubmarine warfare, Space systems, Electronic warfare, and in Command control communications.
NPS/DKL Location: MICROFORM ADA236052

Abstract: This report contains 357 summaries of research projects which were carried out under funding of the Naval Postgraduate School Research Program. A list of recent publications are also included which consist of conference presentations, contributions to books, published papers, magazine articles, and technical reports. The research was conducted under the areas of: Computer science; Mathematics; Administrative sciences; Operations research; National security affairs; Physics; Electrical and computer engineering; Meteorology; Aeronautics and astronautics; Oceanography; Mechanical engineering, C3 Joint Group; Electrical Warfare Group; ASW Group; and the Space System Academic Group.
NPS/DKL Location: REFERENCE V422.M5 Z97 (FY1989)

Abstract: Determination an of an underwater target's position using passive acoustic sensors is of considerable use for the Navy, both for anti-submarine warfare (ASW) and underwater surveillance. This
thesis proposes and develops localization algorithms capable of passively determining the location of a transient source given some broad constraints. In particular, this thesis investigates the effect of the source signal uncertainty on localizer performance. The localization process consists of two parts. First, a time domain propagation modeling code determines the impulse response of the environment from all possible source locations to a single hydrophone. This program predicts the signal as it would appear at the receiver from a grid of possible source locations. Second, source localization results from finding the maximum correlation between the positionally dependent, numerically modeled signals and the actual received signal. The position of the maximum cross correlation reveals an estimate of source position. Using model to model correlation, this technique successfully localized acoustic sources in both Monterey Bay and Barents Sea scenarios.

NPS/DKL Location: THESIS N4873

Abstract: There are currently three databases supported by three different commands that collect and output basically the same type of information: PACER, SHAREM, and AIREM. These systems contain initial detection data, tracking data, environmental data, system performance data, and weapon performance data. This thesis investigates the commonalities and differences in structure and content of the three databases, and examines the feasibility of integrating PACER, SHAREM, and AIREM into a single database. The benefits of this database integration are a more comprehensive utilization of data, reduced data collection for fleet users, and a standardization of how the data is analyzed.
NPS/DKL Location: THESIS N5934

Abstract: In many strategic shallow water areas the geoacoustic properties of the sub-bottom are largely unknown. In this thesis it is demonstrated that inverse theory and measured data from a single hydrophone can be used to accurately deduce the geoacoustic properties of the sub-bottom, even when the initial background geoacoustic model is a highly inaccurate guess. Since propagation in shallow water is very sensitive to the geoacoustic properties of the sub-bottom, the inverse technique developed in this thesis presents the Navy with a vitally important, practical, and inexpensive means to improve sonar performance prediction in a potentially hostile environment. To provide ground truth for the inverse technique, measured data collected during Project GEMINI were compared to the inverse solutions. Detailed, site-specific geoacoustic models were developed for two array locations and the Finite Element Parabolic Equation (FEPE) model was used to estimate transmission loss (TL). The model estimates from FEPE compared well with the measured data and the detailed geoacoustic models were considered as ground truth. To test the efficacy of the technique, initial background geoacoustic models were constructed assuming no a priori information of the bottom. The resultant inverse solution was used to predict the geoacoustic properties at each of the sites. The final results were in excellent agreement with the measured data and the resulting inverse technique TL estimates were as good or better than the Th estimates obtained from the detailed, site-specific geoacoustic models.
NPS/DKL Location: THESIS N9485
Electronic access: http://handle.dtic.mil/100.2/ADA294674
Abstract: The primary interest concerns the use of a magnetometer for mine detection, anti-submarine warfare, salvaging and other related naval perations. The original concept of a modified free precession magnetometer using the Overhauser Effect was formulated by A. Abragam. The objective of this thesis was to develop an improved marginal oscillator for the magnetometer. (Author)
NPS/DKL Location: THESIS O248

Abstract: Unmanned vehicle technology has matured significantly over the last two decades. This is evidenced by its widespread use in industrial and military applications ranging from deep-ocean exploration to anti-submarine warfare. Indeed, the feasibility of short range, special-purpose vehicles (whether autonomous or remotely operated) is no longer in question. The research efforts have now begun to shift their focus on development of reliable, longer range, high-endurance and fully autonomous systems. One of the major underlying technologies required to realize this goal is Artificial Intelligence (AI). The latter offers great potential to endow vehicles with the intelligence needed for fully automated and extended range capability; this involves the increased application of AI techniques to support mission planning and execution, navigation and contingency planning. This thesis addresses two issues associated with the above goal for Autonomous Underwater Vehicles (AUV's). Firstly, a new approach is proposed for path planning in underwater environments that is capable of dealing with uncharted obstacles and which requires significantly less planning time and computer memory. Secondly, it explores the use of expert system technology in the planning of AUV missions. (KR)
NPS/DKL Location: THESIS O5825

Abstract: This thesis analyzes the problem of accurate path keeping for marine vehicles. The reference path is generated automatically through the use of a critically damped second order model. An appropriate shift in the time axis allows a smooth path with zero overshoot regardless of the initial conditions. Control design for the physical system is achieved through the use of optimum control and linear quadratic regulator techniques. Results are presented for general maneuvering scenarios in the horizontal plane and demonstrate the validity of the models used in the research.
NPS/DKL Location: THESIS P145755

Abstract: The thesis relates the fact that, in the past, our ASW community has placed great (and justifiable) emphasis in detection and classification of submarines, while a serious lag in tactical procedures has developed. In order to alleviate this problem, it was felt that a systematic approach be
taken which uses the principles of Operations Research. By examining submarine warfare from the viewpoint of the Soviet Union, a resource allocation problem was devised which compares the various submarine classes and the possible mission areas in which they may be assigned. Characteristics and available numbers of submarines were estimated, and the resulting allocation of forces was determined. (Modified author abstract)

NPS/DKL Location: THESIS P319


Abstract: This thesis contains an analysis of the last five years of Antisubmarine Warfare (ASW) Weapon System Accuracy Trial (WSAT) data from both the Atlantic and Pacific Fleet. The analysis is conducted in an effort to provide recommendations to be applied toward future evolution of the ASW Test Program for surface ships. A statistical chi-square test is conducted on Fleet and Navy wide data to determine which ASW combat system material categories are most prone to degradation. Additionally, a critical examination of the existing WSAT data base is provided with an aim toward promoting future statistical analysis. Results of this thesis indicate that degradation to weapons delivery systems like torpedo tubes and ASROC launchers are statistically significant with respect to other material categories. The analysis also shows how the existing WSAT data base can easily be modified and adapted for further use to document inspections on existing ships as well as new construction ships with future material systems.

NPS/DKL Location: THESIS P4654


Abstract: Vertical temperature profiles observed in the eastern North Pacific were used to examine the feasibility of extrapolating an observation from one location to another. The technique, referred to as simple enhancement, is a special case of the Gandin (1963) optimum interpolation methodology. Application to Navy ASW (Antisubmarine Warfare) operations is considered. The technique requires the use of a trial value and a local observation. Trial values are obtained from a climatology and a synoptic analysis/forecast system provided by the Fleet Numerical Oceanography Center. An enhanced temperature profile is calculated by adding an observed anomaly (i.e., observation minus trial value) to the trial value at the desired location. Calculations of mean and RMS errors indicate that simple enhancement can provide a closer estimate to actual conditions than unenhanced climatology. The mixed layer depth cannot be extrapolated accurately to new locations presumably due to mesoscale eddies, fronts, internal waves and small scale fluctuations at the base of the mixed layer. Experiments at different locations and seasons would be required for a complete assessment of the application to ASW operations.

NPS/DKL Location: THESIS P686


Abstract: This thesis develops, implements and tests a Tactical Decision Aid for a Reactive Target ASW Active Search. The mode uses a Bayesian Filtering Process to fuse information from a real world search conducted by several assets with information from a Monte Carlo Simulation that encompasses five
hundred equally likely different possible initial positions and behaviors of the real target. A Reactive Target Model resembles the behavior of a target that is always aware and reacts because of the presence and activity of the searchers. An initial 'prior', or best estimate of the location of the target is updated using the movement of the simulated targets, the negative information conveyed in an unsuccessful search over a period of time and the positive information implied in a contact report. The search effort is measured using a Fixed Scan Stochastic Model that solves the Sonar Equation limited by noise and reverberation. As a result of updating the prior, a 'posterior' distribution is obtained. The Law of Total Probabilities is used to render a probability map of the location of the Target by mapping color intensities to probabilities. A recursive expression for evaluating a contact report is also developed.

Electronic access: http://handle.dtic.mil/100.2/ADA322381

NPS/DKL Location: THESIS R2576


Abstract: Statistical analysis provides a powerful tool for modern decision makers. Unfortunately, this tool can be a two-edged sword. Improper or erroneous analysis can result in incorrect and costly decisions. Many analysis errors can be traced to the misapplication of statistical methods. When examining experimental data, it is first necessary to determine the true nature of that data, specifically, the structure from which the data is drawn. This determination will then be a primary factor in the choice of statistical tests. This thesis examines an analysis performed by Surface Warfare Development Group (SWDG). The SWDG analysis is shown to be incorrect due to the misapplication of testing methods. A corrected analysis is presented and recommendations suggested for changes to the testing procedures used by SWDG. Additionally, a computer program to perform basic Analysis of Variance (ANOVA) tests is provided to be appended to the current SWDG statistical software.

NPS/DKL Location: THESIS R4516


Abstract: False Sonar targets present a serious unpredicted problem to U. S. Navy ASW units. It is believed that planning and operations could be enhanced by a forecasting capability for whale distribution. As a possible solution to this problem, a modified form of the "Transect Method of population estimation" is applied to whaling data to calculate probable numbers of false targets per 1000 nautical miles of steaming with a 1000 yard sonar range. Japanese and Russian whale fishery data are analyzed by the 'q' and Expected Catch methods of population dynamics to obtain two independent estimates of the populations of fin, sei and sperm whales. The mean of the two estimates is applied to the equation along with a term for assumed ideal sonar conditions. (Author)

NPS/DKL Location: THESIS R557


Abstract: This thesis represents a study of the decision-making process of an Anti-submarine Warfare Commander (ASWC). Several real world operational issues are analyzed and discussed as to how they can influence his thought process when making decisions. One approach to model this individual's thought process was accomplished by ALPHATECH, INC. By utilizing an ASW scenario, it evaluates how
an ASWC makes his tactical decisions to track submarines based upon pieces of received acoustical information. In order to improve this model's representation of a realistic operational environment, a conceptual ASWC decision-making model is provided here.

NPS/DKL Location: THESIS R5912

Abstract: This study examines the advantages and disadvantages associated with the consolidation of the Helicopter Antisubmarine (HS) and Helicopter Anti-submarine (Light) (HSL) communities. The primary source material is generated from personal interviews of the Commanding Officers of these communities. The helicopter and mission developments of each community are researched to determine the goals, environments and technology that shape the squadron operational structures. The operational design of the current squadrons are then examined to see how they are structured to respond to these organizational constraints. This paper analyzes both sides of the consolidation issue and proposes four combined community organizations. Additionally, the advantages and disadvantages of each new structure are reviewed to make recommendations on consolidating the HS and HSL communities. This study also recommends a Project Action Team be formed to continue analyzing the consolidation of these communities and outline the steps required to implement a consolidation plan. Anti-submarine Warfare(ASW), Fleet Replacement Squadron(FRS), Helicopter Anti-submarine(HS) Helicopter Anti-Submarines(Light)(HSL).

NPS/DKL Location: THESIS R68947

Abstract: The study presents the results of an experiment in objective analysis of oceanographic data for a limited area. The objective analysis is designed to provide a reliable operational system for tactical use in coastal waters. It is shown that this approach makes it possible to obtain a very detailed analysis with good vertical consistency and that only a relatively small amount of highly accurate data is required. The procedure requires only a small computer and little computer time. This method will provide a basis for short-time forecasts of oceanographic parameters using only small computer centers or even time sharing systems.

NPS/DKL Location: THESIS S1579

Abstract: The purpose of this study is to discover if the Navy's system of assigning personnel to the Aviation antisubmarine Warfare Technician (AX) and the Aviation Antisubmarine Warfare Operator (AW) ratings can be improved. A multivariable model is developed using success and failure as criterion variables. Biographical and aptitude data available at the time of enlistment are used as predictor variables. Two independent models were created using data available on personnel entering the Navy in 1976, 1977 and 1978. The models were then validated on a new sample. These models predict the future fleet performance of AX and AW personnel as measured by length of service, paygrade achieved, and
recommendation for reenlistment. Other results and recommendations regarding implementation and future research are discussed. (Author)

NPS/DKL Location: THESIS S15796

Abstract: A discrete-time discrete-space search model is considered in which an observer employing an idealized detection device is searching for a uniformly distributed stationary target. The model is formulated as a discrete-time counting process, called the search process, which under weak additional conditions is uniquely determined by a sequence of probabilities. Formulas for the time-to-detection and the detection rate of a search are derived in terms of the parameters of the search process, and are applied to two special types of searches, the systematic search and the random search. Using these search types as boundary cases a purposeful search is defined, and sufficient conditions on the sequence of probabilities are established for the purposeful search. Possible extensions of the search process to less restricted models are indicated. (Author)
NPS/DKL Location: THESIS S214

Abstract: The United States Navy uses a number of different systems to predict underwater acoustic transmission loss for operational forces. Historically, these systems have used different acoustic models and supporting databases, resulting in significantly different predictions. Major efforts to bring all acoustic models and databases under configuration control in the Oceanographic and Atmospheric Master Library (OAML) have reduced, but not eliminated, differences in acoustic predictions. Comparisons of 1600 transmission loss runs from the AntiSubmarine Warfare Tactical Decision Aid (ASWTDA) and the Tactical Environmental Support System (TESS) were made in the Mediterranean and Sea of Japan for the months of January and July. All inputs to the acoustic models were provided by the respective system databases. Significant differences between ASWTDA and TESS in the areas investigated are evident in regions of complex bathymetry, and these differences become more acute with higher frequency.... TESS, ASWTDA, RAYMODE, ASTRAL, PE, Transmission Loss.
NPS/DKL Location: THESIS S2207

Abstract: The Computer Science Department at Naval Postgraduate School in Monterey, California has developed a low-cost battlespace simulation system, known as NPSNET, to work on commercially available Silicon Graphics IRIS workstations. Initial work on NPSNET has concentrated primarily on ground-based forces with only limited work focusing on naval or maritime air forces. With the present movement of the military towards totally integrated joint force operations, there exists a need to expand existing modeling and simulation programs to include all aspects of military operations. This thesis takes a step in that direction by incorporating naval maritime air units into NPSNET, expanding its capability to include naval and Antisubmarine Warfare (ASW) units. This work focuses on several areas of research, including modeling of the P-3 aircraft, aircraft motion control, aircraft ordnance ballistics modeling,
interstation networking using the Distributed Interactive Simulation (DIS) protocol and development of an expert system to autonomously control aircraft behavior. Graphics, P-3, Expert systems, Torpedo ballistics, Sonobuoy ballistics, CLIPS.


Abstract: The study concludes that the primary reason for present programs of enlisted training and education in oceanography is to support ASW. There is a significant lack of courses, schools, and self-study material available to enlisted personnel on the subject of oceanography. Through more than the surface ASW community in the ability to utilize ASW, ASW sonar technicians are inadequately trained in environmental effects on underwater sound propagation. To increase the oceanography knowledge of all enlisted personnel including STs and to provide enlisted ratings to better utilize training in environmental effects, several programs are proposed. These programs include an ASW sensor rating and an oceanographer rating. (Author)


Abstract: The author develops some two-person zero-sum formulations of search and evasion problems. By employing a game theoretic approach, he allows the hider, as well as the searcher, to choose a strategy. This is in contrast to most search models which assume a stationary or passive hider. Both non-sequential and sequential search games are investigated. Some interesting aspects of the non-sequential game and an example of an antisubmarine search problem are given. The sequential games consist of a sequence of moves. When the players move, they not only determine a payoff but also the probability that the game terminates before the next move. When at most a finite number of moves is allowed, he proves that a solution may be found by solving a recursive sequence of matrix games. When the number of moves is not bounded, the game is characterized by a special type of non-linear program. The solution to this program can be approximated by successive perturbations of a related linear program. He obtains the result that a pair of strategies minimaxes the expected duration of the game if and only if these strategies also maximin the probability of termination in one step.


Abstract: The primary objective of this thesis is to analyze and recommend improvements to the Maritime Patrol Aircraft (MPA) detection and allocation models utilized by the ASW Systems Evaluation Tool (ASSET), version 1.0. ASSET is a generic high-level ASW modeling tool, designed to aid CNO (OP-71) in the development and refinement of ASW top-level warfare requirements and the ASW Master Plan. ASSET's strengths lie in its C3I modeling of submarine, MPA, and overhead surveillance in large scale ASW campaigns. To reduce the processing time required by ASSET, the current version of the MPA detection model contains simplifications which can limit its ability to effectively simulate some MPA tactical ASW scenarios. This thesis proposes two new MPA detection models which utilize the coverage area of a user-defined sonobuoy pattern and address the limitations of the current ASSET model. Also proposed is an MPA allocation scheme which should provide a higher cumulative detection probability.
Abstract: The Soviet Union's activity in the Caribbean Basin, executed via its client-states of Cuba and Nicaragua, has created a serious threat to U.S. security in the region. This threat to U.S. security takes two forms. The first is the reality of a heavily militarized Cuba posing a significant anti-SLOC potential against Caribbean sea lanes in the event of general war. Such a scenario would tie down NATO antisubmarine warfare (ASW) assets in the Caribbean, detracting from NATO's ability to wage the ASW campaign in more critical areas such as the Central and North Atlantic. The second threat is Nicaraguan and Cuban active support of leftist insurgencies in the Basin. These efforts, at the direction of the Soviet Union, pose, not a potential, but a present-day and ongoing security concern for the United States. This thesis briefly examines the historical context of Soviet involvement in the region, and then proceeds to catalog the above mentioned threats to U.S. security, and discusses their implications.

Abstract: This report provides a procedure for estimating a contact's course, speed and position based on bearings-only data from two moving sensors. This report also contains a program for the HP-67 /97 calculator to implement the procedure. (Author)

Abstract: A basic course with applications of probability to ASW, the course consists of six lesson plans and a 'Study Guide.' The lesson plans are designed to give the/an instructor guidance in what to teach, the depth required and objectives the student should be able to accomplish. The 'Study Guide' provided is for the use of both the instructor and the student, and it should serve as a basic text for the course. Current ASW tactical publications were examined by the authors while developing the course, and as many of the probability applications and as much associated probability terminology from these sources as practicable (and when this could be accomplished at the 'unclassified' level) are incorporated in the course.

Abstract: The thesis investigates the effectiveness of a search plan developed by B. O. Koopman in a submarine versus submarine search situation. Two computer simulation models allow probability of target
detection as a function of sonar range to be used as a measure of effectiveness. The Koopman search plan is analyzed and a family of alternate search plans are developed. The choice of a particular alternate search plan is dependent on the parameters of the problem. These parameters are target speed, searcher speed, time late to the search area and total time available to conduct the search. By use of the computer programs a search plan can be chosen so as to maximize the probability of target detection at a particular sonar range for each combination of input parameters. (Author)

NPS/DKL Location: THESIS S6054

Abstract: *In 1960 R. E. Kalman introduced a least square concept that gives optimal estimates for the state of some dynamic systems. Included is a brief historical introduction leading to his work, a summary of his work, and the application of the theory to the sonobuoy reference system used on the S3A aircraft. Also, a tutorial development of certain quantities used in the filter is presented. (Author)*

NPS/DKL Location: THESIS S6715

Abstract: *The thesis traces the history of the practice of and organization for operations research in the United States Navy. The author points out that operations research was being conducted in the U. S. Navy before operations research became identified as a separate science. From that point its growth, major accomplishments and organizational changes are described. The final part of the thesis outlines the organization through which the Navy conducts its operations research and systems analysis at the present. (Author)*

NPS/DKL Location: THESIS S767

Thesis (M.S. in Operations Research)--Naval Postgraduate School, 1975
Abstract: *The effects of detection equipment integration time on the optimal evasive trajectory of an isotropic acoustic radiator are studied. The boundary cases of infinite and zero integration time are examined. The infinite integration time case is formulated as a control problem and a maximum principle solution is obtained. The results consist of advice as to the choice of control vectors. The zero integration time problem is formulated in ordinary differential equations and the results consist of control vector advice. The relative movement plots and control vectors of the two bounding cases are compared.*

NPS/DKL Location: THESIS S85715

Abstract: *A FORTRAN IV computer program was employed to conduct a statistical analysis of data collected during fleet antisubmarine warfare exercises. The object of the investigation was the*
identification of those variables which had greatest influence on a destroyer’s ability to detect a submarine under certain conditions. The variables were treated as a random vector arising from one of two multivariate normal populations with common covariance matrix. An artificial regression relation was formulated to facilitate development of a linear discriminant function in a subset of those variables found to be of dominant importance. This latter subset was identified by examination of multiple correlation coefficients. The discriminant function was found to be seventy five per cent effective in classifying the experimental data correctly. (Author)

NPS/DKL Location: THESIS S8584


Abstract: The Naval Postgraduate School must, by default, make use of teaching cases in information technology case studies oriented or based upon corporations. It has been difficult for the school to obtain such studies oriented to the military, much less the United States Navy. This thesis provides the Naval Postgraduate School with three teaching cases concerning automated information systems serving the administrative and operational needs of unit-level command organizations.

NPS/DKL Location: THESIS T3634


Abstract: This research was aimed at improving the genetic algorithm used in an earlier anti-submarine warfare simulator. The problem with the earlier work was that it focused on the development of the environmental model, and did not optimize the genetic algorithm which drives the submarine. The improvements to the algorithm centered on finding the optimal combination of mutation rate, inversion rate, crossover rate, number of generations per turn, population size, and grading criteria. The earlier simulator, which was written in FORTRAN-77, was recoded in Ada. The genetic algorithm was tested by the execution of several thousand runs of the simulation, varying the parameters to determine the optimal solution. Once the best combination was found, it was further tested by having officers with anti-submarine warfare experience run the simulation in various scenarios to test its performance. The optimum parameters were found to be: population size of eight, five generations per turn, mutation rate of 0.001, inversion rate of 0.25, crossover rate of 0.65, grading criteria of sum of the fitness values of all alleles while building the strings, and checking the performance against the last five environments for the final string selection. The use of these parameters provided for the best overall performance of the submarine in a variety of tactical situations. The submarine was able to close the target and execute an attack in 73.1% of the two hundred tests of the final configuration of the genetic algorithm.

NPS/DKL Location: THESIS T496


Abstract: The goal of this thesis is to investigate the initial search planning phase of the Search and Localization Tactical Decision Aid (SALT) developed by METRON, Incorporated of McLean, VA. SALT is a Computer Assisted Search (CAS) program intended for use by P3 UPDATE IV crews to assist them in optimal deployment of a sonobuoy field to prosecute a submarine threat. The initial search planning phase of SALT takes as user inputs environmental data, an initial elliptical Search Probability Area, an assumed target motion model, and the duration of the search. Outputs include a recommended sonobuoy
pattern and the probability of detection of this pattern. The investigation of this phase of the algorithm is conducted in two parts. First, a series of simulation routines is used to ensure that the probability of detection of the sonobuoy patterns generated by SALT is mathematically correct. Second, these same computerized simulation routines are used to determine if there are alternate sonobuoy patterns that result in higher probabilities of detection.

Tobin, Albert A.  

**Thesis (M.S. in System Tech.)--Naval Postgraduate School, 1984.**

**Abstract:** This user’s guide examines the passive sonar model used by the Naval Warfare Interactive Simulation System (NWISS). The processes by which passive sonar detections are made are discussed. The thesis includes an explanation of how to affect those processes in order to control the interaction and results of an NWISS ASW scenario. A method for determining a sonar system’s figure of merit and estimating ranges of detection is presented for the benefit of the operator who prepares the scenario, as well as for the user. This method is primarily intended for use with NWISS in its tactical training role.

Traganza, Eugene Dewees.  

**Technical report, period July to September 1978.**

**Abstract:** The purpose of this report is to briefly update the state of the art of detection of ocean fronts and eddies by satellite sensed sea surface temperature and to consider oceanographic color characteristics which may be used to detect their presence when the sea surface temperature pattern is absent.

Trelles Sánchez, Jorge.  

**Thesis (M.S. in Engineering Acoustics) Naval Postgraduate School, 1976.**

**Abstract:** A theory is presented for computing the far field beam patterns from distributed random noise sources. The theoretical model uses the Green’s Function for the wave equation and the space-time autocorrelation function for determining the radiation from a randomly vibrating area. The actual far field beam pattern of a horn speaker in an anechoic chamber was obtained, and also near field measurements were taken to obtain the correlation distance and the mean square of the particle velocity using the autocorrelation function. Finally a computer program was written to evaluate the integral wave equation by numerical methods. It was found that the critical parameters in the mathematical model were the correlation distance and the frequency limits of integration. Small variations in the correlation distance modified greatly the width of the predicted beam pattern, while changes in the limits of integration had a moderate effect. The Frequency Spectrum was obtained in the anechoic chamber and it was used to determine the limits of integration of the integral solution for the intensity field.
Abstract: Analysis of three major areas for naval arms control proposals: restrictions on strategic antisubmarine warfare, naval operations, and strategic antisubmarine warfare technology. Author reviews the goals of arms control and finds none of these three areas in need of regulation. Author concludes with a number of innovative areas for naval arms control in areas of doctrine, strategy, operations, and exercises with concrete recommendations and acceptable (to USN) fallback positions. (SDW)
NPS/DKL Location: FEDDOCS D 208.14/2:NPS-56-89-015

Abstract: Author makes case that due to recent events, initiatives in areas of naval arms control are extremely poorly timed. These events include political changes in USSR, the changing international security environment, the new Soviet military doctrine and strategy, ongoing arms control negotiations, unarticulated U.S. and NATO goals, and changes in Soviet and U.S. planning assumptions and scenarios. Author then analyses three major areas for naval arms control proposals: (1) restrictions on strategic antisubmarine warfare, (2) naval operations, and (3) strategic antisubmarine warfare technology and fanks them on technical grounds. Author reviews the goals of arms control and finds none of these three areas in need of formal regulation. Author concludes with a number of innovative areas for naval arms control in areas of doctrine, strategy, operations, and exercises with concrete recommendations and acceptable (to USN) fallback positions. (Author) (kr)
NPS/DKL Location: FEDDOCS D 208.14/2:NPS-56-90-012

Abstract: This document examines the role of strategic missile carrying submarines in deterrence and mission of attacking these forces during the conventional phase of a war. Strategies considered include wars originating in varying regions. Included is a discussion of varying locations for submarine deployments impacting on potential Antisubmarine Warfare campaign. Escalation considerations include vertical, horizontal, and time. It concludes with analysis of possible arms control regulations. (KR)
NPS/DKL Location: FEDDOCS D 208.14/2:NPS-56-88-013

Abstract: This report examines the role of strategic missile carrying submarines in deterrence and the mission of attacking these forces during the conventional phase of a war. It includes discussion of varying locations for submarine deployments impacting on potential antisubmarine warfare campaigns, and also analyzes possible arms control regulation of ASW.
NPS/DKL Location: FEDDOCS D 208.14/2:NPS-56-88-004

Abstract: The computer war game is emerging as a vital tool for finding near-optimal solutions to current military problems. A computer war game designed to permit parametric analysis of a submarine barrier is developed. Simulation techniques both mathematical and computer, are discussed. The effects of assumptions inherent in the computer war game are described. Illustrative analyses conducted through use of this computer war game are exhibited. Potential uses and methods for improvement of the developed war game are discussed. (Author)

NPS/DKL Location: THESIS V32

Abstract: The role of the Maneuvering Target Statistical Tracker (MTST), a Kalman filter tracking algorithm based on the Integrated Ornstein-Uhlenbeck (IOU) motion process, in the Antisubmarine Warfare System Evaluation Tool (ASSET) is examined and its operation described. ASSET is a campaign simulation which models open-ocean ASW scenarios featuring prosecution of hostile submarines by friendly submarines and aircraft based on cues provided by data fusion centers. The heart of each data fusion center is an MTST which integrates new contact information into tracks. Comparing the level of sophistication of the tracking algorithm to that of the contact data provided to it, a number of simplifications are proposed. These include using reduced complexity IOU prediction and Kalman filter equations; the use of preprocessed variance data together with the true position of targets to estimate, rather than explicitly calculate, updated track states; and limiting contact processing based on information content. Results indicate a good simulation of tracker output is produced using a greatly simplified algorithm. This technique can be generalized to other types of simulations involving target tracking.

NPS/DKL Location: THESIS V3615

Abstract: No abstract available.
NPS/DKL Location: THESIS V417

Abstract: A computer war game is developed to measure the effect of false contacts on the probability of detecting a submarine. The variables are the probability of correctly classifying a non-submarine contact, the probability of correctly classifying a submarine contact, and the false contact density. A scenario is developed to focus on the false contact problem while holding other ASW variables constant. It is concluded from the output of the game that the effect of false contacts is deeply embedded in the interrelationships between units. (Author)
NPS/DKL Location: THESIS W22284

Abstract: Theater Ballistic Missile launching systems are vulnerable just after a missile is launched because the missile’s track can be extrapolated backwards to the location of the launcher. The situation is similar to one where a submarine torpedoes a ship, thus creating a flaming datum near which ASW forces may concentrate a search for the submarine. This report describes how some simple analytic methods adapted from ASW can be applied to the task of locating the TBM launcher. TBM, Scud, Search.

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-OR-93-015

Abstract: The study into the knowledge and experience required for optimum performance by officers assigned to operational, R+D, and managerial duties in Anti-submarine Warfare concludes that oceanography should receive the major emphasis in an interdisciplinary graduate level program of the contributing disciplines in ASW. In planning education and training for officers in ASW and other oceanography-related duties the total Service experience should be considered. Oceanography graduate curricula are recommended which will provide knowledge for developing careers of three categories of officers who respectively will: ‘specialize’ in ASW; become special duty ‘environmentalists’; and serve in technical management assignments. Billets are identified for each of these categories. (Author)

NPS/DKL Location: THESIS W22997

Abstract: This thesis provides a preliminary software design for an Antisubmarine Warfare Tactical Flight Simulator. The simulation uses AN/ASN-123 Tactical Navigation Set (TACNAV) display symbology and selectable graphic functions to track and localize a single fully-evasive submarine. The primary design objectives are flexibility, utility, and understandability. A composite design methodology including levels of abstraction, information hiding, coupling, and cohesion as modularization criteria is used to effect a top-down modular decomposition of the simulation. A hierarchical structure is developed and modular packaging is discussed. Some aspects of physical implementation are also discussed and appropriate recommendations made. (Author)

NPS/DKL Location: THESIS W48429

Abstract: Utilization of neural network techniques to recognize and classify acoustic signals has long been pursued and shows great promise as a robust application of neural network technology. Traditional techniques have proven effective but in some cases are quite computationally intensive, as the sampling rates necessary to capture the transient result in large input vectors and thus large neural networks. This thesis presents an alternative transient classification scheme which considerably reduces neural network size and thus computation time. Parameterization of the acoustic transient to a set of distinct characteristics (e.g. frequency, power spectral density) which capture the structure of the input signal is the key to this new approach. Testing methods and results are presented on networks for which computation time is a fraction of the necessary with traditional methods, yet classification reliability is maintained. Neural network acoustic classification systems utilizing the above techniques are compared
to classic time domain classification networks. Last, a case study is presented which looks at these techniques applied to the acoustic intercept problem.

NPS/DKL Location: THESIS W5725


Abstract: This thesis analyzes the environmental compatibility and the potential performance capabilities of two proposed types of vertical flight capable aircraft in an aircraft carrier Anti-Submarine role. The aircraft compared are the CV Helicopter(SH-60F) and an ASW variant of the Joint Services Advanced Vertical Lift (JVX) tilt-rotor aircraft. This thesis compares their adaptability and relative expected mission effectiveness by analyzing their physical dimensions and characteristics and their projected flight performance parameters. Their expected performance in a specific scenario, an ASW pouncer mission employing active dipping sonar, is analyzed using a simulation model. Keywords: Time On-Station; Search and rescue; Flight deck; Detection probability; Helicopter in-flight refueling; Tilt-rotor; and Dipping sonar.

NPS/DKL Location: THESIS W58526


Abstract: Japan's economy, the third largest in the world, is totally dependent on the sea lines of communication for the importation of 90 percent of its energy requirements and strategic metals and for over 70 percent of its food. Despite the importance of the sealanes to Japanese security, the Japanese Maritime Self Defense Force (JMSDF) remains incapable of protecting those sealanes against interdiction. Although the JMSDF is currently the seventh largest navy in the world, future expansion has been stymied by Japan's steadfast refusal to increase defense spending above one percent of the GNP. Long-range procurement plans focus on qualitative improvements with a primary emphasis on anti-submarine warfare, a strategy which could foreshadow a building program to enable the JMSDF to control the vital sea lanes. On the other hand, political and domestic constraints on a strong military indicate a continuing reliance on the United States for Japan's security. This study examines the factors affecting military decision-making in Japan, looks into the problems and realities of sealane defense and analyzes the future prospects for the JMSDF. (Author)

NPS/DKL Location: THESIS W5877


Abstract: This report describes how the philosophy that influenced Anti-Submarine Warfare operations can be used to guide counterforce attacks against mobile missiles. It explains why an ASW approach to counterforce is superior to just attacking an opponent's missile infrastructure. It also explains why this type of counterforce strategy can be based on preemption not preventive war. The impact of ASW counterforce operations are also evaluated in terms of the stability-instability paradox, crisis stability, alliance relations and deterrence. TBM, Scud, Search, Crisis-stability, Counterforce, Alliances.

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-OR-94-007

Abstract: *An experimental investigation was made of the scattering properties of a bubble cloud in a sound field in a fresh water medium. The size of the bubbles was on the order of 0.125 cm radius, and was far above resonant size for the ensonifying sound field. It was determined that the bubbles scattered coherently in the forescatter direction, and incoherently in the backscatter direction. Based upon the scattering properties of the bubble cloud, it appears feasible to develop a device that could have tactical applications in the prosecution of long-range submarine contacts held by active sonars. Such a device would utilize the principle of resonant bubbles, and would require approximately 2.5 cubic feet of air (corrected to STP) to maintain a +20dB target strength for five minutes of continuous operation. (Author)*

NPS/DKL Location: THESIS W914
ANTISUBMARINE WARFARE (ASW) -- OTHER THESES & TECHNICAL REPORTS

Acker, David D.  
Abstract: *The objective of this study is to evaluate the Defense System Acquisition Review Council (DSARC) process since its inception and to assess, in a qualitative sense, the degree to which the process has proved to be effective and efficient. In contrast to earlier studies, this study focuses on both the process and the supporting procedures from the standpoint of the program by examining impacts on programs reviewed. The study focuses on two specific areas, the actual process; and the procedures. The process is defined as the basic concept of decentralized management with centralized control of key decisions. The procedures are defined as those activities required to support the process.*  
NPS/DKL Location: MICROFORM ADA129795  

Antipov, I. And J. Baldwinson.  
Abstract: *This report describes the design and implementation of a detection performance prediction model that has been developed for a generic Anti-Submarine Warfare mode of a maritime surveillance radar system. The model provides a map of the predicted average probabilities of detection as a function of range and look direction compared to the wind/swell direction for a user defined target in user defined operational and environmental conditions.*  
Electronic access: [http://handle.dtic.mil/100.2/ADA389153](http://handle.dtic.mil/100.2/ADA389153)  

Bermingham, William and Robert Wolfe.  
Abstract: *This report describes a protocol developed for the P-3C Modernization Program utilizing the MIL-STD-1553B Data Bus. The protocol described in this report is intended as a menu of tools to be utilized, as the interfacing requirements govern, by the I/O and applications programmers. The work formats specified are a layer below that of the application software except where specifically mentioned.*
This protocol is intended to satisfy all currently envisioned P-3C interfacing requirements which fall into the realm of the restrictions and capabilities imposed by MIL-STD-1553B.

NPS/DKL Location: MICROFORM ADA111679


Abstract: Emerging concepts for Anti-Submarine Warfare (ASW) and Rapid Environmental Assessment (REA) increasingly rely on communication technology in order to implement distributed information networks and to exchange information between naval units and military commands ashore. The necessary communication links could be accomplished using a variety of solutions: our main focus is on radio frequency (RF) links which offer easy deployment and flexible operations. This document illustrates how spread-spectrum techniques can be adopted to substitute and enhance existing communications systems to permit the deployment of distributed scalable networks of ships and sensors characterized by reliable performance (resistance to hostile jamming and environmental interference) and low probability of interception. An overview of real applications in ASW and REA is presented.

Electronic access: [http://handle.dtic.mil/100.2/ADA391919](http://handle.dtic.mil/100.2/ADA391919)


Abstract: The high order transfer functions representing the lateral directional responses to pilot control inputs were matched with low order equivalent forms in the frequency domain for five Navy tactical aircraft: the A-6, A-7, S-3, F-14, and F-18. The candidate low order equivalent forms investigated were: 1) the complete three degree of freedom representation of roll and sideslip angle responses, and 2) the single degree of freedom roll mode and Dutch roll approximations. Acceptable models were generally obtained for both forms. Simultaneous matching of sideslip and roll angle responses and/or apriori information for the roots was required to match the full three degree of freedom forms. The equivalent system models are discussed in terms of their match statistics. The equivalent system modal parameters, when compared against the requirements of the military flying qualities specification, demonstrate level 1 flying qualities for the conditions analyzed with the exception of roll angle time delay for the A-7 and F-18 airplanes. The A-7's lateral command augmentation structure results in Level 2-3 equivalent time delays, while the F-18's control force inputs produce Level 2 equivalent time delays. (Author)

NPS/DKL Location: MICROFORM ADA141672


English translation of Marine Rundschau (Germany, F.R.) n5 p. 252-255 May 82.


Abstract: Present high costs of nuclear attack submarines have led to reduced procurement rates and will lead to significantly reduced force levels in the 1990's. The paper examines the impact of these reduced levels in order to suggest possible steps to mitigate their severity. An analysis is first made of possible roles for submarines under a variety of wartime scenarios; submarine employment is determined to depend more on invariant Soviet naval missions than on the precise nature of a future war. The
interaction of U. S. submarine capabilities and Soviet Navy missions suggests the most important use of submarines is in anti-submarine warfare, both for sea control and for protection of carrier power projection forces. Dealing with the projected decrease in submarine force levels by reducing missions, improving effectiveness of existing forces and building more submarines are each examined; the examination suggests that no totally satisfactory solution exists given the probability of continued austere shipbuilding budgets. The analysis concludes that a mixed approach including procurement of less expensive (and less capable) nuclear submarines after 1985, extension of service life of some existing submarines, and various other steps is required to maintain submarine warfare capabilities. (Author)

NPS/DKL Location: MICROFORM ADA079599


Abstract: The purpose of the informal test, reported in this QSTR, was to analyze moral Defense System's interpretation and use of the CALS standards in transferring technical engineering data. Loral used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff using an electronic ftp transfer. The stated purpose of this test was to evaluate the data and not the CALS format.

Electronic access: http://handle.dtic.mil/100.2/ADA312310


Abstract: The Southern California Acoustic Range (SOAR) is designed to provide a 100 square mile Anti Submarine Warfare training range in 4000 feet of sea water west of San Clemente Island, California. SAR will provide accurate tracking of air, surface and submerged targets. This plan is a working document that details the mobilization, execution and demobilization of the underwater portion of the SOAR project. The overall scenario of the project is to accomplish the following: (a) Prefabrication and assemble project materials at NOSC, San Diego; (b) Conduct training near Coronado beach; (c) Mobilize the OCP SEACON and UCT-2 personnel and equipment at West Cove, San Clemente Island; (d) Land the SSL cable and deploy the SSL system at sea; (e) Land the WQC cable and deploy the WQC transducer at sea; (f) Conduct a complete as-built survey (g) Demobilize SEACON and return all equipments and (h) Prepare a detail completion report.

NPS/DKL Location: MICROFORM ADA168632


**Abstract:** This paper addresses the role of submarine warfare in today’s national strategy. Analysis of submarine coastal operations during the Pacific War, specifically during the final campaign to invade mainland Japan, provides insight into submarine littoral warfare today. Following the decline of the Soviet Union, U.S. forces have focused on the application of maneuver warfare against emerging regional threats. Undoubtedly, this means control of the littoral regions of the world, where joint forces, including submarines, can influence events ashore. Included within the text is a historical perspective and future vision of submarine littoral warfare as it relates to operational maneuver from the sea.

**Electronic access:** [http://handle.dtic.mil/100.2/ADA293706](http://handle.dtic.mil/100.2/ADA293706)

**Dobek, Gerald Joseph.** *System identification and application to undersea vehicles.* Tampa, FL: USF, 1976. 164 l.


NPS/DKL Location: GENERAL QA402 .D63


**Abstract:** Recently in force employment studies several high level campaign models have been developed. These models mainly describe the interactions between Soviet submarines and NATO reinforcement and resupply shipping. Values of input parameters are required, which could either be determined by submodelling or simply be given. The choice highly depends on the sensitivity of the results to these input parameters and to the available information for developing submodels. This memorandum describes submodels for two input parameters to higher models: the encounter rate between transitting NATO ships and a submarine on patrol, and the average time a submarine will spend inside the convoy defences when attempting to attack a convoy. (Author)

NPS/DKL Location: MICROFORM ADA095111


This article is from the Proceedings of the Flight Mechanics Panel Symposium Held in Lisbon, Portugal on 2-5 Apr 84, ADA147625, p. 14-1 - 14-13.

**Abstract:** The Nimrod MR Mk 2 represents a large step forward in antisubmarine warfare (ASW) technology. Therefore aircraft operators need to know not only how accurately the new systems and sensors work, but also the best ways in which to use the overall system as a fighting machine. A&AAE Boscombe Down and the RAF Central Tactics and Trials Organisation joined forces to assess the ASW performance of the Nimrod in as near an operational environment as possible. The paper shows how the potential accuracy of the Nimrod’s ASW system had to be matched by the precision of trials data collection, in the air and both on and below the sea surface. To gain such precision, the aircraft were extensively instrumented and the majority of the trials were conducted at the AUTEC Range in the Bahamas. The paper continues by explaining how the trials analysis technique had to match the variety of combinations of the data which were needed to make a statement on overall system performance.

NPS/DKL Location: MICROFORM ADA147625

**Egeberg, Lansing E., Lyle D Johnson and Neil H. Farlow.** *Operation DOMINIC. Shot SWORDFISH. Project Officers Report - Project 2.1. Radiological Effects from an*
Abstract: US forces today are under-trained in antisubmarine warfare, at a time when the world conventionally powered submarine base is at an all-time high. The conventional submarine poses a unique and potent threat to US forces, particularly in the littoral regions where ASW is the most difficult. The lessons of World War II, in which German U-boats inflicted great damage and caused a disproportionate diversion of Allied ASW assets, and the inability of British forces to detect the single Argentine submarine San Luis in the Falklands War underscore the relevance of proper planning to deal with the submarine threat in today’s joint littoral warfare arena. The approach taken by JTF and Maritime Component staffs in countering the conventional submarine is critical in the success of the maritime forces achieving dominance as an enabling force in the joint littorals.
Electronic access: http://handle.dtic.mil/100.2/ADA328139

Abstract: The U.S. Navy, is currently investigating methods for improving the fuel efficiency of Navy aircraft. Fuel saving concepts include an aircraft integrated flight performance advisory system, a pre-flight mission planning program using a desk type computer and an aircraft performance advisory system using an HP-41 DV hand-held calculator. The integrated flight performance advisory system for the F/A-18, the A-7E, and the S-3 are described in detail by reviewing the displayed outputs to the pilots and describing the required inputs and their sources. Features of each aircraft system are described in accordance with the development status of the program. The preflight mission planning program using an HP-9845 desktop computer is described for the P-3C aircraft. The approach to weather, takeoff and cruise are described by specifying input and output data. Sample displays are also shown. The hand-held HP-41 CV calculator used for flight performance predictions is described for takeoff and cruise flight modes of this aircraft.
NPS/DKL Location: MICROFORM ADA182150

Abstract: The P-3 is a shore-based, long-range aircraft designed to combat submarines. The Navy has 24 active P-3 squadrons, 13 reserve squadrons, and 5 squadrons for training and special projects. The P-3 inventory totals 441 aircraft. During its 30-year life, a P-3 is expected to undergo six overhauls at one of two Naval Air Rework Facilities, also known as depots. The study's objective was to determine whether the Navy could reduce depot overhaul turnaround time for the P-3 aircraft by improving overhaul procedures. Topics examined include: Selecting aircraft for overhaul; Inspections needed to ensure
overhauls are necessary; Overhauls can be scheduled more efficiently; Labor resources can be applied more efficiently; and Depots have excess overhaul capacity.

NPS/DKL Location: MICROFORM ADA182095


Report to the Acting Secretary of the Navy.

Abstract: The Navy's Surveillance Towed Array Sensor System (SURTASS) program, like other defense programs, has been caught in the midst of rapidly changing world events. SURTASS sensors 'listen' for acoustic signals from enemy submarines in the deep, open ocean. However, the submarine threat for which SURTASS was designed has declined dramatically with the collapse of the Soviet Union. The United States no longer faces a well-defined nuclear submarine threat in the deep water ocean areas where strategic naval conflict and antisubmarine warfare operations were expected to occur. Instead, the Navy faces an ill-defined, less predictable regional threat from diesel submarines operating in shallow water areas. Yet, the Navy continues to build SURTASS surveillance ships designed for the deep water threat. In light of the recent world changes, we examined (1) how the submarine threat environment has changed and (2) what changes the Navy has proposed regarding its SURTASS program.

NPS/DKL Location: MICROFORM ADA258570


Report to the Congress.

Abstract: To aid the Congress in its deliberations on the fiscal year 1984 defense budget, The General Accounting Office issued, from August 1982 through July 1983, 17 reports on selected weapon systems. Chapter 2 summarizes the potential impact of GAO's recommendations and observations. Chapter 3 categorizes and summarizes the major issues highlighted in each report. These issues could have a direct impact on the systems' efficient acquisition and/or operational effectiveness. These issues formed the bases for GAO's recommendations and observations. Chapters 4 through 7 contain individual report summaries. The systems which were reviewed and which are included in this overview are: AH-64; Army Helicopter Improvement Program; Patriot; Sergeant York; Stinger POST; S-3A; CG-47; Rapidly Deployable Surveillance System; TOMAHAWK; F/A-18; Over-the-Horizon Backscatter radar; The antisatellite development program; The Wide Area Antiarmor Munitions; The B-1B bomber; Light Armored Vehicle; Advanced Medium Range Air-to-Air Missile; and Trainer aircraft.

NPS/DKL Location: MICROFORM ADA133323


Abstract: Training simulators often require the participation of several people to play the role of supporting players in the simulated operation. Use of intelligent software agents to play the role of these personnel has the potential to reduce support staff and increase an instructor's control of training. This report evaluates a simulator prototype developed for the CP140 Aurora maritime patrol aircraft that incorporated intelligent software agents to play the roles of the Tactical Navigator and an Acoustic Sensor Operator. Human crews, intelligent agent crews, and mixed human-agent crews performed a simulated antisubmarine mission. Mission performance and crew communications were recorded and rated to determine whether the intelligent software agents could perform individual crewmember functions and whether they could provide the interaction necessary for crew coordination training. The results indicate
that: (1) agents can perform individual crewmembers' functions; (2) agent interaction with humans is
sufficient to allow humans to perform their own tasks; and (3) the agents did not interact in a way suitable
for crew coordination training. It is concluded that the prototype is suitable for supporting individual
training, but the agents' knowledge base must explicitly address team dynamics if crew coordination
training is to be supported.

Electronic access: http://handle.dtic.mil/100.2/ADA400717

Greenhill, S., S. Venkatesh, A. Pearce, T.C. Ly. Representations and Processes in
Decision Modelling. Victoria: Defence Science and Technology Organisation,
Aeronautical and Maritime Research Lab, 2002.
(DSTOGD0318);(DSTOAR012146);(ADA405860). 75 p.
Abstract: This report contains a survey by Curtin University on decision modelling which covers: (1)
Our current understanding of how we make decisions, and points out our qualities, our weaknesses and
the types of aids that could help us. Of note is the theory that people commit to options even though
alternatives exist once a situation has been recognised. (2) Techniques useful for eliciting and
representing knowledge about how experts make decisions. (3) What is situation assessment, and how
others have tried to capture the process and use the captured information. (4) The different technologies
that could be employed to represent the process of situation assessment. This report represents the first
step of a larger project to represent how submarine commanders assess situations.
Electronic access: http://handle.dtic.mil/100.2/ADA405860

Guidry, M. S. Whitley and B. Markowich. Boeing 767 Proximity Evaluation with F/A-
18C and S-3B Aircraft. Patuxent River, MD: Naval Air Warfare Center Aircraft Div.;
Abstract: The Boeing Company participated in the Future Strategic Tanker Aircraft program which was
intended to provide aerial refueling and aerial transport capability to the United Kingdom Royal Air Force
under a Private Finance Initiative. Boeing contracted NAWCAD Patuxent River, Maryland, under a
commercial service agreement to determine if an area of acceptable wake turbulence existed in the
proximity of a 767 aircraft in order to perform the aerial refueling mission. This was accomplished by
evaluating the 767 aerodynamic and wake turbulence effects on two receiver aircraft (F/A-18C and S-3B)
at locations behind the 767, which approximated potential aerial refueling engagement areas. During the
period of 22 and 23 June 2000, three F/A-18 and three S-3B flights were flown totaling 5.8 F/A-18 flight-
hours, 6.7 S-3B flight-hours, and 12.5 767 flight-hours. A Lear 35 cinematography aircraft was used to
document test results. The test program consisted of proximity evaluations only with no aerial refueling
pods installed on the 767 aircraft and no receiver-to-“tanker” engagements. All flights were conducted
within the Patuxent River restricted or local warning areas. At the positions evaluated, areas of
acceptable wake turbulence existed for the F/A-18C and the S-3B in the proximity of the 767 aircraft in
order to perform the aerial refueling mission. Recommend that testing continue to evaluate the 767 tanker
aircraft.
Electronic access: http://handle.dtic.mil/100.2/ADA389851

Haralabus, G., E. Capriulo and W.M. Zimmer. SWAC 4: Broadband Data Analysis
Using Sub-Band Processing. LA SPEZIA (ITALY): SACLANT Undersea Research
Centre, 2000. (SACLANT Undersea Research Centre,); (SACLANTCEN-SR-320,
ADA378129). 41 p.
Abstract: The frequency dependence of broadband active detection/localization is examined. The
analysis is based on 1200 Hz (2300-3500 Hz) LFM signals acquired during the SWAC 4 sea trial. A sub-
band matched filter scheme is devised according to which a replica of the transmitted pulse is segmented
into ten 120 Hz sub-bands and processed independently through a matched filter detector. Comparison of
target detection and ranging results indicate comparable performance for all sub-bands. However, ping-
to-pong variability of the ten correlator outputs suggest that the detection performance may be improved
by employing incoherent processing schemes. Signal-to-noise ratio is proved to be controlled mainly by noise (reverberation is the predominant noise source) rather than signal variations. The signal intensity remains proportional to the distance between source and receiver due to favorable propagation conditions. Doppler effects and sub-band detection synchronization problems which may lead to performance degradation in large time-bandwidth signal processing are addressed. A method to estimate range rate (relative velocity between source and receiver) based on single ping differential time delay between sub-band MF outputs is developed. This intra-ping technique is an alternative to the standard inter-ping method which requires multiping detection history.

Electronic access:  http://handle.dtic.mil/100.2/ADA378129


Abstract: The frequency dependence of reverberation is examined using the processing method as for the frequency analysis of target detection during the same experiment. In this experiment, reverberation is induced by abrupt changes in the bottom bathymetry (a 200 m sea mount). For the analysis of the received signal a sub-band matched filter scheme is devised, according to which, a replica of the transmitted pulse (2300 Hz-3500 Hz LFM signal) is segmented into ten 120 Hz sub-bands, each of which is processed independently through a matched filter detector. Following the necessary corrections for array gain and calibration, transmitted power spectrum and propagation loss, the matched filter data are compared to reveal the frequency dependence of reverberation. Due to insufficient in situ measurements, the propagation loss estimate is based on model calculations - a challenging task for the range dependent seafloor at the experimental site. After examining a large number of pings it is concluded that the reverberation energy calculated at the correlator output is comparable for all ten sub-bands. This leads to the conclusion that for the particular environment and experimental geometry, the frequency spectrum is not sufficiently wide to allow significant frequency variability which may indicate an optimum operational frequency.

Electronic access:  http://handle.dtic.mil/100.2/ADA389996


Abstract: In response to the Navy's need for a submarine warfare capability in shallow water areas of the oceans, NRL has been conducting a research program in shallow-water acoustics. The goal of the first phase of this program has been to determine if wave theory can be used to predict the acoustic field at long ranges from a submerged acoustic source. The approach used an iterative process involving trial models and at-sea measurements. The wave equation for the physical model is solved by numerical methods and implemented on a high-speed general-purpose computer. Since the acoustic field at long ranges is propagated in the discrete normal modes of the duct, special experimental methods were used to resolve individual modal fields so that their measured characteristics could be compared with predictions. This report presents a detailed description of the NRL normal-mode model in its current form and describes the experimental evaluation procedures and results. Salient features of the model include variable sound speed in the water, slowly variable water depth, statistically rough boundaries, sediment layering, and both shear-wave and compressional-wave propagation in the bottom. Although certain recognized problems remain to be solved, it has been demonstrated that the model can in most cases predict the characteristics of the signal field with sufficient accuracy to be a useful tool in system design, performance prediction, and tactics.

NPS/DKL Location:  MICROFORM  ADA057691

Abstract: This audit was performed at the request of Representative John Conyers, Jr., Chairman of the House Committee on Government Operations. The Chairman requested that we perform an audit of the procedures used by the Navy in soliciting a second source for the production of the AN/SQQ-89 ASW Combat System. The request was based on information that GE’s cost and pricing data may have been disclosed to WEC, and that WEC may not have been qualified to produce the combat system.

Electronic access: http://handle.dtic.mil/100.2/ADA379828


Master’s thesis.

ABSTRACT: The threat of the Soviet Union and Communism to the United States diminished with the end of the Cold War in the early 1990s. Instead, the asymmetric threat of terrorism has spread throughout the world and become a grave danger to American citizens at home and abroad. Throughout these changes in global landscape, the US Navy has adapted and given new emphasis to a variety of missions during these times of fiscal challenge. However, one of the most dangerous weapons of the Cold War, the submarine, still exists and is being proliferated widely today. Once the primary ASW aircraft used in the prosecution of submarines, the P-3C Orion, has added new equipment to perform its added warfare missions. Thus, the central focus of the thesis: Does the US Navy have the airborne capability to defend itself from current as well as projected submarine threats? The thesis will examine the relevancy of ASW today and determine whether current and future submarines pose a threat to US, its interests as well as its military. The final analysis involves an evaluation of P-3C Orion’s capability to detect adversary submarines in the contemporary as well as future operating environment.

NPS/DKL Location: MICROFORM ADA406874

Electronic access: http://handle.dtic.mil/100.2/ADA406874


Abstract: Described here is a computational method to design frangible nosecaps for air- and surface-launched undersea weapons (such as for ASROC, VLA, and Mk-50 torpedoes). WEST is a technique that can rapidly and accurately assess the state of stress and deformation of missile nosecaps intended to break up at water entry. WEST links the powerful geometry and FEM pre- and post-processor PATRAN, a potential-flow computer code that can calculate dynamic pressure-time histories of an arbitrary entry body, and the nonlinear FEA code ABAQUS. This code linkage has been validated through comparison with experimental work. WEST is a valuable analytical tool that reduces the design cycle time for frangible nosecaps.

NPS/DKL Location: MICROFORM ADA219641


Abstract: Duels between torpedoes and ships with counter measures for protection can be simulated with the computer model MUMS. In earlier versions of the model the simulated torpedoes are autonomous after firing. Recently passive sonars have been included which allows simulation of wire-guided torpedoes from submarines. The development described in this report comprises modeling of
wire-guided torpedoes from submarines. The development described in this report comprises modeling of wire-guided torpedoes launched from surface ships and/or helicopters with active sonars.

Abstract: This paper proposes a methodology for relating investments in naval infrastructure programs to investment programs in naval structure and illustrates the utility of such a methodology in trading infrastructure for structure by applying the methodology to organic mine countermeasure and shallow water antisubmarine operations.
Electronic access: [http://handle.dtic.mil/100.2/ADA394149](http://handle.dtic.mil/100.2/ADA394149)

Abstract: An Airborne Optical Receiver (AOR) was developed and tested to investigate the propagation and reception of optical communications uplinks from a submerged laser source to an overflying fleet aircraft. The AOR was flown in a P-3C Orion aircraft for an at-sea test off the southern California coast in August, 1990. A green laser transmitter was suspended from the Research Platform FLIP at depths of 15 to 45 m. During six nights of operations, the AOR received the laser light at various test geometries and through clear and cloudy conditions. This represents the first optical uplink cloud experiment at visible wavelengths. Results show that optical pulses in clouds are significantly more forward-scattered than modeled. The results can be explained by Mie scattering theory. Measured cloud attenuation and pulse stretching agreed with an existing optical propagation model. Significant attenuation and signal spreading due to haze and fog was measured and compared with theory.
NPS/DKL Location: MICROFORM ADA264687

Kotchka, Jerry Allen. **On a Bayesian methodology to the solution of the Naval ASW screen placement problem.** Columbus, OK: OSU, 1970. 182 l.
Thesis (Ph. D.)--Ohio State University, 1970.
NPS/DKL Location: THESIS K8345

Abstract: The Navy plans to have 10 Trident II submarines by the end of fiscal year 1997. Currently, it has six operational Trident II submarines and four others are under construction. Each Trident II submarine carries 24 D-5 missiles. Each D-5 missile is equipped with the MK-6 guidance system, which is comprised of an inertial measurement unit and an electronics assembly. The inertial measurement unit senses velocity and direction and relays this data to the electronics assembly, which issues flight control commands to the missile.
NPS/DKL Location: MICROFORM ADA283196

Abstract: As investigation was made of the practicality of assessing anti-submarine warfare (ASW) team performance by means of measures of the volume of communications. A system for classifying communications was developed based on an analysis of published data on communication rates (e.g., number of evaluative messages sent per minute) of ASW helicopter crews. Next, communication rates were recorded for ship’s teams during two exercises in the 14A2 ASW team trainer. Communication rates were computed for various types of messages over the ship-to-ship and ship-to-air circuits. Rates were compared against instructor grades for individuals, subteams, and teams. Communication rates on the intership circuit tended to be negatively correlated with grades, primarily because instructors gave lower grades to teams doing excessive talking. Rates on the ship to air circuit were positively correlated with performance on the later exercise where two aircraft were used rather than one and where a much greater volume of information needed to be transmitted. On the internal circuits, few significant relationships were found between communication rates and performance. Implications of the findings for development of an objective performance measurement system for team training are discussed. (Author)


Abstract: Canada like several other countries has limited resources to trade-in its outdated and ageing fleets for state-of-the-art weapon systems. With the CF188 and the CP140, the Canadian Forces (CF) have chosen, as with the CF116 before, to perform a structural and systems upgrade. These upgrades will allow the aircraft to meet their operational requirements until the first quarter of the next century. The choice for this course of action is based on option analysis studies. In the end, fleet modernisation has proven to be The most economical solution. This paper will present the approach taken and the assumptions made for the various scenarios studied to reach That conclusion. Avionics packages are readily available off-the-shelf and in most cases the decision is based mostly on structural limitations. Hence in-service failures and results of full scale fatigue tests obtained through collaborative agreements can be a cost effective way to determine The cost of ownership of each fleet. The paper will briefly talk about The concept taken for the CP140 but will use the CF188 as the demonstration test case.

Electronic access: http://handle.dtic.mil/100.2/ADA381871


Abstract: Cockpit moving-map systems have provided heightened situation awareness to the fighter pilot for more than ten years, but these systems have yet to be integrated into military helicopters. The Navy now plans to install a moving-map system into its new, multi-functional MH-60S helicopter, which will perform mine countermeasures (MCM), combat search and rescue, special operations, and logistics. Other H-60 variants (e.g., SH-60B) perform anti- submarine warfare (ASW), surface warfare, surface surveillance, and other missions. Naval Research Laboratory scientists were tasked to demonstrate and evaluate the potential of a cockpit moving-map for enhanced situation awareness during multi-functional helicopter missions (particularly MCM and ASW). This project consisted of three main tasks: (1) conduct a web-based survey of pilots and aircrew experienced in MCM and ASW for their preferences with respect to various environmental data that could be displayed in a moving-map; (2) demonstrate and evaluate pilot-preferred data on existing moving-map displays; and (3) recommend potential data types to be collected and displayed in a multi-mission helicopter.

Abstract: The S-3A aircraft has (4) ejection seats. Both the pilot and copilot have Command Eject Selector levers which allow them the option to eject all crewmembers or 'Self Eject.' If one of the aft seats is unoccupied, and 'Command Eject' is selected, the unoccupied seat will accelerate ahead of the occupied seat next to it. Two hazards exist; first, the crewmember next to the unoccupied seat could be burned by the rocket plume from the empty seat which has a higher acceleration; second, the empty seat could tumble into one of the other seats because the center of gravity and the center of rocket thrust are too far apart. To eliminate these hazards it is necessary to ballast the unoccupied seat. This is presently being done with anthropomorphic test dummies, if they can be obtained. Unfortunately these dummies have various weights and are usually damaged (i.e. arms, legs, or head missing). There is no guarantee that the center of gravity is in the proper location to prevent tumbling. To correct this potentially dangerous situation the Naval Air Systems Command tasked the Naval Air Development Center to design a ballast block. After the initial prototype was developed and tested, references (1) and (2) recommended changes to be incorporated into the final design. All of these recommendations have been incorporated into the final design. The S-3A Ballast Block is a 169 pound (77 Kg) assembly of four (4) interlocking aluminum blocks. It is used to control the trajectory of an unoccupied 1E-1 ejection seat. Tests indicate that it meets all functional and structural requirements for use in the S-3A aircraft.

NPS/DKL Location: MICROFORM ADA147685


Abstract: NAVAIRTESTCEN was tasked by reference (a) to conduct dynamic interface (DI) testing of the SH-60B helicopter on the DDG-993 class ships. Testing was conducted on board the USS CALLAGHAN, DDG-994, from 14 through 18 May 1984. Lack of ambient winds precluded completion of day/night launch/recovery envelopes. Further testing is possible 11 through 15 June 1984. Data were collected using the DI Pilot Rating Scale (PRS) presented in enclosure (1).

Electronic access: http://handle.dtic.mil/100.2/ADA383636

Master's thesis.

Abstract: *There were a series of events that led to the consolidation and downsizing of the Integrated Undersea Surveillance System (IUSS). These events occurred simultaneously during a period when the United States was defining its National Strategy toward the Soviet Union. What caused the IUSS Downsizing and consolidation. Budget cuts. End of the Cold War (Change in National Strategy). The Dissolution of the Soviet Union as a threat. Base realignment and closure. Were the decisions made valid now that it is 2001, eight years after the consolidation.*

Electronic access: [http://handle.dtic.mil/100.2/ADA401150](http://handle.dtic.mil/100.2/ADA401150)


Abstract: *Many industries operate high value equipment often remotely -- that requires reliable performance in severe environments. Similarly, the U.S. Navy's submarine TASs stress conventional approaches to operating and maintaining this system level capability comprised of integrated hydraulic, mechanical, electronic and acoustic sub-systems. The Navy invested in a Condition Based Maintenance (CBM) proof of concept for an individual ship TAS by developing the Thinline Health Monitoring System (THMS). THMS collects real-time discrete reliability data and synchronizes this data with other historical information and the TAS's current condition assessment. As a predictive "intelligent code" it uses Bayesian Belief Networks (BBNs) to extract the full value of real-time data and provide a complete range of system performance evaluations -- from diagnosis to prediction. Drawing upon THMS' success, the U.S. Navy supported expanding this capability fleet-wide to encompass health assessments of the entire submarine TASs population. Plans have been developed to build a relational database that is accessible to a geographically separated towed systems community via the Internet for interactive analysis and diagnostics. These system level analyses and first principal processes are directly translatable to other government and commercial critical systems that cannot afford unscheduled -- or unnecessary -- maintenance.*

NPS/DKL Location: MICROFORM ADA412395

McConnell, James M. **A possible change in Soviet views on the prospects for anti-submarine warfare.** Alexandria, VA: Center for Naval Analyses, Naval Planning, Manpower, and Logistics Division, [1985]. (ADA153610); (Professional paper; 431); Soviet Union special studies, 1982-1985; 9); (Special studies series (University Publications of America, Inc.). 19 p.

Abstract: *In the summer of 1982 there was an apparent shift in Soviet views on the future potential for combating submarines. The following points trace the perceived evolution of this shift. (1) From the early 1970s, Soviet emphasis had been on the submarine's great capacity for concealment and the decreasing cost effectiveness of anti-submarine warfare (ASW) as a 'law-governed' trend extending into the foreseeable future; (2) The first sign of a new perspective came in 1979-80; here, the Soviets implied that no significant breakthrough in ASW was expected during the next five-year plan (1981-85), but they did not rule out an effective innovation after that; (3) In 1982, however, the Soviets apparently saw an operational capability arising ahead of this schedule. Using alleged U.S. views as an almost certain surrogate for their own, they indicated that a 'technological break-through' in ASW (possibly nonacoustic*
and space-based) was imminent, perhaps (this is the best interpretation) before the end of the current planning period in 1985. A new ‘law-governed’ trend in naval affairs was set out: the growing susceptibility of submarines to detection and the increasing cost effectiveness of ASW; (4) If Moscow is on the verge of a long-range detection capability, then one might want to speculate on the means they would develop for submarine kill. It is conceivable they might revive the concept, abandoned in the 1970s, of using a submarine-launched ballistic-missile (SLBM) system for hitting mobile targets as sea.

NPS/DKL Location: MICROFORM ADA153610


Abstract: Operational maneuver, one of the principles of operational art, is key to the Navy’s doctrine in From the Sea and Forward From the Sea. The objective of operational maneuver is to strike quickly and violently to isolate and frustrate the enemy and destroy their forces and will to fight. The application of operational maneuver can enable U.S. forces to overcome the shallow-water diesel submarine threat by using speed and concentrated fires to avoid the enemy’s strengths and attack their weaknesses, thus isolating, neutralizing and destroying the threat.

Electronic access: http://handle.dtic.mil/100.2/ADA298144


Abstract: The objectives of Project 1.2 were to determine and evaluate the effects of an underwater nuclear explosion on the operational capabilities of shipboard sonar and other types of hydroacoustic systems. Project 1.3b included all measurements at ranges greater than 10 nautical miles and the results of these measurements constitute the subject of this report. This report concerns the effects of the underwater nuclear explosion, Sword Fish, on: (a) Long-range active detection systems at the first convergence zone (25 to 30 miles); (b) Passive shipboard or submarine sonars at a few hundred miles; and (c) Long-range passive detection and surveillance at Sound Surveillance System (SOSUS) and Missile Impact Locating System (MILS) stations at several hundred to several thousand miles. A submarine station at the first convergence zone and five shipboard stations at ranges from 200 miles to 5,000 miles recorded signals from hydrophones suspended at various depths to approximately 2,000 feet. Submarines on other assignments recorded signals on standard submarine sonar equipment on a not-to-interfere basis. SOSUS and MILS stations operated normally during the period and also made special magnetic-tape and strip-chart recordings of signals from single hydrophones from before burst time to several hours after burst.

NPS/DKL Location: MICROFORM ADA995394


Abstract: Vertical and short takeoff and landing (V/STOL) aircraft promise new operational capabilities for the Navy. In the past, new vehicle types have been slow in gaining acceptance because of the difficulty in visualizing how these new vehicles should be employed. Once built, experience gained with the vehicle evolved into an operational concept exploiting its best qualities. Now, competition for fiscal resources has reached a level from which it may be difficult to justify the development of any new vehicle
without having a well-defined operational concept in hand. This report discusses the use of existing large
helicopters to develop operational concepts for V/STOL in naval applications. (Author)
NPS/DKL Location: MICROFORM ADA139354

Extracted version of report dated 21 Jan 63.
No abstract available.
NPS/DKL Location: MICROFORM ADA995502

Abstract: The Naval Underwater Systems Center was formed in 1970 by the merger of two independent laboratories of the Naval Material Command: the Naval Underwater Weapons Research and Engineering Station (NUWS), Newport, Rhode Island, and the Naval Underwater Sound Laboratory (NUSL), New London, Connecticut. These two complexes are now the principal laboratories of NUSC. In July 1971, the Atlantic Undersea Test and Evaluation Center (AUTEC) in the Bahamas was made a detachment of NUSC. A basic and applied research program supporting systems development is a major thrust at the Center, and activities at NUSC cover all phases of the Center's primary mission responsibilities as the Navy's principal research, development, test, and evaluation center for submarine warfare and submarine weapons systems. These activities include responsibilities in programs in surface ship and submarine sonars, ASW weapons, combat control, and in undersea ranges--including the management of the AUTEC range complex.
NPS/DKL Location: MICROFORM ADA103242

Abstract: The declining military budget has resulted in service life extensions for many weapons systems. Conversely, mission essential systems, such as the avionics suite, on naval aircraft extend, must contend with the scheduled phase out of subcomponents and microcircuits over the next few years. This unplanned obsolescence will have a costly impact on the ability of naval aviation to maintain weapons systems in a high state of operational readiness. Identifying the size of this problem is made more complex because provisioning data (for older systems) is often incomplete or inaccurate, making it difficult to cross obsolete part numbers to specific system applications. This paper describes a proactive process for analyzing avionics system supportability issues involving microcircuit obsolescence and other factors, such as mission criticality, reliability, supply and demand, and aircraft allowance. Based on this analysis, a comprehensive, life cycle model is developed to predict time critical mission degraders and offers solutions for solving supportability issues.
Electronic access: [http://handle.dtic.mil/100.2/ADA309766](http://handle.dtic.mil/100.2/ADA309766)

Abstract: This report should be read by all who are interested in the acquisition of the Navy's Advanced Deployable System (the System). The report addresses acquisition issues that require higher management attention before the System program should be allowed to progress further through the acquisition process. The System, a Navy Acquisition Category II program, is a next-generation, ship-deployable, undersea surveillance system that is designed to operate in littoral waters, The System is
linked to a land facility for data processing, evaluation, and reporting. The System will be used to conduct missions, such as threat port surveillance, friendly port protection, area defense, area sanitation, and strategic indications and warnings. The System will have the ability to be installed overtly or covertly, depending on the needs of the Joint Task Force Commander. The program office’s estimate includes $793.7 million for research, development, test, and evaluation for all four blocks of the evolutionary acquisition strategy and $785 million for procurement for the first two blocks.

NPS/DKL Location: MICROFORM ADA406702
Electronic access: http://handle.dtic.mil/100.2/ADA406702

Abstract: The purpose of the evaluation was to verify that all the deficiencies from OT-IIC OPEVAL has been corrected prior to approval for full fleet introduction. The evaluation was based on the results of non-scenario operational tests conducted under Project M756, supplemented by the results of OPEVAL, developmental testing, and operational experience. Based on this evaluation, the CPU-152/A SCADC as installed in the S-3A/B aircraft is determined to be operationally effective and operationally suitable. Approval for full fleet introduction of the CPU-152/A is recommended. The SCADC uses air pressure from the pitot static system and temperature signals from the temperature probe to provide air data outputs for navigation, cockpit display, sonobuoy and weapon delivery systems, Automatic Flight Control System (AFCS), and altitude reporting. While the digital SCADC is a form, fit, and function replacement for the existing S-3 Airspeed Altitude Computer Set (AACS), it has, in addition, a Built-in-test (BIT) function allowing maintenance personnel to determine system status without removing the unit. Keywords: Antisubmarine aircraft. (KR)
NPS/DKL Location: MICROFORM ADA226310

Abstract: The Mk 15 torpedo, designed and developed by the former Naval Torpedo Station in Newport, Rhode Island, in the 1930s, was the last destroyer-launched antisurface ship weapon to see wide service use. Longer, heavier, and more powerful than its predecessors, it was the Navy's principal destroyer torpedo when World War II began. During the early war years, three new classes of improved Navy destroyers having twin deck mounts of multiple torpedo tubes began entering the fleet. As is recounted in this booklet, salvos of Mk 15 torpedoes launched from those destroyer tubes proved decisive on several occasions in the Pacific campaign.
NPS/DKL Location: MICROFORM ADA274999

Abstract: This paper addresses applied procedures for nonlinear aerodynamic model development and extraction from flight data for the S-3B Viking aircraft. The entire analysis procedures, from dynamic flight test data management to final blending and validation of the upgraded aerodynamic model, was performed within the Integrated Data Evaluation and Analysis Systems (IDEAS) developed by SAIC. IDEAS is a powerful database management system and analysis software containing a full complement of flight data preprocessing, calibration, simulation, model estimation, model verification, and validation tools.
Abstract: The shock loading in ships and the response of shipboard machinery were measured during Shots Wahoo and Umbrella to: (1) determine safe- and shock-damage ranges, particularly with respect to shipboard machinery and equipment, for delivery of antisubmarine nuclear weapons by destroyers and submarines; (2) determine the intensity and character of the shock motions on a submarine and on a merchant ship under quasi-lethal attack by and underwater nuclear explosion; and (3) acquire shock-motion data and correlate such data with other measurements and with theory in order to extrapolate the results to other attack geometries. Conclusions include: (1) The shock damaging ranges for ships from underwater explosions depend greatly on the design and condition of the machinery and equipments as well as on charge size, burst depth, water depth, and the like. (2) Immobilization ranges for a destroyer are given as horizontal ranges from surface zero to the center of the ship. (3) Temperature gradients in the water increase or decrease the damage ranges.

NPS/DKL Location: MICROFORM ADA995438


Abstract: The problem addressed is the extent to which the United States Navy used Ultra, or Special Intelligence, in the campaign against the German U-boats. Information was gathered through published and unpublished sources. Through a chronological approach, United States Navy involvement is traced from entry into the war until its conclusion. Many factors are involved in the final outcome of the war and Ultra is only one. The Battle of the Atlantic was long and gruesome rather than short and spectacular. The United States Navy used Ultra along with technology, tactics, brilliant leadership and courageous men at sea to win the Battle of the Atlantic in World War II. The lessons for the future are clear. If the United States intends to oppose the Soviet submarine force at sea anywhere in the world, then we must maintain the lead in intelligence, tactics and technology. Further, and most importantly, we must strive to regain superiority of forces in those ocean areas where our interests are at stake.

NPS/DKL Location: MICROFORM ADA089275


Abstract: Described here is the application of a nonlinear finite element analysis (FEA) technique to predict the structural behaviors for a class of brittle materials that shows near-complete brittleness when loaded in tension, but exhibits some ductility when compressed. An ABAQUS* constitutive model, consisting of an isotropically hardening yield surface, which is active when the stress state is dominantly compressive, and an independent crack detection surface to determine if a point in the material fails by cracking in tension, is employed to simulate the failure of the brittle material. The application of the technique to determine if a potential frangible nosecap design of the Vertical Launch Antisubmarine Rocket (VLA) would break up as intended upon water impact for a given entry condition is presented as an example. Frangible nosecaps, Large deformation, Non-linear structural analysis, Water entry

NPS/DKL Location: MICROFORM: ADA276835

Abstract: *Develop the piecewise quadratic strength tensor theory for composite materials and demonstrate its applicability to the available biaxial fracture data on composites. The theory will have application to current composite structures of Naval Ocean Systems Center's interest such as transducers and future composite structures such as torpedo hull sections, Vertical Launch ASROC (VLA) nosecaps, and tethered deep submergence structures. The theory can also be used with a wide variety of other NAVY structures such as aircraft and submarine substructures.*

NPS/DKL Location: MICROFORM ADA190929


Proceedings from the Navy Interoperability Workshop, 30-31 May 2001; sponsored by NDIA. Viewgraphs only.

Abstract: *Presentation given at the Navy Interoperability Workshop, held on 30-31 May, 2001, and sponsored by the National Defense Industrial Association.*

Electronic access: [http://handle.dtic.mil/100.2/ADA393700](http://handle.dtic.mil/100.2/ADA393700)


Abstract: *The report consists of a summary of each pass with crew comments included. Users of the data should review the pass summaries to be alerted for anomalies that may have occurred during the collection or noted by processing or analysis people. The appendix contains plots of critical parameters as a function of time. This information is provided so that users can examine, in some detail the exact time and magnitude of observed anomalies. In addition users can go back to this data to determine if there is a correlation between funnies observed during processing and the engineering data. For example, if there was a blank strip in the image it might correlate with the transmitter power plot showing that the transmitter was off during that time. All of the data shown in the plots is also recorded on the HDDT's in the Aux. data block and could be reproduced by the user. These plots are included in the appendix as a convenience for users of the data. The appendix is available upon request and thus is not included with this set of data.*

Electronic access: [http://handle.dtic.mil/100.2/ADA368196](http://handle.dtic.mil/100.2/ADA368196)


Abstract: *This report is an appendix containing the results of the P-3 passes and radar imagery data.*

Electronic access: [http://handle.dtic.mil/100.2/ADA368195](http://handle.dtic.mil/100.2/ADA368195)


Abstract: *This report is written as an aid to users of the SAR data collected by the P-3/SAR on 27-28 June 1995. The data set generated consists of: (1) HDDT #E1439, (2) HDDT #E1440, (3) HDDT#E1441,
(4) HDDT #E1442, (5) Mission Plan disk, data, etc., (6) Navigation disks, (7) Post Pass disks, and (8) Post Pass Summary Sheets. The report consists of a summary of each pass with crew comments included. Users of the data should review the pass summaries to be alerted for anomalies that may have occurred during the collection or noted by processing or analysis people. The appendix contains plots of critical parameters as a function of time. This information is provided so that users can examine, in some detail the exact time and magnitude of observed anomalies. In addition users can go back to this data to determine if there is a correlation between funny observed during processing and the engineering data. For example, if there was a blank strip in the image it might correlate with the transmitter power plot showing that the transmitter was off during that time. All of the data shown in the plots is also recorded on the HDDT's in the Aux. data block and could be reproduced by the user. These plots are included in the appendix as a convenience for users of the data. The appendix is available upon request and thus is not included with this set of data.

Electronic access: http://handle.dtic.mil/100.2/ADA368075


Electronic access: http://handle.dtic.mil/100.2/ADA368074


Abstract: The report consists of a summary of each pass with crew comments included. Users of the data should review the pass summaries to be alerted for anomalies that may have occurred during the collection or noted by processing or analysis people. The appendix contains plots of critical parameters as a function of time. This information is provided so that users can examine, in some detail the exact time and magnitude of observed anomalies. In addition users can go back to this data to determine if there is a correlation between funny observed during processing and the engineering data. For example, if there was a blank strip in the image it might correlate with the transmitter power plot showing that the transmitter was off during that time. All of the data shown in the plots is also recorded on the HDDT's in the Aux. data block and could be reproduced by the user. These plots are included in the appendix as a convenience for users of the data. The appendix is available upon request and thus is not included with this set of data.

Electronic access: http://handle.dtic.mil/100.2/ADA368198


Abstract: This appendix contains the data recorded from the P-3 passes.

Electronic access: http://handle.dtic.mil/100.2/ADA368199

Abstract: This historical review traces the development of the role of the Army Air Corps in antisubmarine warfare. Pre-war plans exempted the Air Corps from this duty. Despite lack of training and equipment, the Air Corps contributed significantly to the defeat of the submarine threat. In defeating this threat, the Air Corps had to first battle the Navy's strategy of using airplanes to escort convoys. Before being relieved of antisubmarine warfare duty, the Air Corps had proved the necessity of using the airplane in an offensive role to search and destroy submarines.

NPS/DKL Location: MICROFORM ADA157118


Abstract: This study attempts to determine whether or not the existing conventional military forces and defense systems in North America are adequate both to meet commitments to NATO in the event of a major European conflict and provide for continental security. Investigation reveals that Canada is weakly defended relative to the capabilities of the USSR to project forces onto her territory. Thus, should the USSR choose to exploit this vulnerability by executing rear area military operations on the North American flank at the outset of a NATO-Warsaw Pact conflict, she could succeed in diverting crucial U.S. and Canadian reinforcements away from their primary missions on the battlefields of Europe. (author)

NPS/DKL Location: MICROFORM ADA094983


NPS/DKL Location: FEDDOCS Y 4.AR 5/2 A:989-90/40


Abstract: This report summarizes the scientific efforts of the Deep Submergence Program at the Navy Electronics laboratory, San Diego, California. Since its inception in 1958, the program has been vitally concerned with development of techniques, instrumentation, and vehicles to fulfill its assignment – research of the marine environment, from the continental shelf to the abyssal sea floor. While NEL's primary interests are in relating applied research data in marine acoustics, biology, geology, and physical oceanography to antisubmarine and submarine warfare projects, the Deep Submergence Program has also added significantly to man's basic knowledge of the ocean sciences.

NPS/DKL Location: MICROFORM ADA074138


Abstract: An evaluation of FP500 and FP1500 paint replacement film (applique) small-scale coupons with 52-4 adhesive installed on the S-3B aircraft was conducted during 225 hr of laboratory tests and 2
flights totaling 2.0 flight-hours to determine system suitability for large-scale coupon evaluation. Complete adhesion of the film to the surface of the aircraft during basic maneuvers is an enhancing characteristic that will promote reliable performance of FP500 and FP1500 applique material reducing corrosion and maintenance down time aircraft. Tattering of prepeeled (failed) sections of the applique was an enhancing characteristic that will prevent any in-flight failures from becoming catastrophic failures. The capability of the adhesive to adhere to the film and not the aircraft surface during applique removal is an enhancing characteristic that will facilitate the rapid removal of the applique. There are no deficiencies.

Electronic access: http://handle.dtic.mil/100.2/ADA388188


Abstract: Second strikes are dominated by submarine-launched missiles in the absence of defenses, but shift to aircraft at modest levels of defense. Defenses protect some retaliatory missiles, but not enough to retaliate strongly. With defenses, missiles should be vestigial and could be eliminated without penalty. Then aircraft could also be significantly reduced without impacting stability. The combination of parameters that maximizes cost effectiveness also maximizes midcourse effectiveness and crisis stability.

Electronic access: http://handle.dtic.mil/100.2/ADA344705


Trans. of Marine-Rundschau (Germany, F.R.) n10 p. 454-459 1983.
No abstract available.

NPS/DKL Location: MICROFORM ADA074138


Abstract: This report summarizes research on both metallic and ferrite magnetostrictive type transducers. The research was directed toward (1) establishing methods for calculating how a magnetostrictor responds to large amplitude excitation, (2) determining how magnetostrictive elements respond to uniaxial static compressive stresses, (3) investigating the effect of hydrostatic stress on the important magnetostrictive parameters lambda and mu, (4) extending existing theory to include the dissipative forces inside a vibrating magnetostrictor, (5) investigations of the coupled vibrational modes of a ferrite tube magnetostrictor, and (6) investigations of magnetostrictive ferrite transducers for high power sonar applications. The lack of a suitable nonlinear theory for the behavior of magnetostrictors under large amplitude excitations dictated the empirical approach taken. However, throughout the contract limited work was directed, based upon these empirical results, toward the possible formulation of a nonlinear theory. (Author)

NPS/DKL Location: MICROFORM AD0471004


Patent, Filed 28 Dec 64, patented 23 Mar 99 PATENT-5 886 284, supersedes PAT-APPL-423 640-64. Government-owned invention available for U.S. licensing and
possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231.

Abstract: The invention pertains to an arming and safing system for a missile having an acceleration responsive mechanism for actuating a timing device upon launching to insure arming only after the passage of predetermined period of time, and an omni-directional impact switch for activating a dudding switch in case of missile impact at a distance less than a minimum safe distance from the launching vehicle.

Electronic access: http://patft.uspto.gov/netahtml/srchnum.htm


Abstract: The invention pertains to an arming system for a missile which prevents destruction of the missile outside of a specified area. The missile may be launched from a submarine, and follow a water-air-trajectory, and includes a variable-range timer acting in conjunction with an impact detection system. The timer drives arming switches to the armed condition after a predetermined time, and then opens the switches after a second predetermined time, which establishes a maximum range for detonation of the missile warhead.

Electronic access: http://patft.uspto.gov/netahtml/srchnum.htm


Abstract: A gating circuit for a missile guidance system having a capacitor for supplying the output signal together with plurality of silicon controlled rectifiers for applying or removing a supply voltage to the capacitor.

Electronic access: http://patft.uspto.gov/netahtml/srchnum.htm


Abstract: Details are given of the expression used to describe the aerodynamics and kinematics of the Sea King Mk.50 helicopter during steady flight and low rate maneuvers up to an advance ratio of 0.3. The aerodynamics/kinematics formulation is a major component of the Sea King mathematical model developed by Aeronautical Research Laboratories (ARL) for flight simulation of this Anti-Submarine Warfare helicopter.

NPS/DKL Location: MICROFORM ADA174029

Abstract: Shot Sword Fish was an operational test of the ASROC antisubmarine weapon system. The general objectives of the project were (1) to record and measure the formation, growth, and dissipation of the visible surface phenomena, including slicks, spray domes, plumes, fallout, base surge, and foam patch resulting from the underwater detonation of an ASROC weapon; (2) to use the data obtained to estimate the actual depth of burst, position of burst, yield, and bubble period; (3) to determine the location of ships and platforms in the experimental array before, during and after the test; (4) to provide surface-phenomena time-of-arrival data at platforms and ships in the array for use by other projects; and (5) to make the results available for improving the surface-phenomena scaling and prediction techniques which are currently employed for establishing delivery and lethal ranges for fleet nuclear weapons. In general, there was good agreement between the observed dimensions of the Sword Fish phenomena and the predictions.


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NPS/DKL Location: GENERAL D763.M3 S5


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NPS/DKL Location:  BUCKLEY D581 .W9

NPS/DKL Location:  GENERAL D582.J8 Y38 2000

MIDGET SUBMARINES, KAITEN (HUMAN TORPEDOS) & FROGMEN


NPS/DKL Location: BUCKLEY D780.F3 1995


Swedish translation of The X-craft raid

NPS/DKL Location: GENERAL D772.T5 G2


Czech translation of: The X-craft raid.


Based on Yamaguchi Hosou television program: Shishatachi no yuigun: Kaiten ni chitta gakutoheii no kiseki.


Originally published: London: Arms and Armour, 1996


NPS/DKL Location: GENERAL D744 .D54 1999


________. **En avion sous la mer.** Paris, P. Horay, [1956]. 222 p.


Shean, Max. **Corvette and Submarine.** Claremont, WA: M. Shean, 1992. 275 p. Transfered from the corvette Bluebell to X-craft, he took part in the raids on Tirpitz, Bergen and in the Far East.


________. **The heroes of Rimau: unravelling the mystery of one of World War II's most daring raids.** Leo Cooper, 1991. 314 p.

________. **The heroes of Rimau: unravelling the mystery of one of World War II's most daring raids.** Kuala Lumpur: S.A. Majeed, 1992. 314 p.


Thomson, Peter And Robert Macklin. Kill the tiger: the truth about Operation Rimau. Sydney: Hodder, 2002. 306 p. These courageous men were part of Operation Rimau (Malay for tiger) which would use the latest one-man submarines - Sleeping Beauties - developed by Royal Navy scientists in Britain and yet to be tested in combat.


NPS/DKL Location:  BUCKLEY D784.G7 W2


**Q-SHIPS**

Auten, Harold.  *"Q" boat adventures, the exploits of the famous mystery ships.*  [London], H. Jenkins limited, [1935].  289 p.
NPS/DKL Location:  BUCKLEY D581 .A9

NPS/DKL Location:  GENERAL D783 .B49 1999
Originally published: London: Leo Cooper, 1999
NPS/ DKL Location: GENERAL D581 .B65 1999


NPS/ DKL Location: BUCKLEY D581 .C44


**SUBMARINES -- GENERAL**


NPS/DKL Location: GENERAL V857 .B9


NPS/DKL Location: GENERAL V857 .C6


NPS/DKL Location: BUCKLEY V857 .C652 1999

NPS/DKL Location: GENERAL V214.5 .C65 1988


Thesis (Ph.D.), Syracuse University, 1970.


Dunmore, Spencer. **Lost subs: from the Hunley to the Kursk, the greatest submarines ever lost - and found.** Cambridge, MA: Da Capo, 2002. 178 p.
Contents: The silent service -- August 12, 2000: the final moments aboard the Russian Navy's nuclear submarine Kurst -- The birth of the submarine: A brief history of early subs, including the Turtle and the Nautilus -- The first underwater weapon of war: the
American Confederate sub H.L. Hunley -- The submarine comes of age: the influence of John Holland on submarine design -- Battle under the sea: the submarine has now become a formidable weapon, as Germany's U-boats prove during the First World War - - Lost in peace: two submarine tragedies, the US Navy's Squalus and the Royal Navy's Thetis, dominate peacetime headlines -- The U-boat war: Germany revolutionizes the way submarines are used in combat -- A casualty of the Cold War: a tiny piece of aluminum foil spells disaster for the US Navy's nuclear submarine Scorpion -- Disaster under the Barents Sea: the tragic story of the Kursk -- For those in peril.

NPS/DKL Location: GENERAL VB230 .D97 2002


NPS/DKL Location: GENERAL V857 .F75 1984


_______. Submarine warfare past, present and future. 2nd ed. London: Grant Richards, 1903. 332 p.

NPS/DKL Location: GENERAL V210 .F9 MISSING


English translation of Unterseebootbau.


German translation of Submarines of the World

Jameson, William. **The most formidable thing; the story of the submarine from its earliest days to the end of World War I.** London, R. Hart-Davis, 1965. 280 p.

Jane's Information Group. **Jane's underwater warfare systems.** Coulsdon, Surrey, UK: Jane's Information Group, annual.
NPS/DKL Location: REFERENCE V214 J36 YY/YY

Abstract: The end of the Cold War has left the United States as the world's sole superpower. The ability of the United States to strike deep into the territories of most nations with impunity represents a new security threat to many nations. Defeating the U.S. military is not feasible in most cases, but balancing the United States may be possible, especially with weapons of mass destruction (WMD). Although WMD might provide a formidable deterrent, their technical, political, and economic costs preclude most nations from pursuing them. On the other hand, modern conventionally powered submarines are easier to obtain and operate and could present a significant deterrent to U.S. military force. This thesis assesses whether the perceived threat posed by the United States has emerged as a motivation for acquiring conventionally powered submarines since the end of the Cold War. After examining the motivations behind the recent submarine acquisitions of India and Iran, this thesis presents an economic model to predict when developing nations will be able to afford submarines if they choose to acquire them.
Electronic access: http://handle.dtic.mil/100.2/ADA333352
NPS/DKL Location: THESIS J7115


NPS/DKL Location: GENERAL V857 .K65 1987

Kvitnitskii, Aleksei Alekseevich. **Bor’ba s podvodnymi lodkami (po inostrannym dannym).** 125 p.
NPS/DKL Location: GENERAL V210 .L6

NPS/DKL Location: FOLIO V857 .L7

NPS/DKL Location: FEDDOCS D 208.207:58


NPS/DKL Location: GENERAL V210 .M52 1976

NPS/DKL Location: GENERAL V857 .M55 1984

NPS/DKL Location: GENERAL V857 .M54 1982

NPS/DKL Location: GENERAL V857 .M54 1991


NPS/DKL Location: REFERENCE V857 .J3

NPS/DKL Location: GENERAL V210 .M66 1987

NPS/DKL Location: GENERAL VA41 .P75 1984


NPS/DKL Location: REFERENCE VC345 .P75 1997


Abstract: This document presents the Department of the Navy (DON) Exploratory Development (6.2) Investment Strategy, which establishes the focus and major thrusts of the 6.2 Program. The Navy’s investment strategy for its exploratory development activities is derived from a national security strategy that mandates continued fulfillment of U.S. responsibilities in both Europe and Asia. In addition, the changing world environment will increase our responsibilities with respect to Third World nations. Successful implementation of U.S. strategy presumes that our naval forces will maintain technical superiority in their weaponry and platforms. As such, our warfighting strategy is achievable only if our nation maintains its current technological leadership. The Soviet Union’s quantitative advantages and qualitative advances in space, submarine warfare, cruise missiles, and electronic warfare are tangible evidence that our ability to maintain a technological edge clearly is being challenged. Proliferation of high technology will continue to expand on the world arms market and will become prevalent in the Third World. Therefore, the requirement to maintain technological superiority remains absolutely essential.

NPS/DKL Location: MICROFORM ADA229337


Abstract: The United States is heavily reliant on sea based logistics shipping. This shipping gives the United States great flexibility but it is also a critical vulnerability. During WW II Japan was a nation dependent on maritime shipping and Japan failed to provide adequate resources to protect that shipping. The results were disastrous. The U.S. and Great Britain also experienced attacks on maritime shipping in WW I and II. Resources were allocated and tactics developed to counter the German submarine threat.
Current U.S. doctrine addresses protection of maritime shipping, but without a credible threat and with ever decreasing Naval resources, it is doubtful that the issue of maritime force protection will be seriously addressed until disaster strikes.

Electronic access: [http://handle.dtic.mil/100.2/ADA370875](http://handle.dtic.mil/100.2/ADA370875)

NPS/DKL Location: GENERAL V210 .S7


NPS/DKL Location: GENERAL VC345 .T48 1997


NPS/DKL Location: FEDDOCS D 201.2:W 89

NPS/DKL Location: FEDDOCS D 5.202:W 89/2

NPS/DKL Location: GENERAL V857 .V35 1995


**SUBMARINES -- GENERAL -- BIBLIOGRAPHIES**


NPS/DKL Location: REFERENCE VM365.Z9


NPS/DKL Location: REFERENCE V857.A26


NPS/DKL Location: REFERENCE D780.S35 2000

**SUBMARINES -- GENERAL -- FICTION (SELECTED AUTHORS)**


DKL Location: LEISURE BAL

German translation of Bright Shark
DKL Location: GENERAL PS3552.A467 B71 1994

German translation of Bright Shark.


NPS/DKL Location: BUCKLEY PS3503.E2 R9 1955


NPS/DKL Location: BUCKLEY PS3503.E2 R9 1985

(Curley large print). 552 p.

German translation of Run silent, run deep.

Hungarian translation of Das Boot.


Polish translation of Das Boot.

Polish translation of Das Boot.

________. **Podmornica**. Založba Lipa, 1975. 680 p.
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Czech translation of Das Boot.

French translation of Das Boot.

Spanish translation of Das Boot.

Finnish translation of Das Boot.

Danish translation of Das Boot.

Swedish translation of Das Boot.

English translation of Das Boot.

Italian translation of Das Boot.

Japanese translation of Das Boot.


German translation of The hunt for Red October.

German translation of The Hunt for Red October.

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German translation of the Hunt for Red October.

German translation of the Hunt for Red October.

French translation of The hunt for Red October.

French translation of The Hunt for Red October.

Russian translation of The hunt for Red October.


English translation of Im Krebsgang.
Recounts refugee family from the sinking of the Wilhelm Gustloff.

Originally published as "Im Krebsgang". Gottingen: Steidl Verlag, 2002.
This English translation first published Orlando: Harcourt, 2002.

French translation of Im Krebsgang.

Serbian translation of Im Krebsgang.


English translation of Zagadka Y-137
In 1981 Soviet sub U-137 ran aground near the Swedish naval base at Karlskrona

German translation of Zagadka Y-137.

Swedish translation of Zagadka Y-137

SUBMARINES -- GENERAL -- NUCLEAR

German translation of Submarine: a guided tour inside a nuclear warship.

NPS/DKL Location: GENERAL V857.5 .C55 1993


NPS/DKL Location: GENERAL V63.C7 A3 2001

NPS/DKL Location: GENERAL VM774 .C9


Abstract: This thesis compares the development of fleet ballistic missile systems in the United States and Soviet Union and their contribution to the achievement of national security objectives of each nation. To this end, submarine and missile technologies, elements of operational practices and support, and general strategic doctrine, are traced. A comparative assessment of weapon system effectiveness and potential in achieving stated objectives is derived from capabilities, peacetime employment, and wartime plans as stated in open doctrinal documents.
NPS/DKL Location: THESIS F5797

NPS/DKL Location: REFERENCE  VM317  .N38 1993


Chinese translation of Nihonkai kyofu no sensuikan senso


________ and ________, eds.. *Remaining issues in the decommissioning of nuclear powered vessels*. (Proceedings of the NATO/Russian Advanced Research Workshop on Scientific Problems and Unresolved Issues Remaining in the


Abstract: In July 1998, Britain published its Strategic Defense Review (SDR). The SDR outlined significant changes for Britain's nuclear weapons program and formalized the policy of sub-strategic deterrence using the Trident missile. It is unprecedented for a nuclear power to have consolidated its strategic and sub-strategic nuclear forces into a single system. The benefits offered by the British choice might be enjoyed for only a short time. The British have slashed their nuclear forces and eliminated the range of options previously available to their national command authority. Dependence on a single delivery system could result in the inability to respond to crises, to act autonomously, or to negotiate effectively with other nuclear weapon states. This thesis analyzes the benefits that nuclear Tomahawk could provide the British. Since the United States owns the system, the future of the nuclear Tomahawk in the American arsenal is crucial to any British decision to adopt it or a similar system. An unmanned nuclear cruise missile weapon offers many advantages in today's security environment. The United States should retain nuclear Tomahawk and Britain, with its mature maritime force, should consider acquiring a similar capability. The elimination of nuclear Tomahawk from the U.S. arsenal would be a mistake.

NPS/DKL Location: THESIS R3686
Electronic access: http://handle.dtic.mil/100.2/ADA359545


Proceedings of the NATO Advanced Research Workshop on Analysis of Risks Associated with Nuclear Submarine Decommissioning, Dismantling, and Disposal, Moscow, Russia, November 24-26, 1997.
NPS/DKL Location: GENERAL V857.5 .A53 1999


Contents: Bombers -- Intercontinental ballistic missiles -- Submarines -- Command, control, and communications (c3) -- The 21st century.


Papers of a symposium held in Racine, Wis., Nov. 1972 organized by the Carnegie Endowment for International Peace and the American Academy of Arts and Sciences under the sponsorship of the Johnson Foundation and the Alfred P. Sloan Foundation.
NPS/DKL Location: GENERAL V993 .F9


NPS/DKL Location: GENERAL V210 .W53

English translation of: The submarine: the ultimate weapon


SUBMARINES -- GENERAL -- WWI


NPS/DKL Location: GENERAL VM365 .D6


NPS/DKL Location: GENERAL D580 .G4

Thesis (Ph.D.), Columbia University, 1935.


**SUBMARINES -- GENERAL -- WWII**


English translation of I sommergibili della seconda guerra mondiale.
NPS/DKL Location: REFERENCE V857 .B25


German translation of Submarines of World War Two.


Cope, Harley Francis and Walter Karig. **Battle submerged; submarine fighters of World War II.** [1st ed.]. New York, Norton, [1951]. 244 p.


Pearsall, G. H. **The Effects of World War II Submarine Campaigns of Germany and the United States; A Comparative Analysis.** Newport, RI: Naval War College; Available from National Technical Information Service, Springfield, VA, , 1994. 43 p. Abstract: The effectiveness of the German and United States submarine campaigns during World War II is compared by analyzing the genesis of each campaign, the commitment to each and the effort to overcome the losses imposed by submarine warfare. This comparison highlights one aspect of the strategic and operational consequences of conflict with an adversary able to build and maintain a superior industrial base
in support of the military effort. This analysis places primary focus on German U-boat efforts in the Battle of the Atlantic and the U.S. submarine efforts in the Western Pacific. Ultimately, the overriding factor in the outcomes of both campaigns was the ability of the United States to produce more ships than the Germans could sink, to build more submarines than the Japanese could sink, and to sink more Japanese ships than the Japanese could build. As a result, the United States was able to sustain its total military effort against Germany; Japan was not able to sustain its efforts in the Pacific.

NPS/DKL Location: MICROFORM ADA283407


NPS/DKL Location: BUCKLEY D772.S4 R6


NPS/DKL Location: GENERAL D780 .R56 1997


NPS/DKL Location: GENERAL D780 .R5713 1999


NPS/DKL Location: GENERAL D780 .U55 1946


NPS/DKL Location: GENERAL D767.9 .V36 1991

NPS/DKL Location: GENERAL V210 .W5


**SUBMARINES -- AMERICAN – GENERAL**

NPS/DKL Location: GENERAL V858 .A48


Barrows, Nathaniel A. **Blow all ballast! The story of the Squalus.** New York, Dodd, Mead & Company, 1940. 298 p.
NPS/DKL Location: BUCKLEY VA65.S7 B2

NPS/DKL Location: GENERAL VA65.T48 B3


Abstract: The Navy's peacetime mission is "to conduct forward presence operations to help shape the strategic environment by deterring conflict, building interoperability, and by responding, as necessary, to fast breaking crises with the demonstration and application of credible combat power." (OPNAV INSTRUCTION 3501.316, February 1995) The ability to carry out this mission hinges on the Navy's ability to maintain ships and submarines forward deployed in regions where such crises may occur. The end of the Cold War and current budget constraints have caused a drawdown in the number of ships and submarines with which to provide forward presence. Coupled with the continued requirement to maintain a certain level of forward presence, this drawdown creates shortfalls when attempting to deploy ships or submarines to fill certain mission requirements. To minimize these shortfalls, this thesis formulates the problem of scheduling attack submarine deployments as an integer program. Due to its size and complexity, heuristic algorithms are developed to provide near-optimal solutions in a reasonable amount of time. In addition to providing near-optimal deployment schedules, results from the algorithms are also useful in evaluating changes in maintenance and operational policies.


Cable, Frank T. The birth and development of the American submarine. NY; Lond.: Harper, 1924. 337 p.


The Squalus rescue.


________.  **Submarine warfare; men, weapons, and ships.**  New York, Coward-McCann, [1967].  48 p.


Electronic access:  [http://web.mit.edu/ssp/](http://web.mit.edu/ssp/)


NPS/DKL Location:  GENERAL  V63.C7 A3 2001

NPS/DKL Location:  GENERAL  V210 .C9

NPS/DKL Location:  REFERENCE  V858 .C76 2003

NPS/DKL Location:  BUCKLEY  V858 .F75 1994

NPS/DKL Location:  BUCKLEY  V858 .F75 1995

NPS/DKL Location: BUCKLEY CT18.I52 G67 2000

Abstract: The naval force structure proposed by the 1993 Department of Defense 'Bottom Up Review' was analyzed in terms of three force planning cases built around illustrative scenarios using representative depictions of future threats. Each case included: regional analysis in terms of mission, forces, area, and command and control; development of military requirements; and comparison of requirements and capabilities, identification of shortfalls, and characterization of risk. A notional U.S. carrier battle group and air wing for the year 2000 were examined in scenarios involving a conventional global war with a reconstituted Russia, a major regional contingency on the Korean peninsula, and a lesser regional contingency involving a freedom of navigation dispute with Indonesia. The scenarios represent different levels from the spectrum of conflict. The future naval force was found insufficient to ensure victory in global conventional war, the scenario which involved the greatest risk to U.S. interests. The future force, optimized for blue-water operations, was also shown seriously deficient in countering mines and diesel submarines, another threat which entailed the potential for damage to U.S. interests.
NPS/DKL Location: MICROFORM ADA284646

Published in association with the Naval Submarine League.
NPS/DKL Location: FOLIO V858 .U55 2002

Abstract: The end of the Cold War has been the watershed event for changes in the international and national security environments that present tremendous implications for the US submarine force. These changes include calls for significant US defense cuts to reap a peace dividend, the increasing importance of economics as a determinant of defense spending, and the disintegration of the Soviet Union resulting in the absence of a clear tangible global threat to US national interests. What has resulted from these chances is the formulation of a new US national security strategy that focuses on regional contingencies, and the decision to cut US defense forces by at least 25% over five years including the cancellation of the Seawolf submarine program. This thesis addresses the implications of these tremendous changes on the US submarine force. Specifically, issues that are addressed include roles and missions, force structure, submarine design, and changing the institutional mindset of the submarine community. The issue of roles and missions involves demonstrating the applicability of the submarine to regional warfare. The issue of submarine force structure deals with both the short term and long term factors affecting submarine force reductions and ultimate submarine force size. The issue of submarine design addresses concerns over the submarine industrial base, the Centurion program, and design requirements for a regional warfighting submarine.


Abstract: This report summarizes Phase I of a study entitled Training Benefit Analysis of the Accelerated Use of Interactive Electronic Technical Manuals (IETM's). An initial evaluation of the interactive, computer controlled display of technical information has been carried out by the Navy training community. Results indicate the use of IETM's, integrated with automated courseware, could significantly improve training processes. Forty-seven candidate projects covering surface, air and submarine warfare areas were identified. Fifteen IETM hypotheses and associated implementation scenarios were evaluated. Of these, twelve were supported by more than two-thirds of the participants in this study. Candidate projects were identified for business-case-analyses to be performed in Phase II. This report also identifies technical and administrative issues which must be addressed before the full potential of IETM's can be realized. Measures needed for greater integration, infrastructure support and standardization of IETM's in training are recommended. Phase II of the study will consist of a more detailed analysis of the selected candidate projects, particularly from the standpoint of return on investment. This will provide the Chief of Naval Operations with the basis for training input to the Program Objective Memorandum (POM) '98 preparation process.

Electronic access: http://handle.dtic.mil/100.2/ADA309992


NPS/DKL Location: GENERAL V857.5 .L43 1999

NPS/DKL Location: GENERAL CT12.O23 A2


NPS/DKL Location: GENERAL VA65.S68 M33 1999

Abstract: The current military/political climate of budget cuts, downsizing, the demise of the Soviet Union, and the establishment of a new world order has forced all services to reexamine and justify their existence. I will specifically examine what U.S. submarine has to offer in the defense of America in relation to the National Military Strategy, to include deterrence, forward presence, crisis response and reconstitution; enduring characteristics which include stealth, endurance and agility; critical roles such as peacetime engagement, surveillance, deterrence, regional sea denial, precision strike, task group support, ground warfare support and battlespace dominance; and contributions that the submarine can make to the post-Cold War era. While there is no possible way to predict where or when the next conflict will occur, the submarine possesses valuable attributes which can be successfully utilized at the operational level to enhance the mission and achieve success.
NPS/DKL Location: MICROFORM ADA293371

NPS/DKL Location: FEDDOCS D 201.2:SU 1

Abstract: With the Navy’s shift in focus from blue water operations to littoral warfare, significant effort has been expended toward developing operational concepts that optimize the employment of naval forces, with the emphasis being placed on the Naval Expeditionary Task Force (Carrier Battle group and Amphibious Ready Group). Submarines play a key role in tactical operations within the battle group, but also have the potential to have a significant impact on the operational level of war, if properly utilized by the theater CINC. In order to get the most out of the submarine force, the CINC must balance operational tasks with the tactical needs of the CJTF. If the CINC allows the CJTF to control the SSNs to conduct littoral warfare tasks, he is forfeiting some of his operational flexibility. By viewing the JTF as a unit operating at the operational/tactical level, the CINC can better focus on tasks that need to be accomplished at the operational level. Employment of SSNs at this level of warfare can fill the gap that has been left by the Navy’s concentration on littoral warfare. Emphasis on the development of doctrine for littoral warfare need
to focus on the value of the SSN at all levels of warfare. Proper integration at all levels will result in maximum flexibility and will restore blue water Navy capabilities to the theater commander.

NPS/DKL Location: MICROFORM ADA312180

Navy times. They fought under the sea; the saga of the submarine [compiled by the editors of Navy times]. Harrisburg, PA, Stackpole Co., [1962]. 184 p.
NPS/DKL Location: GENERAL V210 .N3

Norris, David Thomas. Strategic planning, Polaris, and Tomahawk: technological imperative hypotheses. Monterey, CA: Naval Postgraduate School; Available from National Technical Information Service, Springfield, VA, 1987. (ADA193027). 126 p. Thesis (M.A. in National Security Affairs)--Naval Postgraduate School, 1987. Abstract: This thesis examines the force procurement element of the military strategic planning process and is comprised of two parts. First, models are constructed to depict ideal strategic planning. The initial step in each model is the formulation of the national interest. The national interest is defined in terms useful to strategic planners by creating a unique paradigm based on the Constitution. The technological imperative hypothesis is explored as an aberration to the ideal strategic planning process. Second, the technological imperative hypothesis is tested with case studies of the Polaris and the Tomahawk. Even though the hypothesis was disproved in each case, the case studies yielded useful relationships between technology, strategy, and doctrine.
NPS/DKL Location: THESIS N885


NPS/DKL Location: GENERAL V858 .P59 1983

NPS/DKL Location: GENERAL V858 .P7

NPS/DKL Location: GENERAL VA65.T7 P7

NPS/DKL Location: GENERAL CT18.I52 P64 1982

NPS/DKL Location: GENERAL VM1 .L25 P65 1999

NPS/DKL Location: GENERAL V858 .R3
Rodengen, Jeffrey L.  
**Serving the silent service: the legend of Electric Boat.** Fort Lauderdale, FL: Write Stuff Syndicate, c1994.  176 p.
NPS/DKL Location:  ON-ORDER

Sakitt, Mark.  
"An Occasional Paper of the Center for International Security and Arms Control."
NPS/DKL Location:  GENERAL  V210 .S24 1988

Smith, Carole J.  
Abstract:  
*In any future conflict, the U.S. Navy will most likely enjoy a significant technological and numerical superiority over its adversary. A relatively small navy may, however, avoid decisive battle and influence events at sea indefinitely. Naval strategists have coined the terms fleet in being, fortress fleet, and risk fleet to describe strategies designed to use inferior forces to an advantage. Through an examination of these strategies as analyzed by both Alfred Thayer Mahan and Julian Corbett and study of historical examples of each, the relevance of these strategies to current naval thought can be determined. While fortress fleet and risk fleet have very limited value today, a diesel submarine fleet in being poses a significant threat that must be addressed in future U.S. naval strategy.*
NPS/DKL Location:  MICROFORM  ADA293409

Snider, Don M., ed.  

Sontag, Sherry and Christopher Drew.  
NPS/DKL Location:  BUCKLEY  VB231.U54 S65 1998

________ and __________.  

________ and __________.  
German translation of Blind man's bluff.

Soto, Alberto A.  
Abstract:  
The problem of detecting an enemy submarine whose possible position was revealed by the hit of a torpedo is known as the "Flaming Datum" problem. All previous studies devoted to this theme make unrealistic assumptions about the speed of the escaping target when dealing with a diesel-electric submarine. In this kind of submarine the constraint imposed by the remaining charge of its batteries determines that its behavior is essentially conservative in how fast it should escape. The objective of this thesis is to explore the idea of varying speed in the flaming datum problem. Two different approaches are considered. An analytical model is developed based on the relationship among some of the physical factors...
that could determine or constrain the behavior of a diesel submarine while escaping from the area of the
flaming datum. The second approach considers a discrete event simulation using the Java-based Simkit
package. Data analysis is used to determine a possible fit for the simulation results. Several tactics are
explored to determine their effects on detection probability.
NPS/DKL Location: THESIS S66611635
Electronic access: http://handle.dtic.mil/100.2/ADA379766

Stambler, Irwin. The battle for inner space; undersea warfare and weapons. New
NPS/DKL Location: GENERAL V210.S695 1962

Steele, George P. Seadragon: Northwest under the ice. [1st ed.]. New York, Dutton,
NPS/DKL Location: GENERAL VA65.S43 S7

NPS/DKL Location: BUCKLEY D783.S73 1979

Stumpf, David K. Regulus, the forgotten weapon: a complete guide to Chance
NPS/DKL Location: GENERAL UG1312.C7 S78 1996

Terzibaschitsch, Stefan. Submarines of the US Navy [translated by M.J. Shields].

German translation of Submarines of the US Navy.

Thompson, Roger. Brown Shoes, Black Shoes, and Felt Slippers: Parochialism and
the Evolution of the Post-War U.S. Navy. Newport, RI: Naval War College; Available
Abstract: This report examines how intra-service parochialism has affected the United States Navy since
the end of the Second World War. It traces the development of naval bureaucratic dominance from the
prewar battleship admirals, through the rise of naval aviators to the eventual dominance by nuclear
submariners. The author posits that the Navy may now have entered a new era once again dominated by
surface warfare officers and wonders what the consequences of this change may be. The study argues for
balance and urges naval leadership to rise above the natural tendency to square the past by primarily
promoting the interests of the dominant warfare group.
NPS/DKL Location: MICROFORM ADA299970

Tritten, James John. The submarine's role in future naval warfare. Monterey, CA:
Naval Postgraduate School; Springfield, VA: Available from National Technical
Abstract: The three basic elements where we traditionally commence strategic planning have changed
dramatically in the past two years. A new national security strategy recasts the roles and missions of the
armed forces in new terms. The submarine force needs to be justified under the new grammar for warfare as a part of the four new mission areas under the new national military strategy. The submarine force alone can perform the strategic deterrence and defense missions. The submarine's role in presence involves a high/low mix choice. There should be increased emphasis on the submarine force for crisis response: (1) rapid response (2) shore bombardment and strike (3) as the initial leading maritime component for second major regional contingencies, and (4) initial and limited sea control. A European regional war evolving out of a major regional contingency is not the same thing as the old European-centered global war with the USSR. Decreased emphasis should be placed on strategic anti-submarine warfare. Reconstitution goals could be met with at-sea nuclear weapons.

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-NS-92-010


NPS/DKL Location: GENERAL V857 .R46 1998


NPS/DKL Location: FEDDOCS GA 1.13:01-493
Electronic access: http://purl.access.gpo.gov/GPO/LPS12498


NPS/DKL Location: GENERAL V858 .U3


NPS/DKL Location: GENERAL VA68,K4 U6


NPS/DKL Location: GENERAL VA65.T7 T5


NPS/DKL Location: GENERAL VK1265 .U6
Abstract: This report contains summaries of the research performed at the Marine Physical Laboratory. Brief descriptions of the research and bibliographies of the publications resulting therefrom are included. The general areas of our research include: Ocean Environmental Acoustics, Marine Physics, Marine Geophysics, Signal Processing, Ocean Technology, Platform Development and Support, and Technical Assistance and Technology Transfer.
NPS/DKL Location: MICROFORM ADA220008

NPS/DKL Location: GENERAL V858 .W45 1991

NPS/DKL Location: GENERAL V858 .W46 1993

NPS/DKL Location: GENERAL V858 .W55 1998

NPS/DKL Location: GENERAL QA911 .P49 1997

SUBMARINES -- AMERICAN -- KOREAN WAR

Abstract: United States submarine operations during the Korean War are critically analyzed from an operational perspective. The Korean War represented a prototype for future Major Regional Conflicts (MRCs). Examining the Operational Commander's use of submarines against a relatively weak naval power, in a conflict dominated by land battle, provides lessons which may be applicable to future MRCs. Brief historical and operational overviews are followed by operational analyses of submarine command and control, operational reconnaissance missions, and the war's impact on the submarine force. Conclusions discuss lessons learned for present and future operational planning. Compared to their significant contribution during World War II, U.S. submarines did not play a major role in Korea. Their employment was mostly directed towards training and reconnaissance operations. Korean War operational reconnaissance set the stage for submarine operations throughout the Cold War. Submarine employment in the Korean War was affected by three key issues: difficulty in preventing blue-on-blue engagements, communications limitations which inhibited rapid, reliable submarine operational tasking, and defensive mining of the littoral region. These three issues will continue to challenge operational Commanders when employing submarines in future MRCs.
NPS/DKL Location: MICROFORM ADA279727
Cagle, Malcolm W. and Frank A. Manson. The sea war in Korea. Annapolis, [MD]: United States Naval Institute, c1957. 555 p.
NPS/DKL Location: GENERAL DS920.A3 C2

NPS/DKL Location: GENERAL DS920.A3 F4

A shorter version appeared in the Saturday Evening Post as "Miracle under the Arctic sea."
NPS/DKL Location: BUCKLEY V858 L4

NPS/DKL Location: CIRCDESK DS920.A2 C3 2000

NPS/DKL Location: GENERAL V63.S38 A3 1988

SUBMARINES -- AMERICAN -- NUCLEAR


NPS/DKL Location: GENERAL VA65.N3 A6


NPS/DKL Location: GENERAL VG93 B2

NPS/DKL Location: GENERAL CT18 .I522 D86 1990

NPS/DKL Location: GENERAL V63.R63 D86 2001


Abstract: How can nuclear powered submarines (SSNs) contribute to joint force protection? Are these submarines essential to a joint force commander’s concept of operations? Would their absence significantly alter his branch and sequel plans? Although SSNs represent a significant combat capability, do they possess the necessary range of capabilities to enhance operational protection in a given theater? SSNs can be a force multiplier in the right scenario. ‘The modern attack submarine is a versatile multi-mission warship that is more survivable than any other naval vessel in history.’ However, just as the special operating forces complement ground troops, SSNs complement the naval forces. SSNs can not accomplish all tasks all the time, but the capabilities they bring to joint force operations can free other forces to act in contributing areas to accomplish the overall mission. This is their forte. The principle missions submarines can perform have grown tremendously from the pre-World War II tasks. These tasks included covert strike warfare, surface warfare, undersea warfare, intelligence collection and surveillance, covert indication and warning, electronic warfare, special warfare, covert mine warfare, and battlegroup support. With so many capabilities available, the operational commander must rely on doctrine to incorporate these tasks into his concept of operations. This paper will attempt to articulate the fundamental principles to guide the use of SSNs in warfare. Just as air superiority against an adversary requires phasing of operations, so does undersea superiority. Submarines can best combine time and space with stealth to help prepare the littoral battlespace for future operations.
NPS/DKL Location: MICROFORM ADA328103

Kuenne, Robert E. **The Polaris missile strike; a general economic systems analysis.** [Columbus]: Ohio State University Press, [1967, c1966]. 434 p.
The third volume to emerge from the General Economic Systems Project at Princeton University.
NPS/DKL Location: GENERAL V993 .K9

NPS/DKL Location: GENERAL V857 .L29 1991


Abstract: By 2012, the reactor on the U.S. Navy's only deep-diving research submarine will be exhausted, making it necessary to either refuel the reactor or replace the submarine. If the Navy opts for a new submarine, what capabilities should it retain and what capabilities should be added? What would be its most important missions and what would be required for it to perform those missions? In this report, the authors worked with panels of qualified scientists, defense experts, and naval officers to develop a concept of operation for a possible replacement platform, analyzing which military and scientific missions should have the highest priorities. The authors conclude by offering a list of the highest-priority missions and two design concepts that would best be able to achieve them.

NPS/DKL Location: GENERAL V857.5.C65 200
Electronic access: http://www.rand.org/publications/MR/MR1395/


NPS/DKL Location: GENERAL V858.P7

NPS/DKL Location: GENERAL VA65.T7 P7

NPS/DKL Location: GENERAL V858.R3

NPS/DKL Location: GENERAL CT18.I52 R62 1992


NPS/DKL Location: GENERAL V993.S2

German translation of Nautilus 90 north.


Revision of author's thesis (Ph.D.) -- University of Edinburgh.

NPS/DKL Location: GENERAL V993 .S65 1994


Abstract:  *This paper opens with an examination of existing legal restraints on naval forces and arms control agreements and concludes that the U.S. is already heavily engaged in naval arms control. Given the new international security environment and the new U.S. regionally-oriented national security and military strategies, the author then recommends a series of additional naval arms control measures that should be taken: exchanges of data, transparency, INCSEA, cooperative measures, an agreement on the laws of submarine warfare, abolishing NCND, no first tactical nuclear use at sea, NWFZs, advanced notification of operational-level exercises, environmental protection measures, controls over maritime technologies, armed escorts of nuclear shipments, new Roes, PALs, the resolution of outstanding political issues at sea, deep cuts in nuclear forces, CFE follow-on, limits on specific types of naval forces, geographic limits, expanded standing naval forces, and a re negotiation of the ABM Treaty. The paper then addresses verification and compliance issues. Author concludes that since the U.S. Navy has already managed to avoid major arms control while balanced on the precarious 'slippery slope', there is no reason to continue its stonewalling policies.*

NPS/DKL Location: FEDDOCS D 208.14/2:NPS-NS-92-016


NPS/DKL Location: FEDDOCS Y 4.M 53:97-47


NPS/DKL Location: FEDDOCS Y 4.SE 2/1 A:995-96/16

NPS/DKL Location: GENERAL KF26 .S20 V.103 NO.4

NPS/DKL Location: FICHEDOCS Y 10.2:AT 8
Electronic access: [http://www.cbo.gov/showdoc.cfm?index=3312&sequence=0&from=1](http://www.cbo.gov/showdoc.cfm?index=3312&sequence=0&from=1)

NPS/DKL Location: FEDDOCS GA 1.13:NSIAD-95-16

NPS/DKL Location: GENERAL V993 .U63

NPS/DKL Location: GENERAL V993 .F35 1996

NPS/DKL Location: GENERAL V993 .F35 1982

NPS/DKL Location: GENERAL V993 .F35 1990


Abstract: For operational commanders, the use of military force today requires flexibility, efficiency, and careful risk management among joint forces. In light of these requirements, this paper examines the influence of the fast attack nuclear submarine (SSN) and the Joint Force Commander's (JFC) employment of SSNs as an operational-level asset. The history of submarine warfare provides many lessons regarding submarine employment. Although the JFC can use submarines to accomplish or support a broad scope of missions, optimum employment requires analysis of the characteristics, capabilities, and expertise of submarines. The intrinsic and enduring characteristics of the SSN are stealth, mobility, endurance, and flexibility. The SSN also possesses diverse capabilities that allow it to perform a number of missions in support of the operational commander. These include theater ISR, support of ground components and operations ashore, and attacks on sea-based threats and objectives. Matching the submarine's characteristics with these capabilities yields several employment principles. For the JFC, SSNs are flexible assets that are best employed operationally deep where autonomous, survivable, or enabling forces are required. As an operational asset, the SSN contributes directly to several of the JFC's operational functions. First, submarines are important to the JFC because of their role in operational intelligence. Because of their stealth and forward positions, SSNs are able to conduct ISR directed at the enemy's operational weaknesses and centers of gravity. Second, the SSN's mobility and endurance enable it to execute operational maneuver. Third, through their USW, SUW and MIW capabilities, SSNs provide superb operational protection of naval forces. Finally, the SSN's extensive operational reach and autonomy make it particularly effective at conducting operational fires. Effective employment of SSNs will help the JFC achieve leverage and freedom of action in the theater.

Electronic access: http://handle.dtic.mil/100.2/ADA348604


SUBMARINES -- AMERICAN -- PERSIAN GULF WAR

NPS/DKL Location: REFERENCE DS79.72 .B76 1993

NPS/DKL Location: FEDDOCS D 221.2:G 95


NPS/DKL Location: GENERAL DS79.744 .N38 P65 1999

NPS/DKL Location: GENERAL DS79.72 .U55 1991
SUBMARINES -- AMERICAN -- WWI

NPS/DKL Location: GENERAL D619 .B3

Battey, George Magruder. 70,000 miles on a submarine destroyer; or, The Reid boat in the world war. Atlanta, The Webb & Vary company, 1919. 384 p.
NPS/DKL Location: BUCKLEY D589.U6 B3 1919

NPS/DKL Location: GENERAL D589.U6 L5


NPS/DKL Location: BUCKLEY D589.U6 S6 1920

NPS/DKL Location: GENERAL D589.U6 S6 1984

Originally published: New York: Sheridan House, [c1937] as Take her down, a submarine portrait.
NPS/DKL Location: GENERAL D595.U3 T4

NPS/DKL Location: GENERAL D589 .U545 1923
SUBMARINES -- AMERICAN -- WWII

NPS/DKL Location: GENERAL D783.A54 1989

NPS/DKL Location: BUCKLEY VM365.B2

Reprinted mostly from articles published in the Connecticut Circle magazine.

Reprinted mostly from articles published in the Connecticut Circle magazine.

Reprinted mostly from articles published in the Connecticut Circle magazine.

NPS/DKL Location: GENERAL CT2.E44 A3 1999

NPS/DKL Location: BUCKLEY D783.5.T7 B3


French translation of Submarine


French translation of Submarine


Abstract: *This paper analyzes the United States use of unrestricted submarine warfare against the Japanese in World War II. Within the framework of the principles of war, the paper critically analyzes the strategy of the use of submarines during the war and how the operational strategy changed during the course of the war. This paper also critically surveys the use (or misuse) of the key tenets of modern, fundamental military thought. Recommendations and observations are offered which are considered applicable to modern warfare.*

NPS/DKL Location: MICROFORM ADA253241


**USS Bowfin**


NPS/DKL Location: GENERAL D783.B6


Briggs, Raymonde. **The super submarine, the only vessel now capable of safely carrying and servicing a sixteen inch gun.** [Bogota, NJ, The Dancey printing company, 1942]. 20 p.

Discussion of a proposed new submarine with sixteen inch gun, invented by N. M. Hopkins.


NPS/DKL Location: GENERAL D782.J33 C35 1995
NPS/DKL Location: GENERAL D783.5.S8 C2


NPS/DKL Location: BUCKLEY D783 .C3


NPS/DKL Location: GENERAL D783.5 .G73 C55 1999


Abstract: The Battle for Leyte Gulf was the greatest naval battle of all time in terms of number of ships involved, losses of ships and aircraft and size of area over which the battle was fought. The American victory effectively marked the end of the Japanese Navy in World War Two. The battle was marked by furious surface, air and submarine action at sea and fierce fighting ashore on Leyte Island by US Army and Marine ground forces. While U.S. Navy dealt devastating losses to the Japanese fleet and claimed a resounding victory, the battle continues to be discussed for the significant operational, tactical and judgmental errors made by commanders of both sides. This study examines the errors made, the reasons for the errors and the effect the errors had toward deciding the outcome of this battle. It investigates the Japanese plan for the battle and the Japanese philosophy toward the war in 1944 and how these issues affected the outcome. It also considers the American chain of command in the Pacific theater and the problems caused by that unique setup. The paper discusses what we have learned, if anything from Leyte Gulf, and if in a similar situation would we make the same mistakes again. Finally the paper evaluates the composite effect of errors on both sides.
NPS/DKL Location: MICROFORM ADA209582
NPS/DKL Location: GENERAL D783.5.W3 D39 2000

Dienesch, Robert M. *Submarine against the rising sun: the impact of radar on the American submarine war in 1943, the year of change.* [Fredericton]: University of New Brunswick, 1996. 227 l.
Thesis (M.A.), University of New Brunswick, Dept. of History 1996.

NPS/DKL Location: GENERAL D777.5 .A92 D56 1997

NPS/DKL Location: GENERAL D783 .F22


NPS/DKL Location: GENERAL D783.5 .B36 F58 1992

NPS/DKL Location: GENERAL D783.5 .S4 F7


NPS/DKL Location: GENERAL V850 .G36 1996

NPS/DKL Location: FEDDOCS D 201.39:SU 1

NPS/DKL Location: GENERAL D783 .G8


**Abstract:** U.S. submarine operational failure led to tactical insignificance at the Battle of Midway. This was a remarkable outcome since interwar U.S. policy, submarine design, and fleet exercises dictated fleet
support by submarines. From today's view this failure is neither unique to a platform nor specific to an operation. It can and does cross all services. The operational failure at Midway resulted from the failure to abide by the operational art factors of synergy, simultaneity and depth, anticipation, and leverage. These were compounded by failure to provide adequate C3I system operational support. These failures were a consequence of the submarine force, and the Navy, not adequately addressing and training on operational art during the interwar years. Today, Navy doctrine and training still have not adequately addressed operational art though it is an essential part of joint warfare. The present use of exercises designed only to test and build tactical proficiency of air, land, or sea forces risk the same type of operational failure in future wars. Suggestions on developing operational art proficiency through innovation as a function of today's forces, budgets, and training technology are presented for consideration.

Electronic access: http://handle.dtic.mil/100.2/ADA311656


NPS/DKL Location: GENERAL V857.K28 1993


NPS/DKL Location: GENERAL D780.K56 1999

NPS/DKL Location: BUCKLEY D783.K56 1996

The Squalus is also indexed as Sailfish (Submarine).
NPS/DKL Location: GENERAL D783.L38 1994

NPS/DKL Location: GENERAL V63.C88 L39 2003

NPS/DKL Location: GENERAL D782.G76 L36 1998

Originally published: London, MacDonald, [1973].

NPS/DKL Location: BUCKLEY D783 .L6 1951

Russian translation of Sink 'em all.


NPS/DKL Location: GENERAL V858 .L8


NPS/DKL Location: BUCKLEY D780 .L8

_______. and ________. *Through hell and deep water; the stirring story of the Navy's deadly submarine, the U. S. S. Harder, under the command of Sam Dealey, destroyer killer*. New York, Greenberg, [1956]. 317 p.
NPS/DKL Location: BUCKLEY D783.5.H3 L8

NPS/DKL Location: BUCKLEY D769.45 .L8


NPS/DKL Location: GENERAL D783.M45 1990

NPS/DKL Location: BUCKLEY D790.M5


NPS/DKL Location: GENERAL D783.5.P4 M53 2000


NPS/DKL Location: GENERAL D783.M55 2000

NPS/DKL Location: RESERVE D773.M8 V.4


NPS/DKL Location: GENERAL D783.5.T35 O43

NPS/DKL Location: GENERAL CT15.K36 1989


NPS/DKL Location: GENERAL D743.5.P56 1991

194
NPS/DKL Location: BUCKLEY D783 .R7

Ruhe, William J. **Slow dance to Pearl Harbor: a tin can ensign in prewar America.** Washington: Brassey's, c1995. 210 p.
NPS/DKL Location: GENERAL D783 .R83 1995

_______. **War in the boats: my World War II submarine battles.** Washington [DC]: Brassey's, c1994. 303 p.
NPS/DKL Location: GENERAL CT18.U17 R83 1994


NPS/DKL Location: GENERAL D783.5.R37 S27 1995

NPS/DKL Location: GENERAL V63.S38 A3 1988

NPS/DKL Location: BUCKLEY D783.5.B8 S5


NPS/DKL Location: REFERENCE VA61 .S54 1987


NPS/DKL Location: GENERAL D783.5.C74 S63 2001

NPS/DKL Location: GENERAL D783 .S65 2003


NPS/DKL Location: BUCKLEY D783.5.C6 T4


NPS/DKL Location: GENERAL D783.5.S5 T8


NPS/DKL Location: GENERAL D783.O43 T86 2001


NPS/DKL Location: GENERAL D783 .U6


NPS/DKL Location: BUCKLEY D783 .U6 1949


NPS/DKL Location: GENERAL D783 .U62


History of the Gato, Balco and Trench class submarines


NPS/DKL Location: BUCKLEY VM365 .Z7

**SUBMARINES -- AUSTRALIAN -- GENERAL**


**SUBMARINES -- AUSTRALIAN -- WWI**

Australia. Navy Office. Directorate of Public Information. *The discovery of AE2*. [Canberra]: [Directorate of Public Information, Navy], [1998]. Includes information and photographs about the discovery and documentation of the wreck of the Australian submarine AE2 scuttled off the Gallipoli Peninsula, Turkey, during World War 1. The site includes underwater photography by research team leader Dr Mark Spencer.


**SUBMARINES -- AUSTRIAN -- GENERAL**


**SUBMARINES -- BRAZILIAN -- GENERAL**


**SUBMARINES -- BRITISH -- GENERAL**

NPS/DKL Location:  GENERAL  V767 .B83 2000

NPS/DKL Location:  GENERAL  VM365 .B9 V.1

NPS/DKL Location:  REFERENCE  V859.G7 C63 1982


Edmonds, Martin, ed.  *100 years of "the trade": Royal Navy submarines, past, present & future.*  Lancaster: CDISS, 2001. ([Bailrigg study; 6]).  262 p.


NPS/DKL Location:  BUCKLEY  V210 .K3


Sueter, Murray Fraser. The Evolution of the submarine boat, mine and torpedo from the sixteenth century to the present time. Portsmouth, J. Griffin, 1907. 384 p.

NPS/DKL Location: GENERAL V859.G7 T35 1996


SUBMARINES -- BRITISH -- WWI


By “Klaxon.”


Originally published: London: Hodder & Stoughton, limited, [1928].

Originally published: London: Hutchinson, [1930].
NPS/DKL Location: BUCKLEY D593 .C2


"Narrating the naval career of Commander Godfrey Herbert."

Sequel to author's work: Fighting the U-boats.
NPS/DKL Location:  BUCKLEY D593 .C38

NPS/DKL Location:  BUCKLEY D580 .C4

NPS/DKL Location:  BUCKLEY D593 .C4

NPS/DKL Location:  BUCKLEY D581 .C4


NPS/DKL Location:  GENERAL D594 .D44


Domville-Fife, Charles W.  Submarine warfare of to-day: how the submarine menace was met and vanquished, with descriptions of the inventions and devices used, fast boats, mystery ships, nets, aircraft, &c., &c., also describing the selection and training of the enormous personnel used in this new branch of the navy.  Philadelphia:  J.B. Lippincott co.; London:  Seeley, Service & Co., 1920.  303 p.

NPS/DKL Location: BUCKLEY V859.G7 E2

______. **We dive at dawn.** Chicago, The Reilly & Lee co. [c1941]. 412 p.

Originally published: London, Harrap, [1963].

NPS/DKL Location: GENERAL V859.G7 E83 1999

Contents: I. The cruiser period.--II. From the opening of the submarine campaign to the appointment of the shipping controller.--III. The period of unrestricted submarine warfare.
NPS/DKL Location: BUCKLEY D581 .F3 1920

NPS/DKL Location: GENERAL D591 .G4


______. **Germanskaia podvodnaia voina 1914-1918 gg.** 1938. 431 p.
Russian translation of The German submarine war, 1914-1918.


NPS/DKL Location: BUCKLEY D581 .J4


**SUBMARINES -- BRITISH -- WWII**


NPS/DKL Location: GENERAL VA454 .D45 1995

Bruce, Henry J. *Twenty years under the sea*. S. Paul, [1939]. 228 p.
NPS/DKL Location: BUCKLEY VM981 .B8

NPS/DKL Location: GENERAL D784.G7 B94

NPS/DKL Location: BUCKLEY D780 .C4

NPS/DKL Location: GENERAL D780 .C65 1982


NPS/DKL Location: GENERAL D784.G7 D52 1999


NPS/DKL Location: GENERAL VA458.A48 L36 1986


Originally published: London: MacDonald, [1972].

NPS/DKL Location: BUCKLEY V210 .L9

NPS/DKL Location: BUCKLEY D780 .M2


Sequel to Unbroken, the story of a submarine.


_______. **Unbroken, the story of a submarine.** London, F. Muller, [1953]. 223 p.
NPS/DKL Location: GENERAL D784.G7 M2
NPS/DKL Location: Buckley D780 .M3


German translation of The secret Capture.

Capture of the U-110, recommissioned as HMS Graph.

Simpson, George Walter Gillow. **Periscope view: a professional autobiography.**


NPS/DKL Location: BUCKLEY VA458.T46 W37 1958

NPS/DKL Location: GENERAL V859.G7 W2

NPS/DKL Location: GENERAL D784.G7 W2


NPS/DKL Location: GENERAL D784.G7 Y7


Originally published: London, R. Hart-Davis, 1952 as One of our submarines.

SUBMARINES – CANADIAN -- GENERAL

NPS/DKL Location: GENERAL V859.C3 F47 1995


**SUBMARINES -- CHINESE -- GENERAL**

NPS/DKL Location: GENERAL VA633 .L48 1994

**SUBMARINES -- DANISH -- GENERAL**


**SUBMARINES -- DUTCH -- GENERAL**


**SUBMARINES -- FRENCH -- GENERAL**


**SUBMARINES -- GERMAN -- GENERAL**

NPS/DKL Location: GENERAL V210.B67 MISSING


_______.

NPS/DKL Location: GENERAL VA513.G6813 1990

München: Bernard & Graefe, c1982-c1994. 8 v. in 10


NPS/DKL Location: GENERAL V859.G3 H33 1995

_______.


NPS/DKL Location: GENERAL D781.K46 1997

_______.


NPS/DKL Location: GENERAL V859.G3 T37 1989


NPS/DKL Location: GENERAL D591.T47 1989


NPS/DKL Location: GENERAL VC305.G3 W55 1995

SUBMARINES -- GERMAN -- WWI

Ajax, pseud. The German pirate; his methods and record. New York, George H. Doran company [c1918]. 124 p.


NPS/DKL Location: BUCKLEY D591.A7


_______. Sørøverens færd [tr. by Johan Warburg]. København, V. Pio, 1918. 84 p. Danish translation of The pirate's progress.


Contents includes Der U-books-krieg.

NPS/DKL Location: BUCKLEY D591 .C5

NPS/DKL Location: GENERAL D589.U6 C6


Ellis, Frederick D. The tragedy of the Lusitania: embracing authentic stories by the survivors and eye-witnesses of the disaster, including atrocities on land and sea, in the air, etc. [Philadelphia, PA?]: National publising co., 1915. 320 p.


English translation of Die verratene flotte. Aus den letzten Tagen der deutschen Kriegsmarine.


George, S. C. Jutland to junkyard; the raising of the scuttled German High Seas Fleet from Scapa Flow; the greatest salvage operation of all time. Cambridge, Stephens, 1973. 176 p.


Previous edition entitled: The log of a U-boat commander; or, U-boats westward -- 1914-1918. NPS/TKL Location: BUCKLEY D591.H3


________. *El 1. er viaje del submarino mercante "Deutschland"*. Buenos Aires, M. Schneider, 1918. 142 p.


NPS/DKL Location: BUCKLEY D592.D4 K7


NPS/DKL Location: BUCKLEY D592.L8 L3


English translation of Wir leben noch!


Originally published as From U-boat to pulpit, 1936.


NPS/DKL Location: BUCKLEY D591 .N6


Ramlow, Gerhard. **Ausgelaufen westwarts.** Potsdam, L. Voggenreiter, [c1937]. 143 p.


NPS/DKL Location: BUCKLEY D589.U6 R7


Selow-Serman, K. E. **U-Boot-Abenteuer im Sperrgebiet.** Berlin, A. Scherl, [c1917]. 112 p.


NPS/DKL Location: GENERAL D592.L8 S5


Spencer, Samuel R. **Decision for war, 1917; the Laconia sinking and the Zimmermann telegram as key factors in the public reaction against Germany.** Rindge, NH, R.R. Smith, 1953. 109 p.
Spiegel von und zu Peckelsheim, Edgar.  

The adventures of the U-202: an actual narrative.  

NPS/DKL Location:  BUCKLEY  D591 .S7

_______.  

Kriegstagebuch "U 202": angefangen den 12th. April 19..,  

abgeschlossen den 30th. April 19...  


_______.  

Kriegstagebuch U 202 und Oberheizer Zenne, der letzte Mann der Wiesbaden.  


_______.  

U. boat 202, the war diary of a German submarine [tr. by Captain Barry Domvile].  


_______.  

U-Boot im Fegefeuer.  

Berlin: Scherl, 1930.  211 p.  

_______.  

U-Boot im Fegefeuer.  

Berlin: Scherl, 1940.  211 p.  

_______.  


[2. Aufl.].  


Spindler, Arno.  

La guerra al commercio con i sommergibili [tr. Raffaele de Courten and Wladimiro Pini].  

Roma, Instituto poligrafico dello stato, Libreria, 1934-.  3 v.  

Italian translation of Der Handelskrieg mit U-Booten.  

_______.  

Der Handelskrieg mit U-Booten.  

Berlin, E.S. Mittler & Sohn, 1932-.  (Der Krieg zur See, 1914-1918).  v.  

Steinwager, Leonhard.  

U-boot, Englands tod!  


Stokes, Roy.  

Death in the Irish Sea: the sinking of the RMS Leinster.  


Termote, Tomas.  

Verdwenen in de Noordzee: geschiedenis van de Duitse U- 

botenaan de Belgische kust in de Eerste Wereldoorlog en opheldering over het 

lot van vijftien verdwenen onderzeeers.  


Thomas, Lowell.  

Raiders of the deep.  

NPS/DKL Location:  GENERAL  D591 .T4

_______.  

Raiders of the deep.  

NPS/DKL Location:  BUCKLEY  D591 .T4

_______.  

Ritter der Tiefe [ubersetzt und bearbeitet von C. Freiherr v. Spiegel].  

English translation of Raiders of the deep.

NPS/DKL Location: FEDDOCS AE 1.112/2:1

NPS/DKL Location: GENERAL D589.U5 A4 NO.1 1920


**SUBMARINES -- GERMAN -- WWII**


Alman, Karl [pseudo.] -- see Kurowski, Franz.


NPS/DKL Location: GENERAL D773.B17


English translation of Verdammte See.
NPS/DKL Location: GENERAL D771 .B44 1974

English translation of Verdammte See.


Originally published: [Oldenburg], G. Stalling, [c1971].


Bernig, Heinrich [pseud.] -- see Kurowski, Franz.

NPS/DKL Location: GENERAL D781 .B53 1996
Bibliographic information:


Originally published: Berlin  Suhrkamp, 1943.


English translation of So war der U-Boot-Krieg.

English translation of Deutschen U-Boot-Kommandanten.
NPS/DKL Location: GENERAL  CT32 .B87 1999


U-352, the sunken German Uboat in the graveyard of the Atlantic. 1st ed. [s.l.: E. Caram], c1987. 105 p.


Abstract: This paper will analyze World War II U-boat operations against Allied sealift with focus on the period from May 1943 to the end of the war. It will show the relevance of the operational and strategic decisions of this historical campaign to the challenges of today's potential regional conflicts. In 1943, Allied technological innovations and convoy employment precipitated a decline in U-boat successes and changes to the final portion of the U-boat campaign produced fewer U-boat victories, yet remained an effective operational scheme. It is relevant that the inability of Allied forces to consistently thwart successful U-boat attacks, along their own coastlines, emphasizes a weakness in our Naval Strategy Today, insufficient and usually lightly protected sealift. The Navy and Marine Corps joint White Paper, From the Sea, articulates Navy support of the National Security and National Military Strategies of the United States with a commitment to concentrate more on capabilities required in the complex operating environment of the 'littoral' or coastlines of the earth.

NPS/DKL Location: MICROFORM: ADA279488


English translation of Ali Cremer, U 333.


NPS/DKL Location: GENERAL D781.C7413 1984A


Abstract: The paper examines the Battle of the Atlantic from an operational rather than the usual strategic perspective. The impressive achievements of the small force of German submarines against such overwhelming odds was a direct result of Admiral Karl Doenitz's skillful practice of the Operational Art. An examination of his attributes and methods may provide useful guidance for the commander of the small, austere force of the future. Superior numbers or technology does not guarantee for military success. Sound doctrine, vision, operational excellence, initiative and audacity, on the other hand, can produce substantial advantages. The paper also cautions that the dramatic allied reconstitution which did so much to turn the tide in the Battle of the Atlantic, is unlikely to reoccur and that the large, costly multi-purpose
weapons platforms of today may be as ineffective in fighting the low intensity naval battle on the littoral as the large capital ships were in the Battle of the Atlantic.

NPS/DKL Location: MICROFORM ADA266796

Donitz, Karl.  **The conduct of the war at sea: an essay.**  Washington: Division of Naval Intelligence, 1946.  34 p.


English translation of La guerre en 40 questions.

Earlier editions published as Deutsche Strategie zur See im Zweiten Weltkrieg.


________.  **Deutsche Strategie zur See im Zweiten Weltkrieg; die Antworten des Grossadmirals auf 40 Fragen.**  Frankfurt am Main, Bernard & Graefe, 1970.  230 p.


English translation of Zehn Jahre und zwanzig Tage.

NPS/DKL Location: GENERAL D781.D6


________.  **Die U-Bootswaffe.**  Berlin: E. S. Mittler, c1939.  65 p.


_____. **Bis zur letzten Stunde: Illusion und Wirklichkeit.** Hamburg; Berlin; Bonn: Mittler, 1995. 223 p.


Abstract: Operation Paukenschlaq, a German U-boat operation against Allied shipping along the East Coast of the United States and Canada in early 1942, is analyzed from the perspective of the operational level of war. The plan and its execution are examined to provide conclusions and lessons learned for future operational planning considerations. Chapter One provides a short historical summary of the German U-boat Force and the Battle of the Atlantic. Chapter Two analyzes the operational design of Paukenschlag. Chapter Three discusses the execution of the operation. Finally, Chapter Four offers information from the operation which could be useful for future commanders. This analysis of Operation Paukenschlag shows that an operation conceived, planned, and executed in as short as time as Paukenschlaq was, can be successful, provided several critical factors prevail.

NPS/DKL Location: MICROFORM ADA279625


NPS/DKL Location: BUCKLEY D780 .F7


English translation of Die Wölfe und der Admiral.

NPS/DKL Location: BUCKLEY D781 .F7


Abridged English translation of Die Wölfe und der Admiral.


NPS/DKL Location: GENERAL D781.G36 1990

German translation of *Operation Drumbeat*.

German translation of *Operation Drumbeat*.

German translation of *Operation Drumbeat*.

German translation of *Black May*.


Jochen Mohr and the U-124.


Abstract: German submarine operations against allied convoys, during March 1943 is critically analyzed from an operational perspective. The theater commander's operational scheme is dissected for the purpose of identifying lessons which can be applied to the planning and execution of today's theater operations. A brief historical account of the early phases of the war and the events and decisions which preceded the critical convoy battles will be followed by an analysis of the operational scheme employed by Admiral Doenitz. German victory during the spring offensive clearly demonstrated numerous operational successes, a reasonably well conceived operational plan, and proof positive of the potential for a larger scale victory, yet history recorded Germany's ultimate defeat in the Battle of the Atlantic. This analysis identified three significant flaws which led to the German demise; first, strategic guidance and operational means were inadequately reconciled.

NPS/DKL Location: MICROFORM ADA264185


German translation of U-boats against Canada


German translation of U-boats against Canada


Abstract: This paper reviews the specific segments of the Battle of the Atlantic that were conducted in and around the Caribbean Sea. The background information explores Germany’s political goals and policies in the years prior to the second world war, and the military situation that resulted. The Battle of the Atlantic is reviewed to determine the reasons for sending U-boats to the Caribbean theater, which was at the effective limit of their operational endurance. Further, the operational art aspects of the use of U-boats in the Caribbean theater and the results they achieved are examined in detail. The subsequent withdrawal of U-boats from the Caribbean after only eleven months in the theater is specifically evaluated in light of the personal leadership and operational art abilities of the Command in Chief of the U-boat Arm, Admiral Karl Doenitz. The paper’s conclusion is an evaluation of the title question. Despite the acknowledged tactical success of sinking 400 merchant ships, with the loss of only seventeen U-boats, the author concluded that the Germans did not exploit all available opportunities that may have allowed them to achieve an even greater operational success in the prosecution of the Battle of the Atlantic.

NPS/DKL Location: MICROFORM ADA297938


French translation of Verdammter Atlantik.


Originially published: Hamburg: Nannen Verlag, [1960, c1959].


NPS/DKL Location: GENERAL D781 .U33 1989


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NPS/DKL Location:  GENERAL  V859.G3 H6413 1999


NPS/DKL Location:  GENERAL  D781 .H678 1988


NPS/DKL Location:  GENERAL  V859.G3 H68 1987
NPS/DKL Location: GENERAL D781 .H84


Originally published: Barnsley [U.K.]: Leo Cooper, 2003  


NPS/DKL Location: GENERAL D810.C88 K34 1991

NPS/DKL Location: GENERAL D781.K37 1997

Original Russian text was published in 1994 in a German translation under title: Das Deutsche Unterseeboot U-250. The present edition was translated from the 1984 German translation into Russian.


NPS/DKL Location: GENERAL D781.K45 1994

German translation of The U-boat war in the Caribbean.

Kemp, Paul. **U-boats destroyed: German submarine losses in the World Wars**.
NPS/DKL Location: GENERAL D781.K46 1997

Abstract: A study of the operational leadership exhibited by ADM Karl Doenitz, Commander in Chief, Submarines, German Navy, during World War II. An examination of his planning, preparation and conduct of the U-boat war in the Atlantic Theater of Operations against the British, and later, the Americans. His objective of sinking the merchant fleet of the British nearly brought Britain to defeat. He displayed great talent in his dedicated fight for resources, innovative tactics of using wolfpacks, his intensive training program and unique command and control system, of these innovations enabled him to maximize use of his limited resources in the optimum way possible to achieve the strategic and operational objectives in the theater. He was also a master of operational maneuver and shifted his focus and his assets within his theater to take advantage of allied vulnerabilities. His personal character traits served him well as he
inspired trust and unparalleled loyalty from his subordinates. His operational thinking and practice of operational art throughout this campaign remain a relevant model of operational leadership.

NPS/DKL Location: MICROFORM ADA297842


English translation of Le Mystère de Scapa Flow.


German translation of The phantom of Scapa Flow.


Czech translation of The phantom of Scapa Flow.


Abstract: The battle of the Atlantic is perhaps the most pivotal battle of the Second World War. In it, Germany’s use of asymmetric warfare, mines and submarines, once again threatened Britain’s economic survival. Although Hitler correctly identified Britain’s economy as its center of gravity and had success in attacking it through 1943, he failed to demonstrate the strategic vision necessary to achieve a decisive victory in the Atlantic. Hitler failed because he did not grasp the impact that submarine warfare had in WWII, he wanted a quick, decisive victory like Poland, and he underestimated both the will of the British leadership and the industrial capacity of the United States. Allied success in this campaign enabled the successful prosecution of the war on the European continent through the sallyport of England. From an Allied perspective the Atlantic became the proving ground for the advancement of the carrier-based navy and emerging technology, gave Roosevelt a means with which to invigorate an isolationist society, and gave Britain the time she needed to develop and improve measures to fight the asymmetric threat confronting them. This study looks at the battle of the Atlantic in closer detail while examining Hitler’s overarching strategic objectives and those in this decisive theater in an attempt to explain why Hitler allowed it to simply run its course.

NPS/DKL Location: MICROFORM ADA378290

Electronic access: [http://handle.dtic.mil/100.2/ADA378290](http://handle.dtic.mil/100.2/ADA378290)


Kühn, Volkmar [pseud.] -- see Kurowski, Franz.

Kurowski, Franz.  [Also uses the following pseudonyms: K(arl) Alman, Heinrich Bernig, Rüdiger Greif, Franz K. Kaufmann, Volkmar Kühn, Jason Meeker, Gloria Mellina, Joh(anna) Schulz, Hermann Schulze-Dierschau, Heinrich Schulze-Dierschau, Heinrich Kurowski-Tornau].


English translation of Die Träger des Ritterkreuzes des Eisernen Kreuzes der U-Bootwaffe 1939-1945


Originally published: [Rastatt]: Moewig, 1982.


German translation of U-boat: the secret menace.

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_______.  *U-boat; the secret menace.* [New York, Ballantine Books, 1968].

NPS/DKL Location:  GENERAL  D810.S7 M371 1990


Abridged edition of Die lachende Kuh.


English translation of Die lachende Kuh.

NPS/DKL Location: BUCKLEY D722.U15 M5


NPS/DKL Location: GENERAL V859.G3 M555 2000


NPS/DKL Location: GENERAL D784.C2 M55 1994


NPS/DKL Location: GENERAL CT8.E6 M84 1993


German translation of Neither sharks nor wolves.


NPS/DKL Location: GENERAL D782.B4 N3 1997


Portions of this work appeared previously published in Strategy & tactics magazine.


NPS/DKL Location: GENERAL D781 .P38 2002


English translation of L'affaire du Laconia, 12 septembre 1942.

NPS/DKL Location: GENERAL D772 .L23 P3


English translation of Mein Weg nach Scapa Flow.

NPS/DKL Location: BUCKLEY D811 .P9
Originally published: Berlin: Deutscher Verlag, 1940, as Mein Weg nach Scapa Flow.


NPS/DKL Location: BUCKLEY D782.U16 R6

NPS/DKL Location: GENERAL D781 .R62 1981


German translation of The Secret Capture.

Capture of the U-110, recommissioned as HMS Graph.


Abstract: The problem addressed is the extent to which the United States Navy used Ultra, or Special Intelligence, in the campaign against the German U-boats. Information was gathered through published and unpublished sources. Through a chronological approach, United States Navy involvement is traced from entry into the war until its conclusion. Many factors are involved in the final outcome of the war and Ultra is only one. The Battle of the Atlantic was long and gruesome rather than short and spectacular. The United States Navy used Ultra along with technology, tactics, brilliant leadership and courageous men at sea to win the Battle of the Atlantic in World War II. The lessons for the future are clear. If the United States intends to oppose the Soviet submarine force at sea anywhere in the world, then we must maintain the lead in intelligence, tactics and technology. Further, and most importantly, we must strive to regain superiority of forces in those ocean areas where our interests are at stake.
NPS/DKL Location: MICROFORM ADA089275

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NPS/DKL Location: GENERAL D781 .S43 2000


Originally published: London: W. Kimber, [1952].
NPS/DKL Location: BUCKLEY D782.U2 S3


Schulz, Joh [pseudo.] -- see Kurowski, Franz.


NPS/DKL Location: GENERAL D773 .S7


NPS/DKL Location: GENERAL D781 .S76 1999


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NPS/DKL Location: GENERAL V214 .W23

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254
SUBMARINES -- GREEK -- GENERAL


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SUBMARINES -- ITALIAN -- GENERAL


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Issued under the auspices of the Keimeikai.

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NPS/DKL Location: GENERAL D783.6 .B89 1995


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Hori, Motoyoshi. **Sensuikan.** 1959. 312 p.

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Shiba, Kinpei. *Special attack flotilla: [bushido in the War of Greater East Asia]*. Tokyo, Japan: Japan Times, 1942. 82 p.


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NPS/DKL Location: INTELL VB230.B97 1997

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Wilhelm Gustloff sunk by the S-13 after leaving Gydnia (Gotenhafen) on January 30, 1945.


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Sinking of the refugee ship Struma in the Black Sea, February 23, 1942.


NPS/DKL Location: GENERAL VA575.K14 H83 1997

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Konstantinov, Filipp Vasil’evich and . Igor’ Petrovich Popov. Pod periskopom.


Sinking of the refugee ship Struma in the Black Sea, February 23, 1942.


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“Rohwer was the first to uncover the submarine records with the break-up of the Soviet Union. A Russian submarine commander, Lt Denezhko was given a "medal" for his "heroic" action of killing all these defenceless people.” [http://www.dangoor.com/73page120.html]


Sinking of the refugee ship Struma in the Black Sea, February 23, 1942.


Sunk by the S-13 after leaving Gydnia (Gotenhafen) on January 30, 1945.


Sunk by the S-13 after leaving Gydnia (Gotenhafen) on January 30, 1945.


Sinking of the refugee ship Salvador in the Sea of Marmara December 12, 1940.


Abstract: This thesis analyzes the factors likely to shape the future of the Russian submarine force. It examines key events affecting this force since the collapse of the Soviet Union in 1991, and explores the determinants of these events. The Russian Federation inherited a huge submarine fleet from the Soviet Union. Due to the changing conditions in the world and in Russia, its future status is in doubt. The thesis begins by analyzing the development and roles of the Soviet submarine force. It then considers the four most significant factors that have affected the submarine force since 1991: 1) Russia's poor economic performance, 2) Russia's changing national security requirements, 3) competition from the other military services for a limited defense budget, and 4) changes within the military and society. The thesis concludes that the Russian submarine force is unlikely to undergo a major revival. The most probable scenario
involves a smaller and less capable force. The most influential factors may be Russia’s economic performance and the military reform plans of Russian President Vladimir Putin and Defense Minister Sergey Ivanov.

NPS/DKL Location: THESIS T9315
Electronic access: http://handle.dtic.mil/100.2/ADA392080


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Kellogg, Sanoma Lee and Elizabeth J. Kirk, eds. Reducing wastes from decommissioned nuclear submarines in the Russian Northwest: political, technical, and economic aspects of international cooperation: proceedings from the NATO Advanced Research Workshop "Recycling, Remediation, and


English translation of Problemy bezopasnosti pri ekspluatatsii i utilizatsii atomnykh podvodnykh lodok.


Abstract: This thesis examines the 1986 Chernobyl accident and its consequences as the basis for an analysis of the possible dimensions of the nuclear catastrophes that could occur during the dismantlement process of Russia’s Northern Fleet nuclear submarines. It assesses the potential demographic, ecological,
and economic consequences of a nuclear accident. Given the systemic problems at Russian nuclear facilities, the risks of a catastrophic event in the poorly maintained and operated submarine yards housing over 100 operating nuclear reactors are significant. A major nuclear accident at these facilities could cause damage to the environment of global proportions. This thesis considers the potential environmental impact of a nuclear accident during the nuclear submarine dismantlement process and discusses the environmental damage that has already occurred as a result of Soviet and Russian practices. This thesis also evaluates the risk of diversion of nuclear materials to proliferators or terrorists. Lastly, this thesis examines how the United States, the European Union, and perhaps others could assist Russia in reducing the environmental and proliferation risks in this dismantlement process.

NPS/DKL Location: THESIS S64443
Electronic access: http://library.nps.navy.mil/uhbti/hyperion-image/00Jun_Snell.pdf
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AMERICAN

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