

**NATO UNCLASSIFIED**

**NATO STANDARD**

**MXP-01**

**MULTI-NATIONAL SUBMARINE AND  
ANTI-SUBMARINE EXERCISE MANUAL**

**EDITION E VERSION 7**

**JUNE 2019**



**NORTH ATLANTIC TREATY ORGANIZATION**

**MULTI-NATIONAL EXERCISE PUBLICATION**

Published by the  
NATO STANDARDIZATION OFFICE (NSO)  
© NATO/OTAN



0410LP1194530

**NATO UNCLASSIFIED**

**NATO UNCLASSIFIED**

**INTENTIONALLY BLANK**

**EDITION E VERSION 7**

**NATO UNCLASSIFIED**

July 2019

PUBLICATION NOTICE

1. MXP-01(E)(7), MULTI-NATIONAL SUBMARINE AND ANTI-SUBMARINE EXERCISE MANUAL, is effective upon receipt. It supersedes MXP-01(E)(6).

2. Summary.

a. Chapter 2: Table 2-1. Updated CAN data.

b. Chapter 2: Table 2-7. Updated/added GBR data.

This notice will assist in providing information to cognizant personnel. It is not accountable.

INTENTIONALLY BLANK

**NATO UNCLASSIFIED**

**NORTH ATLANTIC TREATY ORGANIZATION (NATO)**

**NATO STANDARDIZATION OFFICE (NSO)**

**NATO LETTER OF PROMULGATION**

13 June 2019

1. The enclosed Multinational Exercise Publication MXP-01, Edition E, Version 7, MULTI-NATIONAL SUBMARINE AND ANTI-SUBMARINE EXERCISE MANUAL, which has been approved by the nations in the Military Committee Maritime Standardization Board (MCMSB) is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 1052.
2. MXP-01, Edition E, Version 7 is effective upon receipt and supersedes MXP-01, Edition E, Version 6, which shall be destroyed in accordance with the local procedure for the destruction of documents.
3. No part of this publication may be reproduced, stored in a retrieval system, used commercially, adapted, or transmitted in any form or by any means, electronic, mechanical, photo-copying, recording or otherwise, without the prior permission of the publisher. With the exception of commercial sales, this does not apply to member or partner nations, or NATO commands and bodies.
4. This publication shall be handled in accordance with C-M(2002)60
5. Multinational publications are NATO publications mirroring parent classified Allied Publications with the non-releasable information omitted; they are NATO UNCLASSIFIED or are published without any classification marking to ease broad distribution of NATO standardization documents between the Alliance and its interested parties.



Zoltán GULYÁS  
Brigadier General, HUNAF  
Director, NATO Standardization Office

**NATO UNCLASSIFIED**

**NATO UNCLASSIFIED**

**INTENTIONALLY BLANK**

**EDITION E VERSION 7**

**NATO UNCLASSIFIED**

**Navy Warfare Development Command****Allied Publication USN Distribution****SUMMARY NOTE**

1. Summary: MXP-01(E)(7), MULTI-NATIONAL SUBMARINE AND ANTI-SUBMARINE EXERCISE MANUAL, is NATO UNCLASSIFIED. The United States has ratified this publication without reservations. The U.S. implementing document is AXP-01.
2. MXP-01(E)(7) is promulgated and effective upon receipt. It supersedes MXP-01(E)(6). SECNAV M-5510.36 provides procedures for destruction of superseded material in accordance with the Department of the Navy Information Security Program Regulation.
3. USSAN Instruction 1-07 provides procedures for disclosing this publication or portions thereof to foreign governments or international organizations.
4. This Multinational Publication shall not be posted on any freely accessible information or media facility.

**NATO UNCLASSIFIED**

**INTENTIONALLY BLANK**

**NATO UNCLASSIFIED**

NATO UNCLASSIFIED

RECORD OF RESERVATIONS

| CHAPTER                                                                                                                                                                                                                               | RECORD OF RESERVATION BY NATIONS |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
|                                                                                                                                                                                                                                       |                                  |
| Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations. |                                  |

**NATO UNCLASSIFIED**

**INTENTIONALLY BLANK**

**NATO UNCLASSIFIED**

# NATO UNCLASSIFIED

## RECORD OF SPECIFIC RESERVATIONS

| NATION                                                                                                                                                                                                                                | DETAILS OF RESERVATIONS                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FRA                                                                                                                                                                                                                                   | France reiterates the reservation it made on previous editions of the STANAG (see reference 2 for edition 35 of STANAG 1052): Table 3-2: "RELAXATION TABLE", page 3-12: "During NATO exercises, French SUBOPAUTHs will not approve Relaxation "8*N" and French ships equipped with VDS will receive the order not to stop their sonar while they are trailing their VDS".                          |
| HRV                                                                                                                                                                                                                                   | Publication is partly applicable in Croatian Navy. Reservations refers to conduct exercises which require submarine, Anti-Submarine Warfare (ASW) air forces and armaments (including simulators) and equipment for submarine rescue operations. Particularly, CASEX A-5, CASEX A-6, CASEX A-7, CASEX A-9, CASEX A-10, CASEX A-23 in CHAPTER 3, CHAPTER 4 and CHAPTER 5 are not applicable.        |
| TUR                                                                                                                                                                                                                                   | (1) Turkey does not accept the terms "Coastal Area" and "Littoral Waters" due to not included in international law. These terminologies neither have effect nor any implication in terms of sovereign rights of states under international law. (2) Since ATP-10 is outdated and poses risk for search and rescue operations, Turkey will use IAMSER and ATP-57 wherever reference made to ATP-10. |
|                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                    |
| Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations. |                                                                                                                                                                                                                                                                                                                                                                                                    |

**NATO UNCLASSIFIED**

**INTENTIONALLY BLANK**

**NATO UNCLASSIFIED**

# **NATO UNCLASSIFIED**

## **SUMMARY OF CHANGES**

Chapter 2: Table 2-1. Updated CAN data.

Chapter 2: Table 2-7. Updated / added GBR data.

**NATO UNCLASSIFIED**

**INTENTIONALLY BLANK**

**NATO UNCLASSIFIED**

## TABLE OF CONTENTS

### CHAPTER 1 - INTRODUCTION TO THE EXERCISES

|             |                                  |     |
|-------------|----------------------------------|-----|
| 1.1         | Training within NATO .....       | 1-1 |
| 1.2         | Scope of the Exercises .....     | 1-1 |
| 1.3         | Security.....                    | 1-1 |
| 1.4         | Conferences/Discussions.....     | 1-2 |
| 1.5         | Analysis .....                   | 1-2 |
| 1.6 - 1.9   | Spare.....                       | 1-2 |
| 1.10        | Command .....                    | 1-2 |
| 1.11 - 1.19 | Spare.....                       | 1-2 |
| 1.20        | Definitions.....                 | 1-3 |
| 1.21 - 1.29 | Spare.....                       | 1-4 |
| 1.30        | Relaxation of Restrictions ..... | 1-5 |

### CHAPTER 2 - SAFETY PRECAUTIONS, OPERATING RESTRICTIONS AND CASUALTY PROCEDURES

#### SECTION 1 - GENERAL

|                 |                                                                                 |      |
|-----------------|---------------------------------------------------------------------------------|------|
| 2.1.1           | Submarine Operating Conditions .....                                            | 2-1  |
| 2.1.2           | Introduction.....                                                               | 2-1  |
| 2.1.3           | External Appearance .....                                                       | 2-1  |
| 2.1.4           | Navigation Lights .....                                                         | 2-1  |
| 2.1.5           | Damage Control.....                                                             | 2-2  |
| 2.1.6           | Handling Characteristics .....                                                  | 2-2  |
| 2.1.7 - 2.1.9   | Spare.....                                                                      | 2-2  |
| 2.1.10          | Responsibilities When Exercising With Submarines.....                           | 2-2  |
| 2.1.11          | Responsibility for Avoiding Collision between Surface Ships and Submarines..... | 2-2  |
| 2.1.12          | Responsibility for the Safe Navigation of the Submarine .....                   | 2-3  |
| 2.1.13          | Submarines and Fishing Vessels .....                                            | 2-4  |
| 2.1.14          | Procedure UNIFORM .....                                                         | 2-6  |
| 2.1.15          | Procedure HOOKER .....                                                          | 2-7  |
| 2.1.16          | Sonar Protective Measures.....                                                  | 2-9  |
| 2.1.17          | Helicopter Dipping Sonar Protective Measures .....                              | 2-10 |
| 2.1.18          | Explosive Echo Ranging (EER) Protective Measures .....                          | 2-10 |
| 2.1.19 - 2.1.99 | Spare.....                                                                      | 2-10 |

#### SECTION 2 - SAFETY AND THE CONDUCT OF UNITS DURING ASW EXERCISES

|               |                                                       |      |
|---------------|-------------------------------------------------------|------|
| 2.2.1         | Emergencies during ASW Exercises.....                 | 2-11 |
| 2.2.2         | Aircraft Emergencies.....                             | 2-11 |
| 2.2.3         | Submarine Emergency .....                             | 2-12 |
| 2.2.4         | Submarine Surfacing in an Emergency .....             | 2-13 |
| 2.2.5 - 2.2.9 | Spare.....                                            | 2-13 |
| 2.2.10        | Basic Safety Rules, Procedures and Requirements ..... | 2-13 |
| 2.2.11        | Safety Separation of ASW Forces.....                  | 2-13 |
| 2.2.12        | Horizontal Safety Separation .....                    | 2-13 |
| 2.2.13        | Safety Precautions When Deploying VDS/TAS/MTAS .....  | 2-14 |
| 2.2.14        | Vertical Safety Separation/Safe Depth Operation ..... | 2-17 |

|                 |                                                                                                                                         |      |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------|------|
| 2.2.15          | Visibility Requirements.....                                                                                                            | 2-25 |
| 2.2.16          | Minimum Submarine Acoustic Equipment Requirements .....                                                                                 | 2-25 |
| 2.2.17          | Surface Ship Noise .....                                                                                                                | 2-26 |
| 2.2.18          | Lookouts .....                                                                                                                          | 2-26 |
| 2.2.19          | Underwater Telephone Watch.....                                                                                                         | 2-27 |
| 2.2.20          | Communications and Signals.....                                                                                                         | 2-27 |
| 2.2.21          | Dumping of Trash, Garbage and Waste (Gash) .....                                                                                        | 2-28 |
| 2.2.22 - 2.2.29 | Spare .....                                                                                                                             | 2-28 |
| 2.2.30          | Specific Safety Precautions .....                                                                                                       | 2-28 |
| 2.2.31          | Safety Precautions When Operating With Aircraft .....                                                                                   | 2-28 |
| 2.2.32          | Safety Precautions When Surface Ships Approach.....                                                                                     | 2-29 |
| 2.2.33          | Safety Precautions When Employing Towed Decoys.....                                                                                     | 2-29 |
| 2.2.34          | Safety Precautions When Employing Helicopter Sonar .....                                                                                | 2-29 |
| 2.2.35          | Additional Restrictions to Establish a Vertical Safety Separation When<br>Towed VDS/DTAS is Used .....                                  | 2-30 |
| 2.2.36          | Additional Restrictions to Establish a Horizontal Safety Separation "Neutral<br>Corridor" When Towed VDS/DTAS/MTAS is Used .....        | 2-39 |
| 2.2.37          | Additional Restrictions When CATAS is Used.....                                                                                         | 2-43 |
| 2.2.38          | Exercise Stovepipe/Skylight.....                                                                                                        | 2-44 |
| 2.2.39          | The Use of Explosive Charges.....                                                                                                       | 2-45 |
| 2.2.40          | Electronic Sound Under-Water Signals (ESUS) .....                                                                                       | 2-47 |
| 2.2.41 - 2.2.49 | Spare .....                                                                                                                             | 2-48 |
| 2.2.50          | ASW Exercise Restrictions .....                                                                                                         | 2-55 |
| 2.2.51          | ASW Investigation Restrictions .....                                                                                                    | 2-55 |
| 2.2.52          | ASW Exercise Attack Restrictions.....                                                                                                   | 2-55 |
| 2.2.53          | (NMM).....                                                                                                                              | 2-55 |
| 2.2.54          | Night ASW Exercise Restrictions .....                                                                                                   | 2-58 |
| 2.2.55 - 2.2.59 | Spare .....                                                                                                                             | 2-58 |
| 2.2.60          | Positioning of Surface Ships and Helicopters While Submarines Dive .....                                                                | 2-58 |
| 2.2.61 - 2.2.69 | Spare .....                                                                                                                             | 2-59 |
| 2.2.70          | Procedures for Units to Bring a Submarine from Safe to PD .....                                                                         | 2-59 |
| 2.2.71          | Responsibilities for Submarine Safety When Returning to PD.....                                                                         | 2-59 |
| 2.2.72          | Surfacing Methods and Procedures .....                                                                                                  | 2-59 |
| 2.2.73          | Conduct and Procedures for Surface Ships and/or Helicopters in the<br>Vicinity of a Submarine that is Coming to PD - Method ALFA.....   | 2-63 |
| 2.2.74          | Conduct and Procedures for Surface Ships and/or Helicopters in the<br>Vicinity of a Submarine that is Coming to PD - Method BRAVO ..... | 2-64 |
| 2.2.75          | Conduct of ASW Ships at Stop Time.....                                                                                                  | 2-64 |
| 2.2.76 - 2.2.79 | Spare .....                                                                                                                             | 2-65 |
| 2.2.80          | (NMM) .....                                                                                                                             | 2-65 |
| 2.2.81-2.2.89   | Spare .....                                                                                                                             | 2-65 |
| 2.2.90          | ASW Exercises in Shallow and Confined Waters .....                                                                                      | 2-65 |

## CHAPTER 3 - STANDARD EXERCISES AND METHOD OF ORDERING

|     |                                                      |     |
|-----|------------------------------------------------------|-----|
| 3.1 | Summary of Standard Exercises.....                   | 3-1 |
| 3.2 | Substitution for a Submarine.....                    | 3-1 |
| 3.3 | Method of Ordering Exercises.....                    | 3-2 |
| 3.4 | Order Table (Table 3-1) .....                        | 3-2 |
| 3.5 | Relaxation Table (Table 3-2).....                    | 3-2 |
| 3.6 | Exercise Instructions (Table 3-3).....               | 3-2 |
| 3.7 | Submarine Course and Speed Diagrams (Table 3-4)..... | 3-2 |
| 3.8 | Special Procedures.....                              | 3-3 |

|                                                                                                                |                                                                                                    |       |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------|
| 3.9                                                                                                            | Issuing CASEX Standard Instructions .....                                                          | 3-3   |
| 3.10-3.99                                                                                                      | Spare .....                                                                                        | 3-4   |
| Table 3-1 to Table 3-10 ( <i>individual table listings, see Table of Contents List of Tables</i> ) 3-4 to 3-43 |                                                                                                    |       |
| CASEX A-1                                                                                                      | Basic Tracking Exercise .....                                                                      | 3-45  |
| CASEX A-2                                                                                                      | Basic Coordinated Tracking Exercise .....                                                          | 3-47  |
| CASEX A-3                                                                                                      | Basic SAU Exercise .....                                                                           | 3-49  |
| CASEX A-4                                                                                                      | Advanced SAU Exercise .....                                                                        | 3-51  |
| CASEX A-5                                                                                                      | Basic Submarine Attack on a Screened or Unscreened Target<br>(Counter-Attack Not Allowed) .....    | 3-53  |
| CASEX A-6                                                                                                      | Intermediate Submarine Attack in a Screened or Unscreened Target<br>(Counter-Attack Allowed) ..... | 3-55  |
| CASEX A-7                                                                                                      | (NMM) .....                                                                                        | 3-57  |
| CASEX A-8                                                                                                      | Defence of an Open Anchorage or Assault Area .....                                                 | 3-59  |
| CASEX A-9                                                                                                      | VDS Tracking Exercise Using Safety Zone Separation .....                                           | 3-61  |
| CASEX A-10                                                                                                     | VDS Tracking Exercise Using a Submarine Area and Safety Zone .....                                 | 3-65  |
| CASEX A-11                                                                                                     | Sonar Passive Tracking .....                                                                       | 3-69  |
| CASEX A-12                                                                                                     | Sonar Passive Tracking (Multi-Ship) .....                                                          | 3-71  |
| CASEX A-13                                                                                                     | Passive Tracking Exercise .....                                                                    | 3-73  |
| CASEX A-21                                                                                                     | Basic Passive Tracking Exercise .....                                                              | 3-75  |
| CASEX A-22                                                                                                     | Long-Range Passive Detection and Localization Exercise .....                                       | 3-77  |
| CASEX A-23                                                                                                     | (NMM) .....                                                                                        | 3-79  |
| CASEX A-24                                                                                                     | Intermediate ASW Area Search .....                                                                 | 3-81  |
| CASEX B-1                                                                                                      | Basic Search, Homing and Attack by Aircraft .....                                                  | 3-83  |
| CASEX B-2                                                                                                      | Basic Localization and Attack by Aircraft .....                                                    | 3-85  |
| CASEX B-3                                                                                                      | Advanced Search, Localization and Attack by Aircraft .....                                         | 3-87  |
| CASEX B-4                                                                                                      | Basic Air/Sub Operation Exercise .....                                                             | 3-89  |
| CASEX B-5                                                                                                      | Advanced Air/Sub Operation Exercise .....                                                          | 3-93  |
| CASEX B-6                                                                                                      | Basic Passive Tracking and Attack by Aircraft .....                                                | 3-97  |
| CASEX B-7                                                                                                      | Defence of a Coastal Area by MPA against Submarine in MIO .....                                    | 3-99  |
| CASEX C-1                                                                                                      | (NMM) .....                                                                                        | 3-101 |
| CASEX C-2                                                                                                      | Basic Coordinated ASW Exercise .....                                                               | 3-103 |
| CASEX C-3                                                                                                      | Advanced Coordinated ASW Exercise .....                                                            | 3-105 |
| CASEX C-4                                                                                                      | Advanced Coordinated ASW Exercise - Protection of a Force .....                                    | 3-107 |
| CASEX C-5                                                                                                      | Advanced Coordinated ASW Exercise Against Transiting/Patrolling<br>Submarines .....                | 3-109 |
| CASEX C-6                                                                                                      | VDS/MTAS Exercise Using Safety Zone Separation .....                                               | 3-111 |
| CASEX C-7                                                                                                      | Defence of Main Body During Opposed Sortie/Entry .....                                             | 3-115 |
| CASEX C-8                                                                                                      | (NMM) .....                                                                                        | 3-117 |
| CASEX C-9                                                                                                      | ASW Forces Area Search Followed by Submarine Attack on Underway<br>Replenishment Group .....       | 3-119 |
| CASEX C-10                                                                                                     | Coordinated Passive Tracking Exercise by TAS Units and Aircraft .....                              | 3-123 |
| CASEX C-11                                                                                                     | Intermediate Coordinated ASW Area Search .....                                                     | 3-125 |
| CASEX C-12                                                                                                     | Advanced Coordinated ASW Exercise (PROWLEX) .....                                                  | 3-127 |
| CASEX D-1                                                                                                      | (NMM) .....                                                                                        | 3-131 |
| CASEX D-2                                                                                                      | (NMM) .....                                                                                        | 3-133 |
| CASEX D-3                                                                                                      | (NMM) .....                                                                                        | 3-135 |
| CASEX D-4                                                                                                      | (NMM) .....                                                                                        | 3-137 |
| CASEX D-5                                                                                                      | (NMM) .....                                                                                        | 3-139 |
| CASEX E-1                                                                                                      | Familiarization – Submarine and ASW Units .....                                                    | 3-141 |
| CASEX E-2                                                                                                      | (NMM) .....                                                                                        | 3-147 |
| CASEX E-3                                                                                                      | Mutual Sensor Exercise .....                                                                       | 3-149 |
| CASEX E-4                                                                                                      | ASW Action against Bottomed Submarine or Target .....                                              | 3-151 |

|           |                                                                            |       |
|-----------|----------------------------------------------------------------------------|-------|
| CASEX E-5 | Exercise in Searching for a Simulated Submarine in Distress (SMASHEX)..... | 3-153 |
| CASEX E-7 | (NMM) .....                                                                | 3-157 |
| CASEX E-8 | Helicopter Delivered Depth Charge Exercise .....                           | 3-159 |
| CASEX F-1 | Basic Simulated Anti-Submarine Warfare Exercise (LINKEX).....              | 3-163 |
| CASEX F-2 | Simulated Anti-Submarine Warfare Exercise .....                            | 3-165 |

## CHAPTER 4 - INSTRUCTIONS, DEFINITIONS, SAFETY RULES AND PROCEDURES APPLICABLE TO SUBMARINE ASW EXERCISES – COORDINATED SUBMARINE OPERATIONS – “S” SERIES

|             |                                                                                               |     |
|-------------|-----------------------------------------------------------------------------------------------|-----|
| 4.1         | Instructions for Submarine ASW Exercises .....                                                | 4-1 |
| 4.2         | Purpose .....                                                                                 | 4-1 |
| 4.3         | Minimum Requirements for Participating Submarines .....                                       | 4-1 |
| 4.4         | When Exercises may be Conducted .....                                                         | 4-1 |
| 4.5         | Records .....                                                                                 | 4-1 |
| 4.6         | Intelligence Based on Safety Signals .....                                                    | 4-2 |
| 4.7 - 4.9   | Spare .....                                                                                   | 4-2 |
| 4.10        | Definitions Applicable to Submarine ASW Exercises .....                                       | 4-2 |
| 4.11        | Marked Submarine.....                                                                         | 4-2 |
| 4.12        | Responsible Submarines .....                                                                  | 4-2 |
| 4.13        | Safety Bearing .....                                                                          | 4-2 |
| 4.14        | Safety Circles.....                                                                           | 4-2 |
| 4.15        | Safety Line.....                                                                              | 4-3 |
| 4.16        | Safety Zones.....                                                                             | 4-3 |
| 4.17        | Too Close .....                                                                               | 4-3 |
| 4.18        | Transit Lane.....                                                                             | 4-3 |
| 4.19        | Transit Positions .....                                                                       | 4-3 |
| 4.20        | Safety Rules for Exercises Involving More than One Submarine.....                             | 4-3 |
| 4.21        | Responsibility for Avoiding Submerged Collision .....                                         | 4-4 |
| 4.22        | Safety Circle .....                                                                           | 4-4 |
| 4.23        | Safety Line.....                                                                              | 4-5 |
| 4.24        | Safety Zones and Transit Lanes .....                                                          | 4-5 |
| 4.25        | Safety Rules for Basic Exercises .....                                                        | 4-5 |
| 4.26        | Safety Rules for Advanced Exercises .....                                                     | 4-5 |
| 4.27        | (NMM) .....                                                                                   | 4-5 |
| 4.28        | Separation between Target Submarines .....                                                    | 4-5 |
| 4.29        | Spare .....                                                                                   | 4-6 |
| 4.30        | Procedures Applicable to Submarine ASW Exercises.....                                         | 4-6 |
| 4.31        | Gridlock .....                                                                                | 4-6 |
| 4.32        | Procedure for Submarines Changing Depth through Depth Zones Assigned to Other Submarines..... | 4-6 |
| 4.33        | Use of Underwater Telephone .....                                                             | 4-7 |
| 4.34        | Marking Attacks .....                                                                         | 4-7 |
| 4.35        | Requirements When Torpedoes are Fired .....                                                   | 4-8 |
| 4.36 - 4.39 | Spare .....                                                                                   | 4-8 |
| 4.40        | Method of Ordering Submarine ASW Exercises.....                                               | 4-8 |
| 4.41 - 4.49 | Spare .....                                                                                   | 4-8 |
| 4.50        | (NMM) .....                                                                                   | 4-8 |
| 4.51        | (NMM) .....                                                                                   | 4-8 |
| 4.52        | (NMM) .....                                                                                   | 4-9 |
| 4.53 - 4.99 | Spare .....                                                                                   |     |
| CASEX S-1   | Submarine, at or Below Safe Depth, Attacks another Submarine                                  |     |

|                                                                                                                                                                          |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Transiting its Patrol Area at Periscope Depth.....                                                                                                                       | 4-11 |
| CASEX S-2 Submarine, at Periscope Depth (or with Freedom in Depth Until<br>Detecting HE) Attacks another Submarine Transiting its Patrol<br>Area at Periscope Depth..... | 4-13 |
| CASEX S-3 Submarine with Freedom in Depth Attacks another Submarine<br>Transiting Close to its Patrol Area at Periscope Depth .....                                      | 4-17 |
| CASEX S-4 Submarine Transiting Their Patrol Areas at Periscope Depth<br>(by Day Only) .....                                                                              | 4-19 |
| CASEX S-5 One or More Submarines with Freedom in Depth Attack Another<br>Submarine Restricted in Depth in a Transit Lane Transiting<br>Through Their Areas.....          | 4-21 |
| CASEX S-6 One or More Patrolling Submarines with Relative Freedom in<br>Depth Attack Other Submarines with Relative Freedom in Depth<br>Transiting Their Areas .....     | 4-23 |
| CASEX S-7 (NMM) .....                                                                                                                                                    | 4-27 |
| CASEX S-8 (NMM) .....                                                                                                                                                    | 4-29 |
| CASEX S-9 Advanced Exercise of Detection, Tracking and Attack of a Transiting<br>Submarine on a SUBNOTE.....                                                             | 4-31 |
| CASEX S-10 (NMM) .....                                                                                                                                                   | 4-35 |
| CASEX S-11 (NMM) .....                                                                                                                                                   | 4-37 |

## CHAPTER 5 - COMMUNICATIONS

|                                                                       |     |
|-----------------------------------------------------------------------|-----|
| 5.1 Introductions .....                                               | 5-1 |
| 5.2 - 5.9 Spare.....                                                  | 5-1 |
| 5.10 Communication Methods .....                                      | 5-1 |
| 5.11 Explosive Charge Signals .....                                   | 5-1 |
| 5.12 Submarine Pyrotechnic Signals .....                              | 5-2 |
| 5.13 Sonar Signal Code Table .....                                    | 5-2 |
| 5.14 Submarine Safety and Control Signals.....                        | 5-2 |
| 5.15 Ship/Submarine Torpedo Attack Signals.....                       | 5-3 |
| 5.16 Signals by Aircraft Manoeuvre .....                              | 5-3 |
| 5.17 Aircraft or Surface Emergency/Contingency Distress Signals ..... | 5-3 |
| 5.18 Special Signals .....                                            | 5-4 |
| 5.19 Submarine Attack Signals.....                                    | 5-4 |
| 5.20 Diving Messages, Surfacing Messages and Check Reports .....      | 5-5 |
| 5.21 (NMM) .....                                                      | 5-6 |
| 5.22 - 5.99 Spare.....                                                | 5-6 |

## CHAPTER 6 - RECORDS AND ANALYSIS

|                                                         |     |
|---------------------------------------------------------|-----|
| 6.1 General Considerations .....                        | 6-1 |
| 6.2 Analysis or Assessment of Weapon Attacks .....      | 6-1 |
| 6.3 Tactical Analysis .....                             | 6-3 |
| 6.4 Claims for Attacks by Submarines or ASW Ships ..... | 6-3 |
| 6.5 Submarine Track Message .....                       | 6-4 |
| 6.6 Data Forms.....                                     | 6-5 |
| 6.7 (NMM) .....                                         | 6-6 |
| 6.8 - 6.99 Spare.....                                   | 6-6 |

|                       |            |
|-----------------------|------------|
| <b>GLOSSARY</b> ..... | Glossary-1 |
|-----------------------|------------|

|                    |         |
|--------------------|---------|
| <b>INDEX</b> ..... | Index-1 |
|--------------------|---------|

## **LIST OF TABLES**

|            |                                                                     |      |
|------------|---------------------------------------------------------------------|------|
| Table 2-1  | Submarine identification Lights .....                               | 2-1  |
| Table 2-2  | Depth Limitations .....                                             | 2-19 |
| Table 2-3  | Decoy and Towed Sonar Training Target Depth Restrictions .....      | 2-22 |
| Table 2-4  | Submarine Launched Smoke/Flare/Pyrotechnic .....                    | 2-27 |
| Table 2-5  | General Authorization VDS/TAS/MTAS .....                            | 2-32 |
| Table 2-6A | VDS Specifications .....                                            | 2-34 |
| Table 2-6B | Towed Array Specifications .....                                    | 2-35 |
| Table 2-6C | Multiple Towed Array System Specifications .....                    | 2-37 |
| Table 2-6D | Automatic Sequencing UWT Specifications .....                       | 2-38 |
| Table 2-7  | Explosive Charges to be used in Exercises against Submarines .....  | 2-48 |
| Table 3-1  | Order Table .....                                                   | 3-4  |
| Table 3-2  | Relaxation Table .....                                              | 3-8  |
| Table 3-3  | Exercise Instruction Tables .....                                   | 3-17 |
| Table 3-4  | Submarine Speed and Course Diagrams .....                           | 3-29 |
| Table 3-5  | CASEX A Series – Exercises Involving Ships and/or Helicopters ..... | 3-41 |
| Table 3-6  | CASEX B Series – Exercises Involving ASW Aircraft .....             | 3-42 |
| Table 3-7  | CASEX C Series – exercises Involving Multiple Forces .....          | 3-42 |
| Table 3-8  | (NMM) .....                                                         | 3-43 |
| Table 3-9  | CASEX E Series – Exercises of a Miscellaneous Nature .....          | 3-43 |
| Table 3-10 | CASEX F Series – Synthetic Exercises .....                          | 3-43 |
| Table 4-1  | Changing Depth safety Signals .....                                 | 4-7  |
| Table 4-2  | S' Series CASEXes .....                                             | 4-9  |
| Table 4-3  | Transit Lane .....                                                  | 4-32 |
| Table 5-1  | Characteristics of National Submarine Pyrotechnics .....            | 5-7  |
| Table 5-2  | Explosive Charge Signals .....                                      | 5-8  |
| Table 5-3  | Submarine Pyrotechnics and SST/UWT Signals by Day & Night .....     | 5-11 |
| Table 5-4  | Underwater Signal Code Table .....                                  | 5-14 |
| Table 5-5  | ESUS MK84 Underwater Signal Code .....                              | 5-17 |
| Table 5-6  | Ship/Submarine Torpedo Attack .....                                 | 5-18 |
| Table 5-7  | Signals by Aircraft .....                                           | 5-19 |
| Table 5-8  | Aircraft Distress Signal .....                                      | 5-20 |
| Table 5-9  | Range by Method MARK .....                                          | 5-23 |
| Table 6-1  | Brevity Code .....                                                  | 6-7  |
| Table 6-2  | (NMM) .....                                                         | 6-7  |

## **LIST OF FIGURES**

|            |                                                              |      |
|------------|--------------------------------------------------------------|------|
| Figure 2-1 | Fishing Vessel Safety .....                                  | 2-4  |
| Figure 2-2 | Procedure UNIFORM .....                                      | 2-7  |
| Figure 2-3 | Procedure HOOKER .....                                       | 2-9  |
| Figure 2-4 | (NU) (NMM) .....                                             | 2-14 |
| Figure 2-5 | Vertical Safety Separation Calculations using Column X ..... | 2-21 |
| Figure 2-6 | Vertical Safety Separation Calculations using Column Y ..... | 2-22 |
| Figure 2-7 | Vertical Safety Separation with 2 Submarines .....           | 2-24 |
| Figure 2-8 | Relaxation 14*B and 14*C .....                               | 2-41 |
| Figure 2-9 | Relaxation 14*D .....                                        | 2-44 |

|             |                                                                       |      |
|-------------|-----------------------------------------------------------------------|------|
| Figure 2-10 | Close Quarters CASEXes .....                                          | 2-40 |
| Figure 4-1  | Submarine Transit Lane .....                                          | 4-32 |
| Figure 6-1  | CASEX Form A – A/S Ship/Target Ship Record Form.....                  | 6-8  |
| Figure 6-2  | CASEX Form B – Fixed Wing Aircraft Anti-Submarine Sortie Report ..... | 6-10 |
| Figure 6-3  | CASEX Form C – Submarine Record Form .....                            | 6-17 |
| Figure 6-4  | CASEX Form D – Helicopter Anti-Submarine Sortie Report .....          | 6-19 |

**INTENTIONALLY BLANK**

## CHAPTER 1

### INTRODUCTION TO THE EXERCISES

#### 1.1 TRAINING WITHIN NATO

1.1.1 (NU) Training is a national responsibility and each NATO country undertakes to train its own units with its own facilities to the limits of its own capabilities. Coordination between units of different nationalities is facilitated if training is based on the doctrine promulgated in Allied Tactical Publications.

1.1.2. (NU) The state of training of submarines taking part in exercises is presumed to be such that anti-submarine operations may be undertaken. Submarines taking part in submarine versus submarine exercises must be given prior approval for advanced anti-submarine exercises by national commanders.

#### 1.2 SCOPE OF THE EXERCISES

1.2.1. (NU) The standard exercises listed in Chapters 3 and 4 of AXP-01 are provided to facilitate the progressive training of different types of ASW units, both independently and in coordination, in the various aspects of anti-submarine warfare. Exercise standards progress from the elementary stage through the more advanced coordinated stage, and culminate in the standards required for participation in major exercises.

1.2.2. (NU) The individual CASEX provides a framework to progress fundamental training aims (procedural as well as tactical). It is the responsibility of CASEX planning authorities to ensure that this framework is broadened as required to encompass the particular training requirements of individual units. This can be achieved by the use of the appropriate relaxations, exercise instructions and special instructions listed. ASW officers should try to address all relevant aspects of ASW in both deep and shallow water without increasing the difficulty of an ASW training schedule too quickly.

1.2.3. (NU) Authorities and individual units should also, wherever possible, evaluate new procedures and tactics during ASW training. Where a new tactic appears to contravene the safety rules stated in AXP-01, guidance should be obtained from higher authority and in particular, the appropriate Submarine Operating Authority (SUBOPAUTH).

#### 1.3 SECURITY

(NU) The majority of information in this publication is, of itself, unclassified. It must be kept in mind, however, that once a particular scenario and training objectives have been chosen, the package so produced and its execution can reveal a great deal about current tactics and operational capabilities. All concerned must ensure that operation orders, message traffic and exercise reports are properly classified to guard against inadvertent release of classified information on weapon and sensor capabilities, platform characteristics or current tactics.

## 1.4 CONFERENCES/DISCUSSIONS

(NU) Pre-exercise conferences between the various participating units are beneficial in saving exercise time and avoiding mistakes. Such discussions are normally held prior to more advanced exercises, but are generally not necessary in regard to more elementary exercises. Post-exercise discussion are most valuable if they take place immediately after an exercise. Many exercises can be analyzed on the spot, and the lessons learned from them can be passed on immediately to the units.

## 1.5 ANALYSIS

(NU) Exercise analysis may take longer if it requires the examination of records, but it is important that the results be extracted and passed in as quickly as possible. Details of particular exercises are soon forgotten, and valuable training lessons can be lost when post-exercise analysis is conducted late and results are slow reaching exercise participants.

## 1.6 - 1.9 Spare

## 1.10 COMMAND

1.10.1. (NU) **Officer Scheduling the Exercise (OSE).** The OSE originates the exercise and orders it to take place. He will issue basic instructions which will include the objectives of the exercise, the designation of the exercise areas, the allocation of forces and the necessary coordinating instructions. He will also designate the Officer Conducting the Exercise (OCE). He will ensure that the existence of submarine danger areas inside the exercise area are highlighted in the EXOPORDER or exercise instruction. The OSE specifies the process for the integration and control of submarine assets in the exercise. He will arrange the nomination of one or more SUBOPAUTH to assume operational control of all submarines participating in the exercise.

1.10.2. (NU) **Officer Conducting the Exercise (OCE).** The OCE is responsible to the OSE for the conduct of the exercise. He will issue such necessary supplementary instructions as:

- a. Detailed orders to all participating units;
- b. Collation of records, quick-look analysis and de-brief,
- c. Safety precautions; and
- d. Conduct of the exercise as it develops.

1.10.3. (NU) **Officer in Tactical Command (OTC).** The OTC is the senior officer present eligible to assume command, or the officer to whom he has delegated tactical command.

1.10.4. (NU) **Officer Conducting the Serial (OCS).** The OCS is the officer designated to exercise tactical control over assigned forces for a specific exercise serial.

1.10.5. (NU) **Submarine Operating Authority (SUBOPAUTH).** The SUBOPAUTH is the Command exercising operational control over submarines, and is normally a submarine force

commander. Under special circumstances tactical control may be delegated to another shore command or to a command afloat.

## 1.11 - 1.19 Spare

## 1.20 DEFINITIONS

1.20.1 (NU) The definitions contained in this section are considered particularly important. Additional definitions relevant to the exercises are also contained in the Glossary:

- a. **GO TIME.** The start of an ASW exercise period. After this time, dived submarines may be encountered and full safety precautions must be observed until STOP TIME.
- b. **COMEX.** COMEX is the time of starting an ASW action. It is normally a warning to the submarine of attacks by ASW units.
- c. **ASW Action.** An exercise ASW action is an operation by one or more ASW units against a particular submarine. In order to permit the necessary maneuvers for ASW action to be safely executed, safety precautions to be taken by the submarine(s) and ASW units may be in addition to the safety precautions required in the exercise as a whole. In exercises, ASW action begins with COMEX and ends with FINEX or STOP TIME, whichever is earlier. If it is desired to continue the ASW action after FINEX, then a new COMEX must be ordered, providing that this is allowed by the exercise orders (see Article 5.14.5).
- d. **Duration.** Duration is the specified time period for an ASW action. It must be given in minutes in the exercise orders. When relaxation 2\*M is in force, duration is not required.
- e. **FINEX.** In exercises and when duration has been established, it is the time of ending of an ASW Action. It is equal to COMEX plus the duration of ASW action ordered.
- f. **STOP TIME.** The end of an ASW exercise period.
- g. **Surfacing Procedure.** The method used by a submarine, ship or helicopter to bring a submarine from Safe Depth to Periscope Depth (PD).
- h. **Submarine Depth.** The depth of a submarine is measured from the surface to the keel depth.
- i. **Safe Depth.** A submarine is said to be at Safe Depth when its keel depth is such as to provide the required separation between the top of the fixed structure of the submarine and the lowest point of any ship, other submarine assigned to a higher layer, towed ASW device and/or helicopter sonar systems allowed in the orders for the exercise. When more than one towed device is being used in the exercise, Safe Depth applies to the deepest device being employed.
- j. **Safety Course.** A pre-arranged course included in the detailed orders for the

exercise. It must be one of the cardinal points of the compass, and it is always signaled as "NORTH", "SOUTH", "EAST" or "WEST". It, or its reciprocal is the course to be steered when a submarine is coming to PD using surfacing procedures or in an emergency. When operating in a Fjord, Loch or Rias environment, the terms INWARD / OUTWARD may be designated as the Safety Course in lieu of the cardinal points identified above.

- k. **Relaxation.** A modification of safety precautions and operating restrictions laid down in this publication in order to make the training more realistic (see Article 3.5.).
- l. **Starred Relaxation.** A relaxation, which may be used only with the prior approval of the SUBOPAUTH.
- m. **Time.** Zone time to be used throughout the exercises (UTC / GMT (ZULU) is to be used whenever possible to avoid confusion).
- n. **Daylight.** Daylight is defined as extending from sunrise to sunset.
- o. **Night.** Night is defined as extending from sunset to sunrise.
- p. **Units of Measurement.** NATO publications adhere to the following standard units of measurement:
  - (1) Range - Yards (yds)
  - (2) Distance - Nautical Miles (nm)
  - (3) Altitude - Feet (ft)
  - (4) Depth of objects and Water Depth - Metres (m) (5) Speed - Knots (kt)

**NOTE.**

*The above mentioned standard units are not to be confused with code words RANGE and ALTITUDE. For safety purposes during the transition period, where water depth and depth of objects were given in feet or fathoms, the new metric figures are now followed by the figures in feet or fathoms (as appropriate) in brackets.*

- q. **Maximum power** shall be understood to mean a power level setting, which will deliver the maximum acoustic energy into the water at a level just below that which causes transducer cavitation.
- r. **Maximum Scale** shall be understood to mean the maximum range scale setting regardless of actual water depth. On fathometers that have variable or selectable pulse length, the maximum pulse length shall be used in conjunction with the maximum scale.

**1.21 - 1.29 Spare**

**1.30 RELAXATION OF RESTRICTIONS**

(NU) To provide added realism in training or to enable the exercise to become progressively more realistic, exercise rules given in Chapter 2 may be relaxed. Certain of the relaxations may be made only with the prior approval of the SUBOPAUTH or appropriate Air Commander and are dependent on the state of training of the participating units, their equipment and capabilities. It is important when considering major or advanced exercises that the ASW exercise planners and the SUBOPAUTH jointly review the relaxations to be used, since failure to allow the maximum relaxations consistent with submarine safety may impair unnecessarily the value of the exercise. When the SUBOPAUTH has OPGON of a submarine from another nation, approval of any starred relaxation should only be given with the concurrence of the appropriate national authority. The Relaxation Table is contained in Chapter 3 as Table 3-2; instructions for its use are given in Article 3.5.

**INTENTIONALLY BLANK**

## CHAPTER 2

### SAFETY PRECAUTIONS, OPERATING RESTRICTIONS AND CASUALTY PROCEDURES

#### SECTION 1 – GENERAL

##### 2.1.1 SUBMARINE OPERATING CONDITIONS

##### 2.1.2 INTRODUCTION

(NU) The submarine is a seaworthy and manoeuvrable vessel, which when fully surfaced complies with the International Regulations for Preventing Collisions at Sea. However, their construction differs from that of surface ships making them vulnerable to damage, and this must be considered, particularly when in close proximity to ASW units during exercises.

##### 2.1.3 EXTERNAL APPEARANCE

(NU) Submarines have a relatively low freeboard, smooth contours, and little superstructure; consequently, they are more difficult to detect either visually or by radar, than other ships. Furthermore, it is not easy to estimate the course of submarines visually as their inclination is difficult to determine even under the most favourable conditions.

##### 2.1.4 NAVIGATION LIGHTS

(NU) Most submarines do not carry conventional navigation lights, but are permitted to be at sea at night under the International Regulations for Preventing Collision at Sea. Their navigation lights are low and may be concentrated in the vicinity of the conning tower. This arrangement, when combined with the complete lack of other upper deck lights, may be misleading and gives a submarine at night the appearance of a much smaller ship. In accordance with the International Regulations for Preventing Collision at Sea, some countries have authorized special submarine identification lights (see Table 2-1). Many submarines are unable to display navigation lights until they have surfaced.

| Nation | All Round Rotating Beacon |                                                                                          |            |
|--------|---------------------------|------------------------------------------------------------------------------------------|------------|
|        | Colour                    | Showing (Characteristics)                                                                | Visibility |
| CAN    | Amber                     | 90 flashes per minute                                                                    | 3nm        |
| DEU    | Orange                    | ~ 100 flashes per minute                                                                 |            |
| ESP    | Amber                     | 120-180 flashes per minute                                                               |            |
| FRA    | Yellow                    | 100 to 120 flashes per minute                                                            |            |
| GBR    | Amber                     | 90 flashes per minute                                                                    |            |
| GRC    | Orange                    | ~ 80 flashes per minute                                                                  | 3nm        |
| ITA    | Amber                     | 90 flashes per minute                                                                    |            |
| NLD    | Amber                     | 90 flashes per minute                                                                    |            |
| NOR    | Amber                     | 90 flashes per minute                                                                    |            |
| POL    | Orange                    | ~ 100 flashes per minute                                                                 |            |
| POR    | -                         | 94 flashes per minute                                                                    |            |
| TUR    | Amber                     | 90 flashes per minute                                                                    |            |
| USA    | Amber<br>(Yellow)         | Intermittent flashing one flash per second for 3 seconds, followed by a 3 second period. |            |

Table 2- 1. Submarine Identification Lights (NU)

## 2.1.5 DAMAGE CONTROL

(NU) A submarine's reserve of buoyancy is low. Thus any collision or other event that causes the pressure hull or ballast tank to be pierced immediately places the submarine in danger of sinking.

## 2.1.6 HANDLING CHARACTERISTICS

(NU) Diving is a safe and routine operation for a submarine. Once submerged, a submarine is manoeuvrable and can avoid danger simply and quickly by increasing depth if there is sufficient water beneath its keel. Therefore, it is capable of taking part in all types of exercises without risk if certain rules for safety are observed by all ASW units participating in the exercise. Exercises will not be carried out in waters less than 77 meters (255 ft) unless Relaxations of the 12 series are authorized.

## 2.1.7 - 2.1.9 Spare

## 2.1.10 RESPONSIBILITIES WHEN EXERCISING WITH SUBMARINES

### 2.1.11 RESPONSIBILITY FOR AVOIDING COLLISION BETWEEN SURFACE SHIPS AND SUBMARINES

2.1.11.1. (NU) The Commanding Officer of a submerged submarine must assume that his presence is unknown to all participating units even when it may be assessed that such units hold positive sonar contact. The burden of avoiding collision, therefore, when at PD, submerged, coming to PD or surfacing, rests primarily on the submarine.

2.1.11.2. (NU) A submarine deeper than PD cannot be fully acquainted with the situation on the surface, since it must depend totally on sonar to locate ships. Surface ships, therefore, must take all possible action to ensure the safety of the submarine. Such action should include, for example:

- a. Manoeuvring to avoid a submarine sighted at close range. This may include taking way off the ship.
- b. Informing the submarine of approaching deep draught vessels, or fishing vessels. See Article 2.1.1.3.
- c. Advising the submarine when it is safe to return to PD.
- d. Informing the submarine of a significant change in the weather with particular emphasis on the visibility.
- e. Informing the submarine of towed sonar systems, decoys or obstructions (e.g. splash/spar targets) which, through system malfunction or other over-riding factors, are deeper than permitted in the CASEX rules.
- f. After STOP TIME, when inside a known submarine area, transmit sonar, cavitate or operate other acoustic warning devices.

2.1.11.3. (NU) In basic CASEXes when paragraph LL of the Order Table is specified and surface forces have to close the initial position of participating submarines(s), a circular area of 5nm radius centred on that initial position must be established one hour prior to the scheduled GO TIME. These additional measures must be taken in order to prevent collision and provide the submarine with a reliable acoustic warning of the presence of surface forces.

- a. Surface forces inside that circular restricted area must take the following measures:
  - (1) Transmit on sonar or cavitate or operate other acoustic warning devices.
  - (2) Keep a sharp lookout for the submarine.
  - (3) Maintain UWT and UHF/VHF/HF listening watch on exercise nets.
  - (4) Establish proper ESM/radar watch.
- b. OCS could relax above measures once submarine position is fixed, two-way communications are established and follow on force movements are clearly stated.

2.1.11.4. (NU) Submarines coming shallower than Safe Depth are to take all possible steps to avoid collision. If the submarine is in any doubt of surface ship positions or movements, it should remain at Safe Depth and reinitiate surfacing procedures appropriate to the relaxations in force.

2.1.11.5. (NU) Splash/spar targets are likely to be towed by surface ships up to 600 yards astern of the ship. Submarines at PD are not to approach these targets within 1000 yards. Submarines which are deep are not to come to PD within 1600 yards astern of the ships.

2.1.11.6. (NU) When the echo sounder / fathometer is being used as a submarine warning device, water depth will usually be sufficient to preclude the requirement to use an echo sounder for safe navigation. However, the echo sounder settings should maximize the opportunity for a submarine to detect the transmissions. Therefore, when used as a warning device, the echo sounder will be set at maximum power, maximum scale and, if applicable, maximum pulse length.

## 2.1.12 RESPONSIBILITY FOR THE SAFE NAVIGATION OF THE SUBMARINE

2.1.12.1. (NU) The submarine Commanding Officer has the fundamental responsibility for the safe navigation of his submarine.

2.1.12.2. (NU) In scheduled CASEXes; however, the OCE or the officer to whom he has delegated responsibility (OTC/OCS) is responsible for taking all reasonable precautions to ensure the navigational safety of the submerged submarine. In elementary CASEXes this may require frequent communication between ships and submarine.

2.1.12.3. (NU) The OCE may, on an exceptional basis, require that the submerged submarine be informed by SST or UWT of its hourly position, or more often if circumstances warrant. Changes in sea conditions or visibility should be communicated if appropriate. If it should

appear that the submarine is standing into danger, it may be desirable to bring the submarine to PD.

2.1.12.4. (NU) **Restricting Course and Speed of Submarine.** In certain elementary exercises, it is necessary to order the submarine to steer a given course and/or maintain a specified speed. These are to be taken as log speed through the water, ie. not allowing for tide or current. Ships giving such instructions (or any alterations thereto) are to ensure that the submarine will not be endangered by obeying such instructions. This in no way relieves the submarine Commanding Officer of his basic responsibility for the safe navigation of his submarine.

## 2.1.13 SUBMARINES AND FISHING VESSELS

### Note.

(NU) *These instructions detail the default policy adopted by NATO to achieve fishing vessel safety in exercises involving NATO units. NATO recognizes that there are valid national alternatives for achieving fishing vessel safety.*

2.1.13.1. (NU) Submarines dived below PD must remain at least 4000 yds clear of any fishing vessel (FV), whether it is known to be fishing or not. If, for any reason, this separation cannot be achieved then the submarine must return to PD and remain at least 1500 yds clear of all fishing vessels. (These rules can be modified using Relaxation 26\*B, 26\*C or 26\*D). If the submarine cannot maintain 1500 yds clearance at PD it must surface unless direct communications are established with the FV and the FV is in agreement with a closer pass.

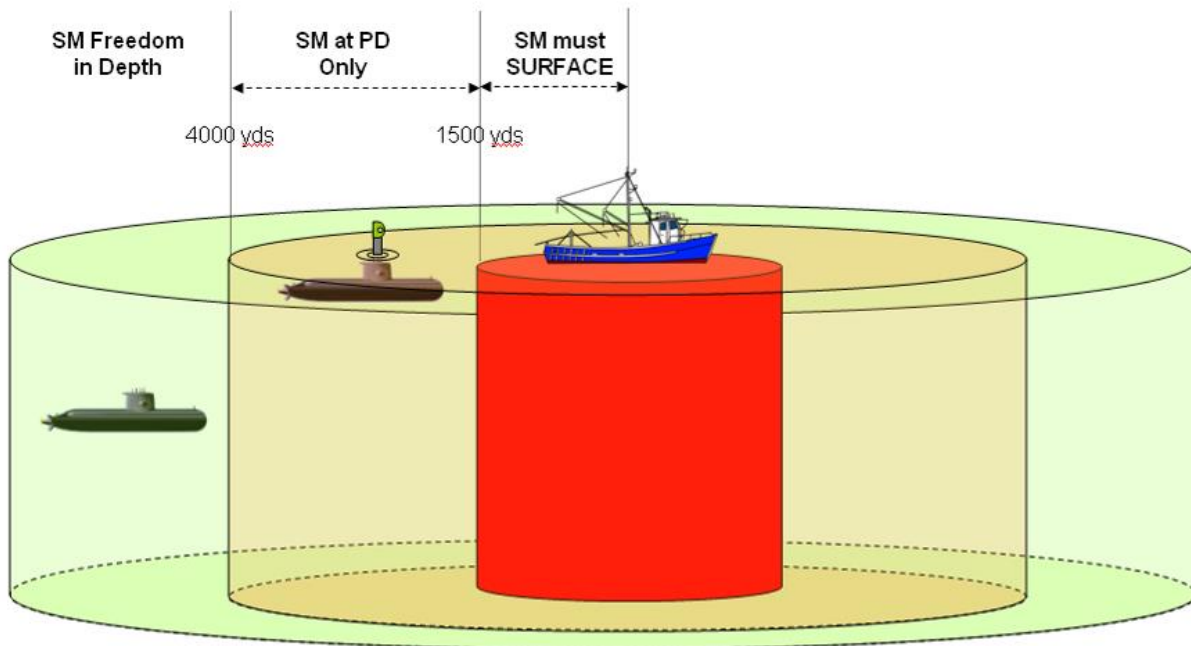


Figure 2-1. Fishing Vessel Safety (NU)

2.1.13.2. (NU) **Fishing Vessel Safety.** It is recommended that the OSE nominates a suitably equipped surface or air unit as the Fishing Vessel Safety Ship (FVSS) for all CASEX serials in or

near areas of FV activity. All units involved in a CASEX, and aware of the presence of FV, are to ensure the submarine is informed of the presence of the FV in the area and the FV is advised of the submarine activity, coordinated through the FVSS, if assigned.

2.1.13.3. (NU) The aim of establishing the FVSS is to:

- a. To provide assistance to the participating submarine to compile its plot of FV activity in order to minimize the risk of interaction.
- b. To make FV aware of submarine exercise activity in their vicinity and to provide a source of information and advice to minimize the risk of interaction.

2.1.13.4. (NU) **FVSS Duties.** The FVSS is to:

- a. Maintain as comprehensive a surface plot of fishing activity in the exercise area as is possible in the prevailing conditions throughout the exercise. This is to be compiled from onboard sensors and from the reports of other assets involved in the exercise.
- b. At GO TIME, within the first 15 minutes, make several blind broadcasts of the FV activity to the submarine on a suitable pre-ordered voice circuit (promulgated in the CASEX TABORD). To assist the Submarine CO in making his overall assessment, this broadcast is to include a confidence level (LOW/MED/HIGH) as an indication of accuracy and completeness in the light of prevailing conditions (visibility / weather / radar and sonar performance).
- c. Retransmit the current surface picture of FV activity at any other time during the serial if requested to do so by the submarine. The submarine is to liaise before the exercise, depending on the scenario, if further set broadcast times are required.
- d. Act as communications link with FV in the exercise area. If the FVSS is not best placed to do this, the task may be delegated to a better-placed unit. Before the serial start the FVSS should transmit an initial Sécurité call on VHF #16 including a nominated working IMM channel. The FVSS is to maintain watch on the nominated channel throughout the exercise.

**‘SECURITÉ SECURITÉ SECURITÉ, ALL STATIONS ALL STATIONS ALL STATIONS, THIS IS, WARSHIP (*identity*) X 3. FOR INFORMATION CONCERNING SUBMARINE OPERATIONS IN (*general description of the geographical area*) LISTEN ON VHF CHANNEL #\*\* OUT’.**

- e. A full Sécurité warning should then be transmitted on the allocated working channel stating that submarine exercises are about to take place in the area, the call sign of the FVSS and the calling channel for FV to request further information if in close proximity to the warships. Communications with FV should be aimed at promoting confidence between the military and the Fishing Industry. Consideration should be given to the language spoken in the local area.

**‘SECURITÉ SECURITÉ SECURITÉ, ALL STATIONS X 3, THIS IS, WARSHIP (identity) X 3, WARSHIPS WILL BE EXERCISING WITH A SUBMARINE IN (general description of the geographical area) FOR THE NEXT \*\* HOURS. FISHING VESSELS IN THE VICINITY OF WARSHIPS AND REQUIRING FURTHER INFORMATION SHOULD CALL WARSHIP (identity) ON THIS CHANNEL. OUT’.**

2.1.13.5. (NU) **Exercise Participants.** All exercise participants are required to support the FVSS by:

- a. Providing the FVSS with information of fishing activity in their vicinity.
- b. Warning any FV detected approaching the area that submarine exercises are being conducted in the vicinity.
- c. Warning the submarine of any FV within 6000 yards of the warship using PROCEDURE HOOKER (unless RELAXATION 26\* has been approved) and by other means if the situation demands.
- d. Warning the submarine when it is considered that a close-quarters situation is developing and that a FV could be within 4000 yards of a submarine by use of PROCEDURE UNIFORM.

2.1.13.6. (NU) **Submarine.** The submarine Commanding Officer (CO) must not rely upon this service alone and therefore is required to:

- a. Maintain a comprehensive plot of all fishing activity affecting the submarine's exercise areas, supplemented by the FVSS broadcast for that exercise.
- b. Always consider the use of radar to support information from other sensors when compiling the plot. Radar is to be used when directed in the exercise instructions or whenever the CO considers it necessary for safety, regardless of the exercise instructions.
- c. Receipt of the FVSS broadcast should be acknowledged where possible and in any event a note of its receipt should be recorded in the Control Room log.
- d. Carry out the correct actions on receipt of UNIFORM.

## 2.1.14 PROCEDURE UNIFORM

2.1.14.1. (NU) When any participating unit considers that a close quarters situation may be developing and that a fishing vessel may close, or already be, within 4000 yards of a deep submarine, the following procedure is to be followed:

- a. Contact the fishing vessel on VHF and warn him of the position of the submarine.
- b. Consider ordering sonar silence to facilitate UWT communication.

- c. Transmit '**UNIFORM UNIFORM UNIFORM**' on UWT for 2 minutes and repeat 1 minute later. Also, if available drop an ESUS set to Code 5.
- d. Inform other units of the situation, and order ships to cavitate and steer the SAFETY COURSE (or reciprocal) to aid the submarine in its return to PD.
- e. The submarine, on hearing the warning signal is to mark position with a white smoke or candle, clarify the plot, return to PD and establish communications with the nearest unit without delay.
- f. When safety separation has been re-established, the serial or ASW action can recommence.

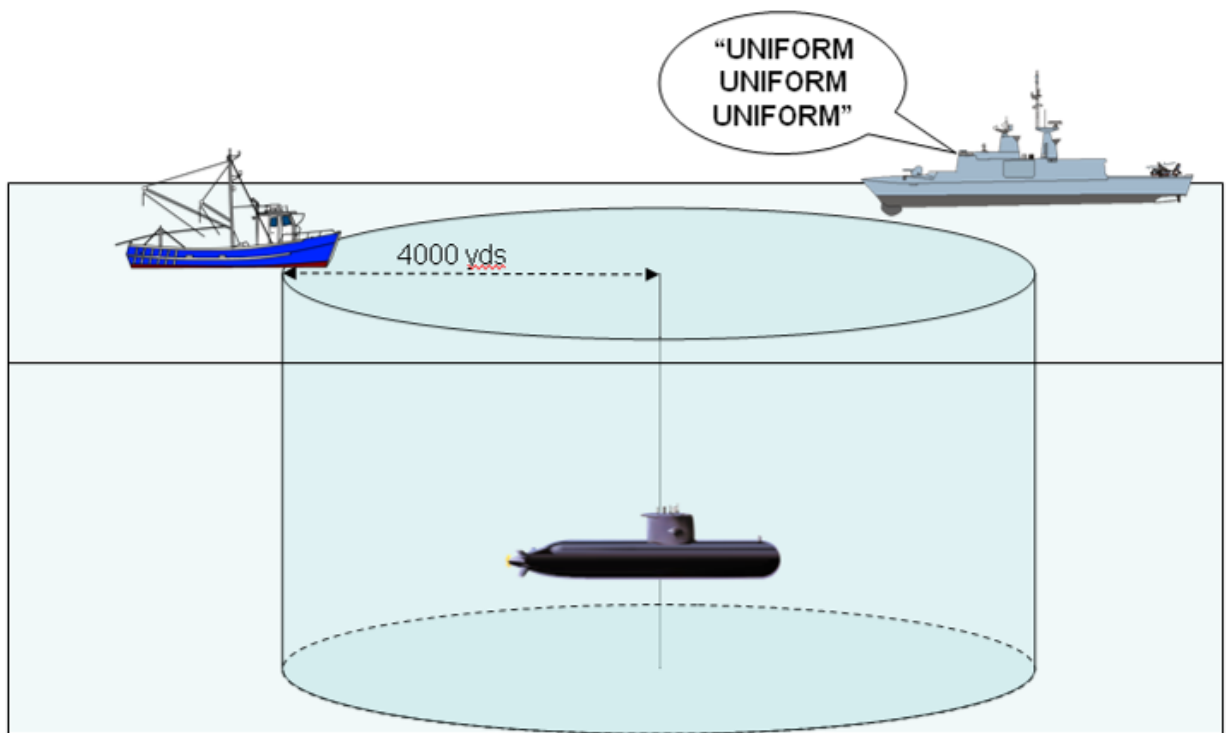


Figure 2-2. Procedure UNIFORM (NU)

## 2.1.15 PROCEDURE HOOKER

2.1.15.1. (NU) To assist submarines in identifying FV and maintaining the separation distances, participating units are to inform submarines whenever a FV approaches within 6000 yards of the ship or ranges as stated in Relaxation 26\*C.

- a. The ship should first strangle MRS or reduce MRS to low power, to allow clear receipt of the message.
- b. The message is to be passed on UWT using code word "HOOKER" repeated 3 times followed by the cardinal sector (N/E/S/W) of the FV from the ship,

e.g. “[SM CALLSIGN] THIS IS [SHIP CALLSIGN] – **HOOKER, HOOKER, HOOKER, WHISKEY**” – meaning there is a FV to the West of me (ship) within 6000 yards.

- c. If the position of the submarine is known with certainty the UWT message YBA (Table 5-4) may be used. Furthermore, if a FV is assessed to be within 4000 yards of the submarine PROCEDURE UNIFORM is to be conducted and take precedence.
- d. The message should be repeated at intervals not exceeding 2 minutes (until the FV is outside 6000 yards).
- e. The submarine will not acknowledge the message, unless further information is required.
- f. VHF Calls to FV. Consideration should always be given to calling the fishing vessel on VHF to warn of the presence of submarines in his vicinity. Prior warning of submarine activity may gain cooperation and thus obviate the need to disrupt ASW play. Ship Commanding Officers should take a personal interest in this aspect and brief their bridge teams accordingly.
- g. This procedure will not always be suitable for advanced CASEX or in ocean scenarios. If the procedure Hooker is not considered applicable, the OTC may request Relaxation 26\*A (see para below). It is emphasized that this relaxation will be used infrequently.
- h. The submarine must not rely upon this service alone for FV safety.

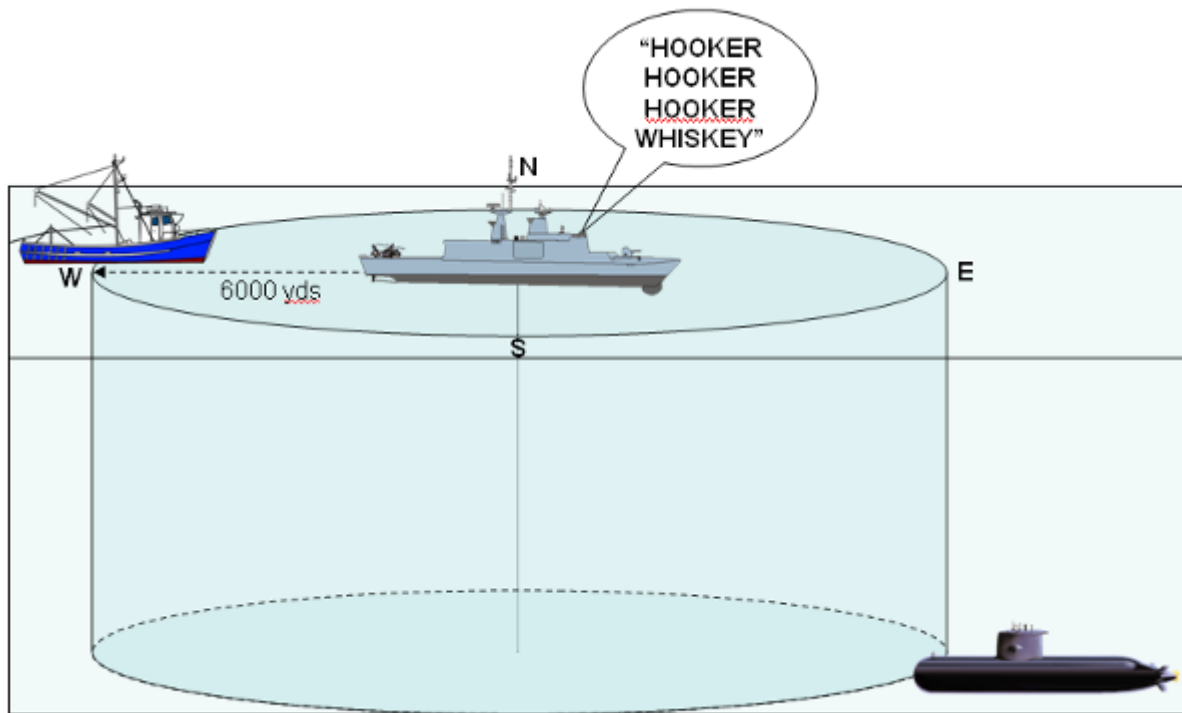


Figure 2-3. Procedure HOOKER (NU)

### 2.1.16 SONAR PROTECTIVE MEASURES

2.1.16.1. (NU) Notwithstanding any guidance in this section (e.g. if any Relaxation 7 or 8 series are in force), the safety of exercise participants shall always be paramount.

2.1.16.2. (NU) NATO policy (MC 0547) requires implementing appropriate protective measures to ensure the protection of marine mammals within the framework of Alliance maritime activities. A risk mitigation assessment should be conducted as part of planning. Generally, a risk mitigation assessment is a review of primary marine mammal locations, environment protected areas and any other considerations that may be necessary based on known high probability environmental factors. Consistent with essential training requirements, Navy units should avoid training with active sonar in areas where they will encounter conditions which in their aggregate may contribute to a marine mammal stranding event. These conditions include: strong surface duct, significant bathymetry (steep or complex bathymetric features such as the continental shelf break, seamounts and canyons), use of multiple sonar over periods of time and constricted channels or limited egress for marine mammals. If the situation arises that units must conduct training / exercises under such conditions they shall, if practicable, seek prior approval from their appropriate chain of command or at least act in accordance with national procedures.

2.1.16.3. (NU) These protective measures emphasize the use of trained lookouts and visual survey capabilities. Therefore, when possible, plan to conduct training during daylight hours. In the event exercises will be conducted at night, maximize use of passive acoustic monitoring radar and/or night vision equipment to survey for protected species, coral reefs, and to clear the target or other relevant area.

2.1.16.4. (NU) In all cases the following protective measures apply.

- a. Surface units shall use trained lookout(s) to survey for marine mammals (whales, dolphins, sea lions, etc.) and sea turtles prior to commencement and during the exercise.
- b. Submarines shall monitor acoustic detection devices for indications of close aboard marine mammals (high bearing rate, biologic contacts).
- c. When a surface combatant or a submarine conducting active sonar training detects a marine mammal near a ship, it shall reduce sonar transmission level to avoid harassment or secure sonar transmissions. Ships and submarines will continue to limit ping levels until they assess the marine mammal is no longer at risk. Should the marine mammal be detected in close proximity, consider securing active sonar transmissions.

**Note.**

*At close range, the principal risk to the mammal changes from acoustic harassment to one of potential physical injury from collision. Accordingly, ships and submarines shall exercise prudent seamanship and manoeuvre to avoid collision to the degree possible consistent with safety of the vessel.*

2.1.16.5. (NU) Special conditions applicable for dolphins and porpoises only: If after conducting an initial manoeuvre to avoid close quarters with dolphins or porpoises, the ship or submarine concludes that dolphins or porpoises are deliberately closing on ship to ride the vessel's bow wave, no further mitigation actions are necessary. While in the shallow wave area of the vessel's bow, dolphins or porpoises are out of the main transmission axis of the mainframe active sonar and only exposed to significantly lower power levels.

## **2.1.17 HELICOPTER DIPPING SONAR PROTECTIVE MEASURES**

(NU) Sonar dipping helicopters shall not go active when marine mammals or sea turtles are detected in close proximity to the sonar transducer. If a marine mammal or sea turtle is detected in this area while the helicopter has its sonar pinging actively, the helicopter is to secure pinging.

## **2.1.18 EXPLOSIVE ECHO RANGING (EER) PROTECTIVE MEASURES**

(NU) Do not conduct unless water depth is sufficient (normally more than 200 meters). In addition do not conduct exercises near or within marine mammal sanctuaries and known marine mammal breeding areas. EER deploying aircraft shall survey the area for marine mammals (whales, dolphins, sea lions, etc.) and sea turtles prior to and during exercises. For location specific protective measures, consult your chain of command.

## **2.1.19 – 2.1.99 Spare**

## SECTION 2 - SAFETY AND THE CONDUCT OF UNITS DURING ASW EXERCISES

### 2.2.1 EMERGENCIES DURING ASW EXERCISES

2.2.1.1. (NU) During ASW exercises involving ships, submarines, and aircraft, prescribed safety precautions are to be observed to the fullest extent possible. The OTC/OCE is responsible for ensuring that such precautions are observed and, in the event of a major accident, for determining whether an exercise is to be continued.

2.2.1.2. (NU) It is the responsibility of the OSE to ensure that full details of the procedures to be carried out in the event of an aircraft or submarine accident are known to all forces taking part in an exercise.

2.2.1.3. (NU) ATP-10 / ATP-57 and IAMSAR (International Aeronautical and Maritime Search and Rescue) Manuals together contain full details of Search and Rescue procedures and equipment for the event of an aircraft or submarine casualty. The procedures set forth in this article should be supplemented by current National Search and Rescue instructions within appropriate search and rescue areas.

### 2.2.2 AIRCRAFT EMERGENCIES

2.2.2.1. (NU) **Aircraft Incident.** The following conditions indicate an imminent or actual distress incident:

- a. The position of an aircraft raises doubt as to its safety.
- b. Reports indicate that the operating efficiency of an aircraft is so impaired that a forced landing may be necessary.
- c. An aircraft is overdue or unreported.
- d. An aircraft is reported to have made a forced landing or is about to do so.
- e. The crew is reported to have abandoned an aircraft or is about to do so.
- f. Emergency IFF is received at any station.
- g. An aircraft emergency Link 11 message is received.
- h. Aircraft MAYDAY or PAN calls are heard.

2.2.2.2. (NU) **Action by Aircraft.** In the event of an aircraft emergency that requires breaking off the exercise, or raises the possibility of a forced landing, the decision for the action to be taken rests entirely with the Aircraft Commander. Normally one of the following procedures will be carried out:

- a. Crew and passengers may immediately parachute from the aircraft.

- b. An immediate forced landing in the sea may be made near a ship or surfaced submarine.
- c. A deferred or forced landing may be made on or near land.
- d. A deferred landing may be made at a shore or carrier base.

2.2.2.3. (NU) **Action by the On-Scene Commander.**

- a. When an aircraft casualty occurs in the exercise area, the On-Scene Commander is normally responsible for initiating Search and Rescue action and for informing the authority exercising operational control of the aircraft. Rescue operations should be coordinated through the appropriate Rescue Coordination Centre (RCC), using such forces as are necessary.
- b. If a casualty makes it necessary for an aircraft to break off the exercise and carry out one of the procedures listed in paragraph 2 above, the On-Scene Commander may at his discretion cause the exercise to be terminated, or interrupted, and may surface any submerged submarine in the vicinity.

2.2.2.4. (NU) **Action by Submarines.** In single aircraft/submarine exercises the Air Commander is responsible for the safety of the aircraft and for initiating Search and Rescue action. Submarines detecting any indication of an aircraft incident (paragraph 1 above) should immediately establish communications with the appropriate RCC.

2.2.2.5. (NU) **Use of Distress Signals**

- a. Table 5-8 contains aircraft distress signals. The table details the nature of the aircraft emergency, the distress signals the aircraft is to make and the action to be taken by a ship or submarine to effect rescue as quickly as possible.
- b. Helicopters may ditch suddenly without having time to make distress signals. Ships should, therefore, keep cooperating helicopters under constant observation when possible.

**2.2.3 SUBMARINE EMERGENCY**

2.2.3.1.(NU) Detailed instructions for Search and Rescue Operations, which are conducted as a result of the loss or apparent loss of a submarine, are contained in ATP-10 / ATP-57, IAMSAR and appropriate national instructions.

2.2.3.2. (NU) **The Aim of Rescue Forces.** In the event of a submarine accident, the aim of ships will be to fix the position of the submarine accurately and, if possible, to buoy this position for rescue operations. This ensures that Explosive Charge Signal A12 (Table 5-2) can be made no closer than 500 yards from the submarine to indicate that ships are standing by to pick up survivors. ASW aircraft should be employed to assist the rescue ships in such operations.

## 2.2.4 SUBMARINE SURFACING IN AN EMERGENCY

2.2.4.1. (NU) All ASW units must be prepared for the possibility that a submarine may have to surface in an emergency, possibly without the appropriate signal. A Red Pyrotechnic Signal (Signal B4 in Table 5-3) released by a submarine indicates that it is surfacing or is about to surface in an emergency:

- a. The sighting of this signal is a sign that the submarine is about to surface and may, in fact, already be coming to the surface. Table 5-3 contains action to be taken by ASW units.
- b. If Red signals are repeated or if the submarine fails to surface within a reasonable time, it must be assumed to be disabled. The On Scene Commander is to coordinate marking the SM position, attempt communication by sonar, by UWT, or by tapping the hull, and look for a submarine marker buoy. Naval authorities are to be advised of the emergency.
  - (1) In addition to launching the Red Emergency Identification Signal, the submarine will, if possible, repeatedly transmit the International Distress Signal -"SOS"- on UWT or SST.
  - (2) A submarine which fires a Red Pyrotechnic Signal must surface even if the Red Pyrotechnic Signal was fired by accident or if the reason for firing no longer applies.
- c. If an unexpected signal is sighted by ASW Units, they are to anticipate emergency surfacing and are to act accordingly by clearing the area and taking actions contained in Table 5-3 corresponding to signal B4 until the submarine surfaces or other direction is received.

## 2.2.5 - 2.2.9 Spare

## 2.2.10 BASIC SAFETY RULES, PROCEDURES AND REQUIREMENTS

## 2.2.11 SAFETY SEPARATION OF ASW FORCES

(NU) To avoid mutual interference; submarines, ships and dipping helicopters will be separated by horizontal and /or vertical safety separation.

## 2.2.12 HORIZONTAL SAFETY SEPARATION

2.2.12.1. (NU) Unless Relaxation 12\*G has been authorized, submarines should not approach within 2nm of the limits of their areas. This will achieve a 4nm horizontal safety separation between submarines operating in adjacent areas. This separation distance may be modified by the Relaxation 12\*G for certain exercise areas to accommodate variances in the size and/or environmental conditions in the exercise area.

2.2.12.2. (NU) Submarines are to remain 2nm clear or at a distance considered safe by the submarine Commanding Officer, from underwater hazards such as wrecks, pinnacles or pipelines, where water depth is insufficient to allow minimum safe depth operations above the

hazard. This rule should be taken into careful consideration when planning the location of exercise STOVEPIPES and SKYLIGHTS or submarine lanes.

2.2.12.3. (NU) Submerged submarines observed to be approaching the limits of their areas or towards an obstruction are to be advised of the hazard and if necessary given a safe course to steer. Submarines unable to remain within their assigned areas are to surface. During more advanced ASW exercises, when exercise unit movements are unrestricted, the OTC/OCS will not always be able to establish the submarine's position. Therefore, the responsibility for the submarine to remain within assigned exercise areas rests with the submarine's Commanding Officer.

2.1.12.4. (NMM) NOT RELEASABLE.

Figure 2-4. (NMM) NOT RELEASABLE

## 2.2.13 SAFETY PRECAUTIONS WHEN DEPLOYING VDS/TAS/MTAS

2.2.13.1. (NU) The definitions below refer to ASW exercises and submarine safety:

- a. **Towed Array System.** An acoustic system which uses a line of hydrophones located in an array towed by surface ships and submarines.
- b. **“Hard” Sonar Systems.** These systems cannot be in the same depth zone as a submarine and therefore a vertical safety separation (UVSS) must be applied.
  - (1) **Variable Depth Sonar (VDS).** A sonar whose transducer is towed at variable depths beneath the parent ship. The transducer cannot be in the same depth zone as a submarine (a UVSS must be applied). See Table 2-6A.
  - (2) **Depressed Towed Array System (DTAS).** A towed array system which is taken to desired depth by a towed body or depressor. The body or depressor makes this a “hard” system which cannot be in the same depth zone as a submarine (a UVSS must be applied).
  - (3) **Multiple Towed Array System (MTAS).** A system that involves the simultaneous towing of multiple bodies with different characteristics (CATAS with VDS/DTAS). For example a VDS transmitter and CATAS receiver. These bodies may have different length tows and operate at different depths. A safety separation must be applied between the depth of the hard body and the submarine (with UVSS), the CATAS may be in the same depth zone as a submarine, subject to SUBOPAUTH approval.
- c. **“Soft” Sonar Systems.** These systems may, subject to SUBOPAUTH approval, be in the same depth zone as a submarine and therefore vertical safety separation is generally not required. In CASEXs which deliberately promote

close quarters interaction (eg. a CARTWHEEL) the SUBOPAUTH may impose a UVSS within a safety range of the towing ship.

(1) **Critical Angle Towed Array System (CATAS).** A towed array system whose depth is dependent upon towing ship speed and the length and weight of the towed cable only. This is generally a “soft” array which may be in the same depth zone as a submarine, subject to SUBOPAUTH approval. See Table 2-6B.

(2) **Submarine Towed Array System (STAS).** A towed array system where a neutrally buoyant array is deployed directly astern of the submarine and at the same depth. This is a special case of CATAS and is not necessarily differentiated.

(3) **Helicopter Dipping Sonar.** A sonar system lowered to optimum depth by an MPH. For the purposes of PMI this is considered to be a “soft” sonar system which may be in the same depth zone as a submarine. MPH will generally conduct the initial search at a shallow depth (eg. 20 m) or carry out other appropriate actions such as spitting a sonobuoy to ensure safe operations.”

- d. **Other Systems.** There may be other systems that do not naturally fall in to one of the above categories. The SUBOPAUTH is to determine how these systems may be defined.

**Notes:**

1. *Throughout this article the term “towed array” is used to describe any form of towed array system.*
2. *The terms TACTAS and SURTAS are for operational use and are defined in the Glossary.*

2.2.13.2. (NU) General

- a. For general exercise planning purposes, Table 2-5 indicates the principal authorizations for use of specific VDS/DTAS/MTAS against submarines of the different nationalities, shown in Column 3, as follows:

|          |                                                                                         |
|----------|-----------------------------------------------------------------------------------------|
| <b>A</b> | May be used without restriction;                                                        |
| <b>B</b> | May be used with rules and relevant relaxations specified in this article and Table 3-2 |
| <b>C</b> | May not be used.                                                                        |

- b. When authorization B is appropriate (Table 2-5), the type of VDS/DTAS/MTAS to be used and the maximum allowed cable length to which it may be streamed must have the prior approval of the SUBOPAUTH. In the case of MTAS, the length of tow for the VDS/DTAS with the longest cable length should be specified. In the interest of realism in advanced ASW exercises, the OCE may request relaxation of VDS/DTAS/MTAS restrictions as approved by the SUBOPAUTH (Table 3-2, Relaxation 8 Section).

- c. The OCE must ensure that the VDS/DTAS/MTAS specified depth of cable length does not conflict with the limitations imposed by Article 2.2.13 - Vertical Safety Separation/Safe Depth Operation.
- d. The exercise scheduled, type of submarine assigned, and practice weapons to be employed may impose additional restrictions on the operating depth of the submarine. In specifying the maximum depth or cable length of the VDC/DTAS/MTAS, the OCE must ensure that the specific depth or cable length does not conflict with the limitations imposed by:
  - (1) Article 2.2.14 - Vertical Safety Separation/Safe Depth Operation;
  - (2) Article 2.2.39 - The Use of Explosive Charges; and
  - (3) (NMM) NOT RELEASABLE
- e. The OCE shall ensure that the following information is promulgated in the appropriate operation order or exercise directive:
  - (1) Name, Hull Number, Active Sonar frequency and Signal Designator of type VDS/TAS/MTAS (Table 2-6) of each VDS/Towed Array ship in the exercise;
  - (2) Specific exercise events in which VDS/TAS/MTAS is to be streamed;
  - (3) All the appropriate SUBOPAETH approved relaxations marked with an asterisk (\*) (Table 3-2, Relaxation 8 Section); and
  - (4) Instructions for disposition of the VDS/TAS/MTAS during the submarine surfacing procedure, if other than those described in Articles 2.2.73 and 2.2.74, should national policies so require (Table 3-2, Relaxation 8\*G).
- f. The fact that VDS/TAS/MTAS is to be streamed must always be included in the orders for the exercise, together with the Signal Designator of the type VDS/TAS/MTAS (Table 2-6). Table 3-2, Relaxation 8 Section applies to the use of VDS/TAS/MTAS.

**2.2.13.3. (NU) Additional Restrictions**

- a. When one or both components of MTAS consists of a VDS or DTAS the additional restrictions covering VDS/DTAS should be applied.
- b. When VDS/DTAS is employed using vertical safety separation, see Article 2.2.36 for additional safety precautions and restrictions.
- c. When VDS/DTAS is employed using horizontal safety separation, see Article 2.2.37 for additional safety precautions and restrictions.
- d. When CATAS is employed, see Articles 2.2.38, 2.2.73 and 2.2.74 for additional safety precautions and restrictions.

- e. If the VDS/DTAS/MTAS system is not featured within Table 2-6, the parameters are to be featured in the CASEX standard orders and the SUBOPAUTH must authorize its use with participating submarines.

## 2.2.14 VERTICLE SAFETY SEPARATION/SAFE DEPTH OPERATION

2.2.14.1. (NU) **Safe Submarine and Water Depths.** The Vertical Safety Separations are not adequate for major casualties, but can be used for planning when inadvertent loss of depth control is the only consideration. For submarines operating in shallow water areas, e.g., southern North Sea, the use of the 12 Series Relaxations is mandatory. It may be necessary to augment these relaxations with exercise instructions in accordance with Table 3-3 and special instructions in accordance with Article 3009. The ordering of a CASEX in shallow water areas requires special care and knowledge of all relevant paragraphs of this publication by the OCE/OCS and the SUBOPAUTH. The minimum charted depth of water for an exercise can be calculated from Columns B, C, D and F, and is listed in Table 2-2, Column G. Graphic illustration of submarine safe depth calculations is shown in Figure 2-5. Special tables will be provided by the SUBOPAUTH for submarines operating in shallow water areas, e.g. the Baltic.

2.2.14.2. (NU) **Safe Bottoming Areas.** The regulations on minimum depth of water in which submarines may bottom may be relaxed on order of the SUBOPAUTH. Prior to any bottoming exercises, specific approval for use of specific submarines and bottoming areas must be obtained from the SUBOPAUTH (Relaxation 12\*F).

2.2.14.3. (NU) **Upper Vertical Safety Separation (UVSS).** This is the vertical distance which must be maintained between the top of the fixed structure of the submarine and the lowest point of any ship, other submarine assigned to a higher layer, towed ASW device and helicopter sonar systems allowed in the orders for the exercise. This Upper Vertical Safety Separation is the same for submarine vs. submarine, submarine vs. ship, submarine vs. VDS or towed decoy. When this safety separation in depth exists, the submarine is said to be at Submarine Safe Depth. This safety separation is speed dependant and is listed in Table 2-2, Column E. Safety rules for depth separation of FRNFOR and OPFOR submarines and rules for the employment of towed sonar systems and decoys will have to be worked out for each separate exercise. These rules will vary with each type of exercise, depth of water in exercise area, types of ships and submarines participating and relaxations (Table 3-2) approved.

2.2.14.4. (NU) **Bottom Vertical Safety Separation (BVSS).** This is the vertical distance which must be maintained between the lowest fixed part of the submarine and the sea bed. This safety separation is speed dependent and is listed in Table 2-2, Column F.

2.2.14.5. (NU) **Lower Vertical Safety Separation (LVSS).** This is the depth of water required between the keel of the submarine and the Maximum Permissible Operating Depth. The Maximum Permissible Operating Depth is defined as an absolute depth for an individual submarine below which that submarine must not deliberately proceed. The LVSS is speed dependent and is listed in Table 2-2, Column H.

2.2.14.6. (NU) **Speed.** Submarine Safe Depth and Vertical Safety Separations in Table 2-2 are all dependent on the maximum speed of the submarines participating in the exercise. CASEX TABORDs are to specify the maximum speed for submarines using INSTRUCTION 120 "Speeds are not to exceed (.....) knots" in Paragraph T (Exercise Instructions –

FRNFOR/OPFOR). Use of INSTRUCTION 120 has to be coordinated between the Authority responsible for TABORDs and the SUBOPAUTH.

| DEPTH LIMITATION TABLE    |            |              |                                  |             |                                  |             |                                   |              |                                        |      |         |                                  |             |
|---------------------------|------------|--------------|----------------------------------|-------------|----------------------------------|-------------|-----------------------------------|--------------|----------------------------------------|------|---------|----------------------------------|-------------|
| A                         | B          | C            | D                                |             | E                                |             | F                                 |              | G                                      |      |         | H                                |             |
| Submarine Characteristics |            | Ship's Draft | Upper Vertical Safety Separation |             | Submarine Safe Depth (B + C + D) |             | Bottom Vertical Safety Separation |              | Minimum Charted Depth of Water (E + F) |      |         | Lower Vertical Safety Separation |             |
|                           | Note 1     | Note 2       | Note 3                           |             | Notes 3 & 7                      |             | Note 4                            |              | Note 5                                 |      |         | Notes 6 & 8                      |             |
| Assoc Relaxation          | 12*A       | 12*B         | 12*C                             |             |                                  |             | 12*D                              |              |                                        |      |         | 12*E                             |             |
| Speed                     | Height     |              | X                                | Y           | X                                | Y           | X                                 | Y            | Metres                                 | Feet | Fathoms | X                                | Y           |
| kts                       | m (ft)     | m (ft)       | m (ft)                           | m (ft)      | m (ft)                           | m (ft)      | m (ft)                            | m (ft)       | m                                      | ft   |         | m (ft)                           | m (ft)      |
| 2 - 8                     | 20<br>(66) | 30<br>(98)   | 12<br>(40)                       | -           | 62<br>(205)                      | -           | 15<br>(50)                        | -            | 77                                     | 255  | 45      | 0                                | 0           |
| 8 - 10                    | 20<br>(66) | 30<br>(98)   | 15<br>(50)                       | 12<br>(40)  | 65<br>(215)                      | 62<br>(205) | 27<br>(90)                        | 21<br>(70)   | 92                                     | 300  | 50      | 0                                | 0           |
| 10 - 12                   | 20<br>(66) | 30<br>(98)   | 18<br>(60)                       | 14<br>(45)  | 68<br>(225)                      | 64<br>(210) | 37<br>(120)                       | 27<br>(90)   | 105                                    | 345  | 60      | 0                                | 0           |
| 12 - 14                   | 20<br>(66) | 30<br>(98)   | 21<br>(70)                       | 15<br>(50)  | 71<br>(235)                      | 65<br>(215) | 50<br>(165)                       | 38<br>(125)  | 121                                    | 395  | 65      | 15<br>(50)                       | 0           |
| 14 - 16                   | 20<br>(66) | 30<br>(98)   | 24<br>(80)                       | 18<br>(60)  | 74<br>(245)                      | 68<br>(225) | 66<br>(220)                       | 49<br>(160)  | 140                                    | 460  | 75      | 30<br>(100)                      | 15<br>(50)  |
| 16 - 18                   | 20<br>(66) | 30<br>(98)   | 27<br>(90)                       | 20<br>(65)  | 77<br>(255)                      | 70<br>(230) | 81<br>(265)                       | 61<br>(200)  | 158                                    | 520  | 85      | 58<br>(190)                      | 39<br>(130) |
| 18 - 20                   | 20<br>(66) | 30<br>(98)   | 30<br>(100)                      | 21<br>(70)  | 80<br>(265)                      | 71<br>(235) | 99<br>(325)                       | 75<br>(245)  | 179                                    | 585  | 100     | 75<br>(245)                      | 61<br>(200) |
| 20 - 22                   | 20<br>(66) | 30<br>(98)   | 33<br>(110)                      | 23<br>(75)  | 83<br>(275)                      | 73<br>(240) | 116<br>(380)                      | 87<br>(285)  | 199                                    | 655  | 110     | 82<br>(270)                      | 70<br>(230) |
| 22 - 24                   | 20<br>(66) | 30<br>(98)   | 36<br>(120)                      | 24<br>(80)  | 86<br>(280)                      | 74<br>(245) | 136<br>(445)                      | 102<br>(335) | 222                                    | 730  | 120     | 90<br>(295)                      | 76<br>(250) |
| 24 - 26                   | 20<br>(66) | 30<br>(98)   | 39<br>(130)                      | 27<br>(90)  | 89<br>(295)                      | 77<br>(255) | 156<br>(510)                      | 118<br>(385) | 245                                    | 805  | 135     | 94<br>(310)                      | 82<br>(270) |
| 26 - 28                   | 20<br>(66) | 30<br>(98)   | 42<br>(140)                      | 29<br>(95)  | 92<br>(300)                      | 79<br>(260) | 174<br>(570)                      | 133<br>(435) | 266                                    | 875  | 145     | 101<br>(330)                     | 87<br>(285) |
| 28 - 30                   | 20<br>(66) | 30<br>(98)   | 45<br>(150)                      | 30<br>(100) | 95<br>(310)                      | 80<br>(265) | 194<br>(635)                      | 145<br>(475) | 289                                    | 950  | 160     | 104<br>(340)                     | 91<br>(300) |

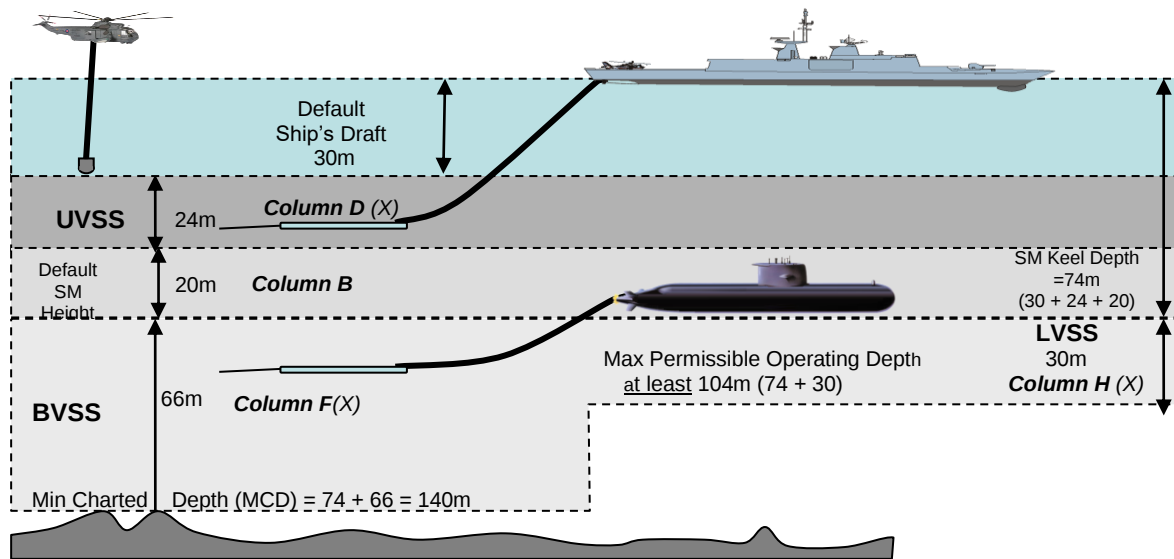
Table 2-2. Depth Limitation Table (NU)

**Notes.**

1. (NU) Submarine Height (base of keel to top of fin) (Column B) is always assumed to be 20 m (66 ft) unless otherwise ordered by SUBOPAETH (by the use of Relaxation 12\*A).
2. (NU) Ship's Draft (Column C) is assumed to be 30 m (98 ft) but this may be reduced with the prior approval of the SUBOPAETH by the use of Relaxation 12\*B. Columns E and G are then reduced accordingly.

3. (NU) *The UVSS (Column D) figures in Column X may be reduced to those in Column Y (or may be reduced to figures between brackets) for speeds as indicated at the discretion of the SUBOPAUTH by the use of Relaxation 12\*C.*
4. (NU) *The BVSS (Column F) figures in Column X may be reduced to those in Column Y (or may be reduced to figures between brackets) for speeds as indicated at the discretion of the SUBOPAUTH by the use of the Relaxation 12\*D. Subject to national operating restrictions of certain submarines.*
5. (NU) *The Minimum Charted Depth (MCD) (Column G) of water will vary depending on the relaxations affecting Columns E and F.*
6. (NU) *The LVSS (Column H) figures in Column X may be reduced to those shown in Column Y or may be reduced to figures between brackets for speeds as indicated at the discretion of the SUBOPAUTH by the use of Relaxation 12\*E.*
7. (NU) **Helicopter Sonars.** *Relaxation 8D may be used to define the maximum depth of the helicopter dipping sonar.*
8. (NU) **Towed Bodies and Sonar Systems.** *When relaxations are ordered which permit the towing of VDS/DTAS/MTAS, decoys etc. to a depth greater than that used in Column C, that figure is to be disregarded. In its place is to be substituted, in the case of VDS the maximum cable length to be used; and in the case of decoys etc., the maximum depth taken from Table 2-3. In such case the figures in columns E and G must then be adjusted to a correspondingly greater.*
9. (NU) *Subject to SUBOPAUTH restrictions, submarines are not to proceed below 5 kts at their maximum permissible operating depth.*
10. (NU). *All calculations are in metres. The figures in feet are rounded to the nearest five feet except for Submarines Height (Column B) and Ship's Draft (Column C).*

2.2.14.7. Figures 2.5 demonstrates the calculation of Safe Depth for a Submarine (14-16 kts) when the default values of 30m Ship's Draft and 20 m Submarine Height and relaxations are granted affecting the vertical safety separation. Note that although the surface ship has deployed a "soft" towed array (CATAS), it does not affect the calculation of submarine safe depth.



Example worked for 16kts using Column 'X'

Figure 2-5. Vertical Safety Separation Calculation using Column X (NU)

2.2.14.8. (NU) **Column X vs Column Y.** When approving CASEX instructions and orders it is incumbent on the SUBOPAUTH to determine whether the Sub-Column X or Sub-Column Y values from Table 2-2 should be used in calculating UVSS (Column D), Submarine Safe Depth (Column E), BVSS (Column F) and LVSS (Column H). The default is Sub-Column X. In making the decision to choose between Sub-Columns X & Y, the SUBOPAUTH should consider the Operational Capability and experience of each participant specifically with regard to recent ASW exercise participation. Column Y values are authorized by use of the following 12\* Relaxations from Table 3-2:

12\*C UVSS, 12\*D BVSS and 12\*E LVSS

Submarine Safe Depth is calculated from Submarine Height (Column B), Ship's Draft (Column C) and UVSS (Column D). Column Y Safe Depths are automatically applied when Column Y values are approved for UVSS. Figure 2-6 demonstrates how much the water column can be compressed by defining more realistic ship's draft and using Column Y values.

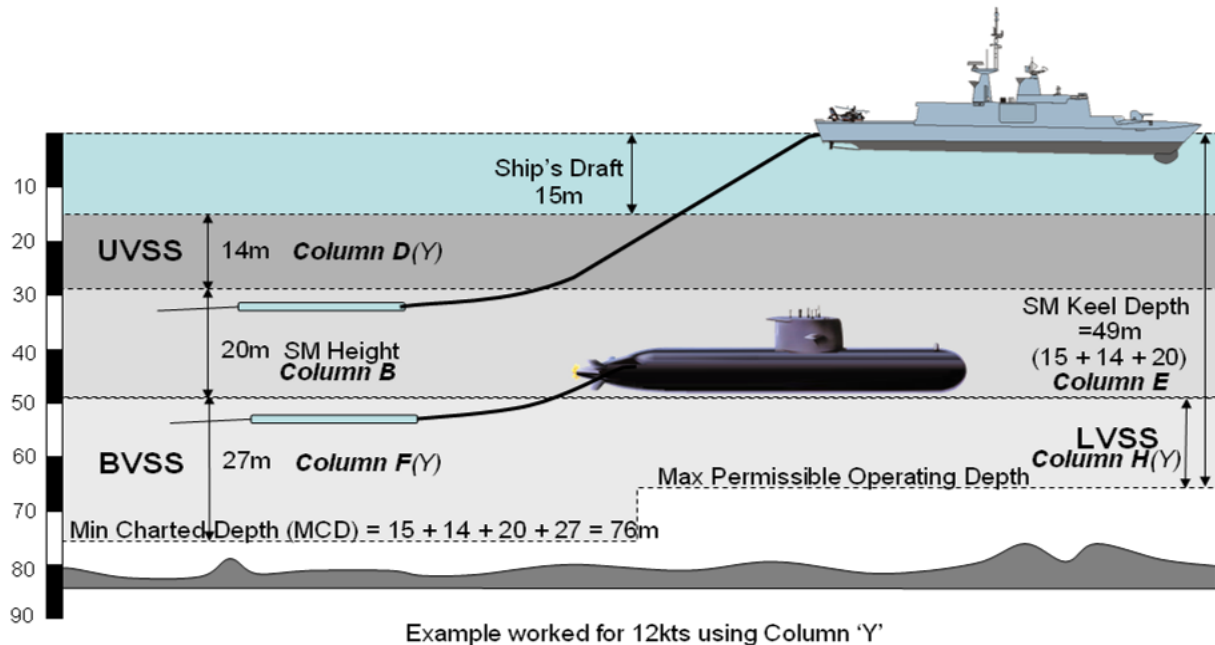


Figure 2-6. Vertical Safety Separation Calculation using Column 'Y' (NU)

| Signal Designator | Type of Decoy       | Long Stay                       |                  | Short Stay                                |                |
|-------------------|---------------------|---------------------------------|------------------|-------------------------------------------|----------------|
|                   |                     | Max Depth of Towed Body and Tow | Length of Tow    | Max Permitted Depth of Towed Body And Tow | Length of Tow  |
| A                 |                     |                                 |                  |                                           |                |
| B                 |                     |                                 |                  |                                           |                |
| C                 | AN/SLQ-25 (NIXIE)   | 54 m (175 ft)                   | 456 m (1,500 ft) | 23 m (75 ft)                              | 183 m (600 ft) |
| D                 | T MK 6 FANFARE      | 31 m (100 ft)                   | 183 m (600 ft)   | -                                         | -              |
| E                 | CAAT                | 18 m (58 ft)                    | 183 m (600 ft)   | 13 m (40 ft)                              | 92 m (300 ft)  |
| F                 | FRENCH AB 1002      | 35 m (114 ft)                   | 229 m (750 ft)   |                                           |                |
| G                 | T MK 6 FANFARE (LC) | 61 m (200 ft)                   | 366 m (1,200 ft) | -                                         | -              |
| H                 | TYPE 2058           | 180 m (590 ft)                  | 560 m (1,841 ft) | -                                         | -              |
| I                 | TYPE 2170           | 61m (200 ft)                    | 456m (1,500 ft)  | 28m (90 ft)                               | 183m (600 ft)  |
| J                 | TBQT-LF             | 200m (656 ft)                   | 400m (1,312 ft)  | 75m (246 ft)                              | 100m (305 ft)  |

Table 2-3. Decoy and Towed Sonar Training Target Depth Restrictions (NU)

#### 2.2.14.9. (NU) Submarine Safe Depth and Minimum Charted Depth of Water Calculation.

The following example calculates submarine safe depth and minimum charted depth of water given the following criteria (calculations based on Table 2-2):

Relaxations in Force

12\*B (15) Ships draft reduced to 15m

12\*C Upper Vertical Safety Separation is reduced to those figures in Column D (Y)

9 D (C) ASW ships may tow NIXIE at Short Stay

Maximum Permitted Towed Decoy Depth: NIXIE 23m (from Table 2-3).

Submarine Speed: 10-12 knots

Ship's Draft is reduced from 30m to 15m (by Relaxation 12\*B). But, this figure is increased, by Table 2-2 Note 8, to 23m which is the depth at which the NIXIE body is towed (see Table 2-3).

Submarine Height from Table 2-2 column B is 20m (not speed dependant).

The UVSS calculation used is 14m as Relaxation 12\*C is in force. Table 2-2 column D is entered in Column Y for a submarine speed of 10 to 12 knots to obtain the figure of 14m.

Therefore, Submarine Safe Depth is calculated as follows:

$$\begin{array}{rclclcl}
 \text{Ship's Draft} & + & \text{UVSS} & + & \text{Submarine Height} & = & \text{Submarine Safe Depth} \\
 23\text{m} & + & 14\text{m} & + & 20\text{m} & = & 57\text{m}
 \end{array}$$

To ascertain the Minimum Charted Depth of water required to conduct an exercise with the above constraints, the following calculation is used:

$$\begin{array}{rclcl}
 \text{Submarine Safe Depth} & + & \text{BVSS} & = & \text{Minimum Charted Depth of water} \\
 57\text{m} & + & 37\text{m} & = & 94\text{m}
 \end{array}$$

(Submarine Safe Depth is obtained from the previous calculation)

BVSS is obtained from Table 2-2 column F(X) where the column is entered for a submarine speed of 10-12 knots. (Note Relaxation 12\*D is not authorised).

Therefore to conduct the CASEX serial in accordance with the example's constraints, a minimum depth of water of 94m is required.

2.2.14.10. (NU) **Safety Separation with Two Submarines.** With two or more submarines taking part in a CASEX, the Safe Depth calculation must be made for a second time applying a further UVSS between the submarines. The SM height of the second submarine is not necessarily the same as the first. Figure 2-7 shows an example of this.

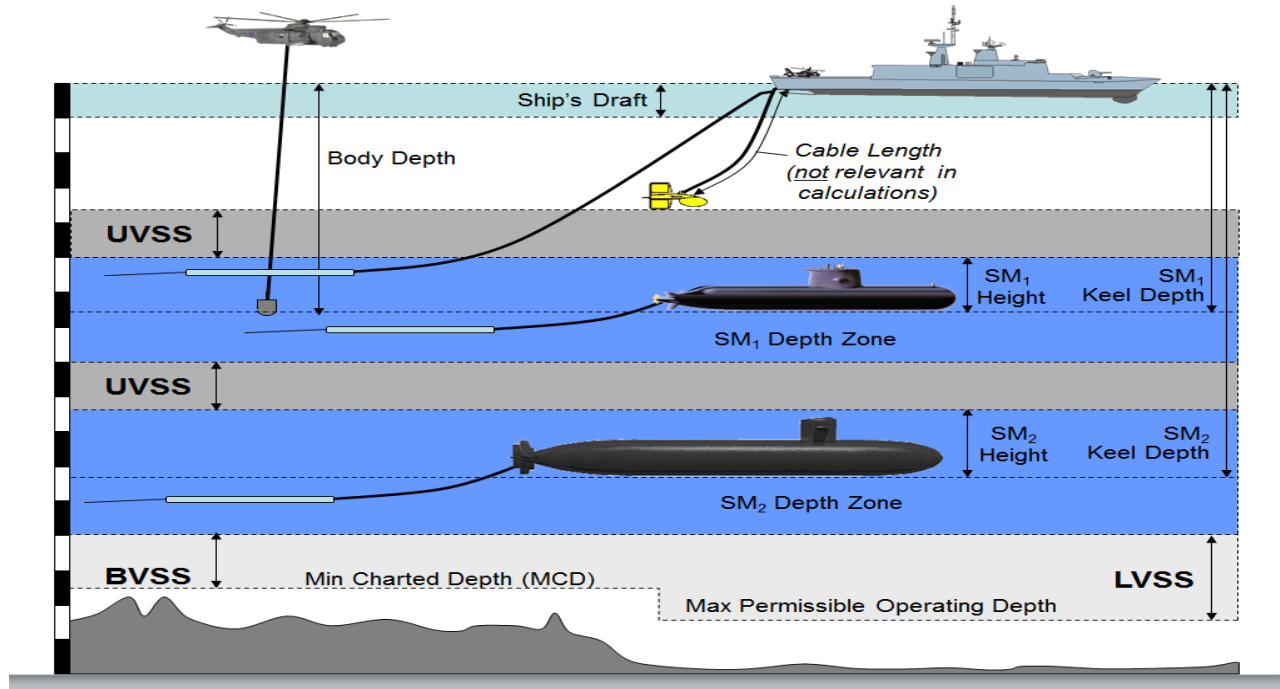


Figure 2-7. Vertical Safety Separation with 2 Submarines (NU)

2.2.14.11. (NU) **Submarine Depth Zones.** It is unreasonable to constrain a submarine to a single depth. Small depth excursions are common. It is therefore appropriate to allocate depth zone to the submarines. UVSS for a deeper submarine or BVSS must be applied to the deepest depth of the allocated submarine depth zone above it.

2.2.14.12. (NU) **Operating at Safe Depth.** During all exercises in which a submarine is participating, ASW units assume that a submarine is at safe depth at all times between COMEX and FINEX (or STOP TIME), except:

- a. When there is positive evidence to the contrary; such as a signal from the submarine that it is not at Safe Depth, failure of the submarine to signal as required when it has reached safe depth, or sighting the periscope or another part of the submarine; and
- b. When the relaxation(s) for the exercise permit the submarine to be at less than Safe Depth. (Relaxations 2\*J, 3\*E, 3\*K, 21A, 21B, 21\*C and/or 21\*D).

2\*J Submarine is not obliged to go to, or to remain at, Safe Depth after COMEX or GO TIME.

3\*E Submarines may proceed from Safe Depth to periscope depth when in company with surface forces prior to receipt of DDD or the 5-charge signal.

- 3\*K Submarines may proceed from Safe Depth to periscope depth when in company with surface forces at the discretion of the submarine Commanding Officer.
- 21A FRNFOR submarines may be at periscope depth at night from (....) to (....). OPFOR submarines must be in their deep depth zone between these times
- 21B OPFOR submarines may be at periscope depth at night from (....) to (....). FRNFOR submarines must be in their deep depth zone between these times.
- 21C FRNFOR submarines may come to periscope depth while in the Safety Zone/Safety Circle to identify HE, provided they return to minimum safe depth within 5 minutes after arrival at periscope depth.
- 21\*D FRNFOR submarines have freedom in depth until HE has been firmly established, where after they are to go to safe depth or to (....) metres (feet).

## 2.2.15 VISIBILITY REQUIREMENTS

(NU) Visibility in which Submarines may Dive. Submarines are not to dive if the visibility through the periscope is less than 3000 yards. This means that surfaced submarines must be visible at a distance of not less than 6000 yards from a ship's bridge. This rule may be relaxed at the discretion of the OSE in concurrence with the SUBOPAETH by using Relaxation 13\*A, 13\*B or 13\*C (Table 3-2) to enable exercises to be carried out. In shallow water, limitations on the maneuverability of the submarine should also be considered. The decision as to whether the visibility is sufficient for the submarine to dive rests entirely with the Commanding Officer of the submarine. The fact that participating surface ships and submarines are equipped with radar in no way relaxes the visibility rules in force. The OSE will consider the efficiency of all participating forces in deciding on any relaxation of safety rules. If a submarine's radar becomes inoperative during darkness or reduced visibility and, as a result, information on which its safety depends cannot be obtained, the submarine's Commanding Officer should break off the exercise and retire from the vicinity until repairs are made. Navigation lights should be switched on during this period. The submarine should keep the OTC or OCS (whichever is appropriate) fully informed of its retirement and of its intention to re-enter the exercise. These instructions may only be relaxed if Relaxation 13\*C is in force. If the visibility from the bridge of a ship participating in the exercise falls unexpectedly below that allowed for the exercise while the submarine is submerged and no Relaxation has been ordered for the exercise, the exercise is to be ended and the submarine surfaced when safe to do so.

## 2.2.16 MINIMUM SUBMARINE ACOUSTIC EQUIPMENT REQUIREMENTS

(NU) Submarines are not to dive unless at least one of their sonar sets is capable of listening for Hydrophone Effect (HE), and of transmitting on SST or communicating by UWT. Submarines taking part in submarine versus submarine exercises must have a passive sonar and underwater communications equipment fully operational. Submarines shall maintain a continuous guard on underwater telephone and a continuous watch on the listening sonar at all times when

submerged. In the event of failure of the underwater telephone or passive sonar, the submarine must surface and assume an out-of-action status until the defect is repaired.

## 2.2.17 SURFACE SHIP NOISE

2.2.17.1. (NU) Types of Surface Ship Noise. Submarines detect surface ships on sonar predominantly using one of the following noise sources:

- a. Sonar transmissions;
- b. Cavitation; or
- c. Radiated noise.

2.2.17.2. (NU) Noise reduction programmes on board many surface ships have now significantly reduced radiated noise. It is important; therefore, particularly within the confines of the simpler CASEX, that the ship provides a reliable acoustic warning of its presence, i.e. sonar and/or cavitation. Ships must be aware; however, of conflict between sonar transmissions and UWT communications and also the speed at which cavitation occurs.

2.2.17.3. (NU) **Surface Ship Radiated Noise Requirements.** Surface ships operating with submerged submarines must cavitate unless Relaxation 7\*A, 7\*B, 7\*C, 7\*D, 7\*E, 7\*G or 7\*F (Table 3-2) is specifically approved by the SUBOPAUTH. These relaxations do not apply when in the vicinity of a submarine that is known to be coming to PD or surfacing (see Articles 2273 and 2274).

2.2.17.4. (NU) **Modern Frigate Low Noise.** To overcome the danger to submarines operating with silent modern frigates, some frigates are fitted with a sequencer which can key UWT's automatically at preset intervals and with different power modes. Use of this equipment during exercise may be authorized by the SUBOPAUTH using Relaxation 7\*H. The specification of the sequencing UWT are detailed in Table 2-6D.

## 2.2.18 LOOKOUTS

2.2.18.1.. (NU) Ships are to ensure that lookouts are trained in the recognition of submarine pyrotechnic signals and profiles. Where the ship's complement allows, at least two dedicated submarine lookouts should be posted. It should be impressed on lookouts that the safety of the submarine may at any time depend on them and that they are responsible for immediately reporting any signals such as smoke, flares and any emergency identification signals (such as red flares, bubbles, oil slicks), or periscope, mast or any other portion of the submarine that is sighted. Lookouts are to be kept aware of the approximate location of the SM and be briefed to report the presence of deep drafted vessels, FV and other hazards to underwater navigation.

2.2.18.2. (NU) Lookouts should be aware of the following signals from submarines. Note that any of these may be requested for demonstration in a CASEX E-1. Characteristics of signals are at Table 5-1. Actions are at Table 5-3.

| Submarine Launched Smoke / Flare / Pyrotechnic |                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Green<br/>(/Black)</b>                      | Marking a simulated short range torpedo attack.<br>This can be taken as positive identification of a PROWLEX submarine and COMEX can be initiated by any participating unit (CASEX C-12).                                                                                                            |
| <b>2x Green</b>                                | Marking a simulated (nuclear) torpedo attack                                                                                                                                                                                                                                                         |
| <b>White /<br/>Yellow</b>                      | Marking position to assist location<br>Also used to acknowledge a Procedure UNIFORM before returning to PD for a FV.<br>Acknowledge an ESUS Code 1<br>Ready to commence the exercise (CASEX A-7)<br>Acknowledge an Aircraft Attack (CASEX B-6)<br>Unbottoming (CASEX E-9)                            |
| <b>2x Yellow<br/>/ White</b>                   | Signals spaced 3 minutes apart indicate surfacing procedure ALFA (see Article 2273).                                                                                                                                                                                                                 |
| <b>Yellow</b>                                  | Marking position (as above) when aircraft are operating using White Smoke.<br>2x Yellow smoke – submarine simulating a guided missile firing.                                                                                                                                                        |
| <b>Red</b>                                     | Carrying out emergency surfacing procedure or in an emergency and unable to surface. [Often repeated]<br>If a red pyrotechnic is released by mistake the submarine must surface as soon as possible to assure other forces that no emergency exists.<br>May be used in CASEX E-1 only when SURFACED. |

Table 2-4. Submarine Launched Smoke/Flare/Pyrotechnic (NU)

**Note:**

*\* Submarines are not to fire grenades (flares), other than red grenades (flares) in an emergency, unless Relaxation 2L is in force.*

## 2.2.19 UNDERWATER TELEPHONE WATCH

2.2.19.1. (NU) Participating units fitted with underwater telephone (UWT) are to maintain a continuous listening watch with optimum receiver gain. Whenever practicable, the UWT should be monitored by competent authority to ensure prompt reaction to emergency signals. ASW ships may enhance UWT clarity by positioning so that neither ship nor submarine is communicating through its baffles/stern arcs. Ships should reduce active sonar transmission (MRS) power during traffic on UWT.

2.2.19.2. (NU) In exercises when Relaxation 7\*F is in force, some submarines are unable to detect echo sounders and, to ensure safety, will transmit safety signals on UWT when returning to periscope depth in accordance with Article 4.32 and Table 4-1. Any ship hearing these signals is to reply without delay and is to transmit a long count every 30 seconds on UWT for 3 minutes to allow the submarine to establish a bearing.

## 2.2.20 COMMUNICATIONS AND SIGNALS

2.2.20.1. (NU) The OCE is to issue instructions in the EXOPORD regarding submarine diving and surfacing signals and check reports. Such instructions will be in accordance with ATP-57 and national requirements. Although check reports from submarines may not be required by

NATO Commanders, the SUBOPAUTH must be prepared to accept and coordinate such reports from participating submarines when required by national authorities. Basic methods of communication between ships, aircraft and submarines used during exercises are listed in Chapter 5.

2.2.20.2. (NU) All surface ships engaged in exercises with a submarine that is at PD and restricted in course and speed, or with one that is about to surface or come to PD, are to be prepared to warn all other shipping to proceed with caution and keep clear by means of International Signal, CODE NE pennant 2.

## **2.2.21 DUMPING OF TRASH, GARBAGE AND WASTE (GASH)**

(NU) Gash should not be ditched during exercises involving submarines. Gash from participating ships may cause confusion in the event of a submarine emergency.

## **2.2.22 - 2.2.29 Spare**

## **2.2.30 SPECIFIC SAFETY PRECAUTIONS**

(NU) Exercise Instructions Affecting Safety. Any instructions in CASEX TABORDs that affect SAFETY are to be promulgated in Para T Exercise Instructions – FRNFOR/OPFOR. Instructions in Para R – FRNFOR or Para S – OPFOR should be of a non-safety related nature only. Special Instructions affecting safety but not covered in Table 3-3 are to be given in Para U.

## **2.2.31 SAFETY PRECAUTIONS WHEN OPERATING WITH AIRCRAFT**

### **2.2.31.1. (NU) Aircraft and Ships**

- a. Because of poor lookout positions in helicopters, ships are responsible for avoiding collision with helicopters in the dip.
- b. Ships firing weapons are to ensure that they do not endanger any aircraft in the vicinity.
- c. To prevent turbulence from affecting the helicopter, surface ships should not pass within 500 yards of a hovering helicopter. Ships should pass downwind of a hovering helicopter.

2.2.31.2. (NU) Helicopters and Fixed Wing Aircraft Operating in Close Proximity. See ATP-01 Volume 1.

### **2.2.31.3. (NU) Aircraft and Submarines**

- a. Submarines are not to fire grenades (flares), other than red grenades (flares) in an emergency, unless Relaxation 2L is in force.
- b. For the precautions to be observed when using helicopter sonar, see Article 2.2.34.

**2.2.32 SAFETY PRECAUTIONS WHEN SURFACE SHIPS APPROACH**

(NU) The SUBOPAETH may specify the range at which the submarine must go to Safe Depth when surface ships, without any towed devices, approach. In this case, this range (which may be as little as 1200 yards when right ahead) must be included in Special Instructions (Order Table, Para U). This safety range will increase progressively with the depth of towed decoys and sonar, unless relaxations permit.

**2.2.33 SAFETY PRECAUTIONS WHEN EMPLOYING TOWED DECOYS**

2.2.33.1. (NU) The following precautions are to be observed when towed decoys are streamed by surface ships in exercises with submarines:

- a. If towed at long stay, the type of decoy must have the approval of the SUBOPAETH. When their employment is authorized, they may be towed either silent or emitting.
- b. The fact that decoys are to be streamed is to be included in the CASEX order, together with the type of decoy and the length of stay. (See Table 2-3.) Relaxations 9B, 9\*C, 9D and 9\*E (Table 3-2) apply to the use of decoys.
- c. When decoys are streamed at long stay, the submarine (if not already at a Safe Depth) is to proceed to a Safe Depth when the nearest ship approaches within 2000 yards. This range may be reduced at the discretion of the SUBOPAETH using Relaxation 9\*A.
- d. Ship's speed is not to be reduced if this involves the decoy or tow dropping below the appropriate maximum depth figures in Table 2-3.
- e. Before starting the procedures to bring the submarine up to PD, decoys are to be switched off and raised in accordance with Articles 2.2.73 and 2.2.74.

**2.2.34 SAFETY PRECAUTIONS WHEN EMPLOYING HELICOPTER SONAR**

2.2.34.1. (NU) To minimize the risk of collision between submarines and helicopter sonar, the following precautions are to be observed:

- a. The submarine is to proceed at Safe Depth (Article 2.2.14), based on the maximum depth at which the sonar will be employed, unless Relaxation 8C is in force.
- b. When it is desired to operate the helicopter sonar transducer at the best search depth, and this determines a Safe Depth that the submarine is unable to reach, Relaxation 8F should be ordered. The submarine Safe Depth is then based on the initial search depth promulgated with Relaxation 8F.
- c. In advanced exercises where the use of evasive tactics are desirable, the submarine is not required to proceed to Safe Depth provided Relaxation 8C is in force. However, submarines are not to deliberately close within 500 yards of a dipping helicopter and helicopters are not to deliberately enter or remain in

the dip if within 500 yards of the submarine.

**2.2.35 ADDITIONAL RESTRICTIONS TO ESTABLISH A VERTICAL SAFETY SEPARATION WHEN TOWED VDS/DTAS/MTAS IS USED**

2.2.35.1. (NU) These additional restrictions apply when submarines and ASW units using VDS/DTAS/MTAS operate in the same zone.

**a. General**

- (1) The OCE shall ensure that all participating units acknowledge receipt of OPORD/ Exercise Orders and any changes thereto prior to Start Time in exercises involving VDS/DTAS operations.
- (2) In ASW exercises involving the use of VDS/DTAS, the submarine Commanding Officer must assume that all escorts are streaming VDS/DTAS unless positively known otherwise, and that VDS/DTAS ships do not know the submarine position.
- (3) When authorization B is applicable (Table 2-5), ships with VDS/DTAS streamed must comply with the following rules:
  - a) Operate at least one sonar in the active mode continuously.
  - b) If no sonar systems are able to transmit, the VDS/DTAS must be recovered as soon as possible.
  - c) If the VDS/DTAS cannot be recovered and no sonar systems are able to transmit, the warning signal -"VDS"- shall be transmitted on UWT every 2 minutes.
  - d) The above paras (a), (b) and (c) do not apply when Relaxation 8\*H and/or 8\*N are/is in force. The above restrictions are; however, applicable when in the vicinity of a submarine that is known to be coming to PD (see Articles 2.2.73 and 2.2.74).
  - e) In addition to the above, when a VDS/DTAS is, for whatever reasons, being towed outside its allocated depth limits, the warning signal -"VDM"- followed by depth in metres (e.g. VICTOR DELTA MIKE - NINE ZERO) shall be transmitted at intervals of not more than two minutes on UWT.
  - f) In addition to the above, ships towing VDS/DTAS by night are to show their navigation lights at full brilliance.
- (4) Ships may be authorized to lower VDS/DTAS/MTAS to depths greater than the depth of the submarine, providing the SUBOPAETH and national authorities have agreed to the Relaxation 8\*M. The exercise schedule type of submarine assigned, and the practice or exercise weapons to be employed may impose additional restrictions on the operating depth of the

submarine. In specifying the VDS/DTAS/MTAS depth limits, the OCE/OSE must ensure that an adequate vertical safety separation is specified. Safety signals for both VDS/DTAS and submarine shall be specified by SUBOPAUTH/OCE.

b. **Restrictions.** When authorization B is applicable (Table 2-5), the following rules apply when employing VDS/DTAS:

- (1) The minimum depth separation between submarine and ship or VDS/DTAS is to be in accordance with Table 2-2 and associated important notes.
- (2) When VDS/DTAS is being employed, the submarine is to go to a safe depth when the nearest ship approaches within:
  - a) 4000 yards, if the permitted cable length does not exceed 77 meters (250 feet);
  - b) 6000 yards, if the permitted cable length exceeds 77 meters (250 feet), but does not exceed 122 meters (400 feet); and
  - c) 8000 yards, if the permitted cable length exceeds 122 meters (400 feet).

If the submarine has positively identified the surface ship as not employing VDS/DTAS, the safe depth applicable to the surface ship draft may be assumed. These rules may be relaxed at the discretion of the SUBOPAUTH using Relaxation 8\*A.

(3) Normally, 1500 yards is to be considered the minimum distance for use with Relaxation 8\*A.

(4) Use of 8\*H needs to transmit the warning signal "Victor Delta Sierra" successively on the VDS and hull sonar UWT, or hull sonar UWT only if no practicable, every two minutes.

|          |                                                                                         |
|----------|-----------------------------------------------------------------------------------------|
| <b>A</b> | May be used without restriction;                                                        |
| <b>B</b> | May be used with rules and relevant relaxations specified in this article and Table 3-2 |
| <b>C</b> | May not be used.                                                                        |

| TYPE OF TOWED DEVICE                                                          | EQUIPMENT DESIGNATOR  | NATIONALITY OF EXERCISE SUBMARINE |     |     |     |     |     |     |     |     |     |     |     |     |
|-------------------------------------------------------------------------------|-----------------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                                                               |                       | CAN                               | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |
| <b>CATAS</b><br><b>Critical-Angle</b><br><b>Towed Array</b><br><b>Systems</b> | ANACONDA              | A                                 | A   | B   | B   | B   | A   | B   | B   | B   | B   | B   | A   | A   |
|                                                                               | SONAR 2031            | A                                 | A   | B   | B   | B   | A   | B   | B   | B   | B   | B   | A   | A   |
|                                                                               | DSBV 61 (CATAS)       | A                                 | A   | B   | B   | B   | A   | B   | B   | B   | B   | B   | A   | A   |
|                                                                               | AN/SQR-501            | A                                 | A   | B   | B   | B   | A   | B   | B   | B   | B   | B   | A   | A   |
|                                                                               | AN/SQR-18A (V) 2      | A                                 | A   | B   | B   | B   | A   | B   | B   | B   | B   | B   | A   | A   |
|                                                                               | AN/SQR-19             | A                                 | A   | B   | B   | B   | A   |     | B   | B   | B   | B   |     | A   |
|                                                                               | SONAR 2170            | A                                 | A   | B   | B   | B   | A   |     | C   | B   | B   | B   |     |     |
|                                                                               | SLAT                  | A                                 | A   | B   | B   | B   | A   |     | C   | B   | B   | B   |     |     |
|                                                                               | SONAR 4249 TA (CATAS) |                                   | A   | B   | B   |     | A   |     |     |     | B   |     |     |     |
|                                                                               | ISS TA                |                                   |     | B   | B   | B   | B   |     |     |     | B   |     |     |     |
|                                                                               | ISS - TB (VDS)        |                                   |     | B   | B   | B   | B   |     |     |     | B   |     |     |     |
|                                                                               | ISS - TA (CATAS)      |                                   |     | B   | B   | B   | B   |     |     |     | B   |     |     |     |
| <b>CATAS-S</b>                                                                | AN/UQQ2 (Production)  | A                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                                                               | AN/UQQ2 (Twin Line)   | A                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
| <b>DTAS</b><br><b>Depressed Towed</b><br><b>Array Systems</b>                 | AN/SQR-18A (US)       | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                                                               | DSBV 61 (DTAS)        | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                                                               | AN/SQR-18A (V) 1      | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |

Table 2-5. General Authorization VDS/TAS/MTAS (see Article 2235.2) (NU)

| TYPE OF TOWED DEVICE                         | EQUIPMENT DESIGNATOR  | NATIONALITY OF EXERCISE SUBMARINE |     |     |     |     |     |     |     |     |     |     |     |     |
|----------------------------------------------|-----------------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                              |                       | CAN                               | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |
| <b>STAS</b><br>Submarine Towed Array Systems | BQR/15                | A                                 | A   | B   | B   | A   | A   | B   | B   | A   | B   | B   | A   | A   |
|                                              | DSUV62C               | A                                 | A   | B   | B   | A   | A   |     | B   | A   | B   | B   | B   | A   |
|                                              | SONAR 2026            | A                                 | A   | B   | B   | A   | A   | B   | B   | A   | B   | B   | B   | A   |
|                                              | SONAR 2046            | A                                 | A   | B   | B   | A   | A   | B   | B   | A   | B   | B   | B   | A   |
|                                              | SUBTASS               | A                                 | A   | B   | B   | A   | A   |     | B   |     | B   | B   |     | A   |
|                                              | SOLARSUB-B            |                                   |     | B   | A   |     | A   |     |     |     | B   |     |     |     |
| <b>VDS</b><br>Variable Depth Sonar Systems   | AN/SQA-10A            | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | AN/SQA-13             | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | AN/SQS-35             | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | AN/SQS-504            | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | AN/SQS-505            | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | AN/SQS-510            | B                                 | B   | B   | B   |     | B   |     | B   | B   | B   | B   | B   | B   |
|                                              | DUBV 43 A/B           | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | SONAR 199             | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | DE 1160               | B                                 | B   | B   | B   | B   | B   |     | B   |     | B   | B   |     | B   |
|                                              | DE 1164               | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | DUBV 43C              | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
|                                              | SALMON TSM 2643A      | B                                 | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   | B   |
| <b>MTAS</b>                                  | SONAR 2087 - VDS      |                                   | B   | B   | B   |     | B   | B   | C   |     | B   |     | B   |     |
|                                              | SONAR 2087 - CATAS    |                                   | B   | B   | B   |     | A   | B   | C   |     | B   |     | A   |     |
|                                              | SONAR 4249 TB (VDS)   |                                   | B   | B   | B   |     | B   |     |     |     | B   |     |     |     |
|                                              | SONAR 4249 TA (CATAS) |                                   | A   | B   | B   |     | A   |     |     |     | B   |     |     |     |
|                                              | LFAPS TB (VDS)        |                                   |     |     |     |     | B   |     |     |     | B   |     |     |     |
|                                              | LFAPS TA (CATAS)      |                                   |     |     |     |     | A   |     |     |     | B   |     |     |     |

Table 2-5. General Authorization VDS/TAS/MTAS (Cont'd) (NU)

| SIGNAL DESIGNATOR                           | A       | C              | D | E       | F       | G        | H        | I                |
|---------------------------------------------|---------|----------------|---|---------|---------|----------|----------|------------------|
| EQUIPMENT DESIGNATOR                        | DE-1160 | AN/SQS-35      |   | DUBV43B | DE 1164 | DUBV 43C | Socrates | LFAPS Towed Body |
| USER NATIONS                                | GRC     | USA/TUR        |   | FRA     | ITA     | FRA      | NLD      | NLD              |
| UWT IN BODY                                 | NO      | YES            |   | YES     | NO      | YES      | NO       | NO               |
| WEIGHT OF TOWED BODY (kg)                   |         |                |   |         |         |          |          |                  |
| WEIGHT OF CABLE (max)(kg)                   |         |                |   |         |         |          |          |                  |
| MAX LENGTH OF CABLE (m(ft))                 |         |                |   |         |         |          |          |                  |
| DIAMETER OF VDS CABLE(mm)                   |         |                |   |         |         |          |          |                  |
| BREAKING STRENGTH (kg)                      |         | NOT RELEASABLE |   |         |         |          |          |                  |
| MAX PAYOUT/MAX INHAUL SPEED (m/min(ft/min)) |         |                |   |         |         |          |          |                  |
| MAX OPERATIONAL TOW DEPTH (m(ft))           |         |                |   |         |         |          |          |                  |
| MIN TIME TO RECOVER FROM MAX PAYOUT (min)   |         |                |   |         |         |          |          |                  |
| ASSOCIATED ARRAY (if applicable)            |         |                |   |         |         |          |          |                  |
| FREQUENCY (kHz)                             |         |                |   |         |         |          |          |                  |
| MIN LENGTH OF TOW CABLE (m(ft))             |         |                |   |         |         |          |          |                  |

Table 2-6A. VDS Specifications (NU)

**Note:** Non-metric values are accurate. Metric values are rounded off to the nearest metre.

[illegible]

Table 2-6B. Towed Array Specifications (NU)

**Note.**

*Non-metric values are accurate. Metric values are rounded off to the nearest metre.*

| SIGNAL DESIGNATOR    | W                                       | X                   | Y              | Z    | AA         | AB      | AC       | AD        | AE         | AF |
|----------------------|-----------------------------------------|---------------------|----------------|------|------------|---------|----------|-----------|------------|----|
| TYPE OF ARRAY        | CATAS-S                                 | CATAS-S EQUIPMENT   | DTAS           | DTAS | CATAS      | CATAS   | CATAS    | CATAS     | STAS       |    |
| EQUIPMENT DESIGNATOR | AN/UQQ2 (Production) (see NOTE 2 below) | AN/UQQ2 (Twin Line) | CAPTAS MK2     | MK2  | SONAR 2170 | SLAT    | LFAPS TA | SONAR ISS | SOLARSUB-B |    |
| USER NATION          | USA                                     | USA                 | NOR            | NOR  | GBR        | ITA/FRA | NLD      | ITA       | ESP        |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
| UWT INCORPORATED     | NA                                      | NA                  | NO             |      | NO         | NO      | NO       | NA        | NO         |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     | NOT RELEASABLE |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |
|                      |                                         |                     |                |      |            |         |          |           |            |    |

Table 2-6B. Towed Array Specifications (Cont'd) (NU)

**Notes.**

- 1: Non-metric values are accurate. Metric values are rounded off to the nearest metre.
- 2: Data fuses parameters for several similar array systems, using the most conservative values in terms of Submarine safety where differences exist.

| SIGNAL DESIGNATOR                                  | BA  | BB  | BC             | BD       | BE        | BF      | BG      |
|----------------------------------------------------|-----|-----|----------------|----------|-----------|---------|---------|
| EQUIPMENT DESIGNATOR                               |     |     | LFAPS TB       | LFAPS TA | ISS TA-TB | 4249 TB | 4249 TA |
| USER NATION                                        | GBR | GBR | NLD            | NLD      | ITA       | FRA     | FRA     |
| TYPE OF ARRAY                                      |     |     |                |          |           |         |         |
| UWT INCORPORATED                                   |     |     |                |          |           |         |         |
| FREQUENCY(KHZ)                                     |     |     |                |          |           |         |         |
| TYPE OF DEPRESSOR                                  |     |     |                |          |           |         |         |
| DEPRESSOR WEIGHT (kg)                              |     |     |                |          |           |         |         |
| CABLE WEIGHT (kg)                                  |     |     |                |          |           |         |         |
| TOWED BODY WEIGHT (kg)                             |     |     |                |          |           |         |         |
| CABLE LENGTH (max) (m(ft))                         |     |     | NOT RELEASABLE |          |           |         |         |
| ARRAY LENGTH (m(ft) (including connector)          |     |     |                |          |           |         |         |
| DIAMETER OF TOW CABLE                              |     |     |                |          |           |         |         |
| BREAKING CONNECTOR STRAIN (kg)                     |     |     |                |          |           |         |         |
| CABLE – ARRAY MAXIMUM PAYOUT/ INHAUL SPEED (M/MIN) |     |     |                |          |           |         |         |
| MAXIMUM OPERATIONAL TOW DEPTH (m(ft))              |     |     |                |          |           |         |         |
| MINIMUM TIME TO RECOVER FROM MAXIMUM PAYOUT (min)  |     |     |                |          |           |         |         |

Table 2-6C. Multiple Towed Array System Specifications (NU)

**Notes:**

1. S2087 Towed Body (BA) Minimum BVSS is 20m.
2. S2087 Towed Array (BB) minimum BVSS is 30m.
3. Consideration of environmental influences, bottom topography and the operational situation may dictate the adoption of increased BVSS.

| SIGNAL DESIGNATOR | A              | B            | C        | D        | E       | F      | G | H |
|-------------------|----------------|--------------|----------|----------|---------|--------|---|---|
| UWT DESIGNATOR    | UT 2000        | 2009         | TUUM 4   | TUUM 6   | UT 2000 | UT3000 |   |   |
| USER NATION       | NLD, NOR, PRT  | UK, GBR, NOR | ITA, FRA | ITA, FRA | ITA DEU | DEU    |   |   |
|                   |                |              |          |          |         |        |   |   |
|                   |                |              |          |          |         |        |   |   |
|                   |                |              |          |          |         |        |   |   |
|                   | NOT RELEASABLE |              |          |          |         |        |   |   |
|                   |                |              |          |          |         |        |   |   |
|                   |                |              |          |          |         |        |   |   |
|                   |                |              |          |          |         |        |   |   |
|                   |                |              |          |          |         |        |   |   |

Table 2-6D. Automatic Sequencing UWT Specifications (NU)

**2.2.36 ADDITIONAL RESTRICTIONS TO ESTABLISH A HORIZONTAL SAFETY SEPARATION "NEUTRAL CORRIDOR" WHEN TOWED VDS/DTAS/MTAS IS USED**

2.2.36.1.(NU) These additional restrictions shall apply when submarines and ASW units using VDS/DTAS/MTAS operate in two adjacent areas separated by means of a neutral corridor.

**2.2.36.2. (NU) General.**

- a. Safety is achieved by the establishment of a "Safety Corridor" between the operating areas of participating units. Therefore, accurate navigation by all participants is of paramount importance; navigational accuracy relative to the neutral corridor should be better than 1000 yards.
  - (1) The basic safety requirements for VDS are:
    - a) That the exercise be limited to two hours (or as authorized by the SUBOPAUTH);
    - b) That the submarine and the VDS ship be in visual contact at the start of the exercise; and
    - c) That the width of the neutral corridor is 4000 yards.
  - (2) Until specific CASEXes are promulgated for exercises between ships with DTAS and submarines, OCEs may order individual exercises using a horizontal separation "Neutral Corridor". The duration of the exercise, the minimum width of the corridor and the relaxations to be used in such an exercise must have the prior approval of the SUBOPAUTH and national authorities.
- b. Since the width of the neutral corridor and time limitation may reduce the benefits of VDS/DTAS/MTAS training, OSE/OCEs are provided with relaxations to modify this procedure and adapt it to individual training requirements under the prevailing conditions.
- c. When participants consider that their navigation equipment is not accurate enough to be able to comply with the safety rules in this paragraph, they should report to the OCE forthwith, who will increase the width of the neutral corridor accordingly.
- d. When authorization B is applicable (Table 2-5), ships with VDS/DTAS/MTAS streamed must operate at least one sonar in the active mode continuously, unless Relaxation 8\*H is in force. The above restrictions are; however, applicable when in the vicinity of a submarine that is known to be coming to PD (see Articles 2.2.73 and 2.2.74).

**2.2.36.3. Modifications of Restrictions by Special Relaxations**

- a. **Relaxation 14\*A**

- (1) This relaxation is not to be used in zones in which there are strong or variable currents/tidal streams, or when visibility is less than 4000 yards.
- (2) The number of runs to be carried out and if required, the duration of the runs is to be specified, bearing in mind the difficulties of relocking after nightfall.
- (3) After each run the submarine comes to PD or surfaces if necessary using the procedure outlined in Article 2.2.73 (or Article 2.2.74 if Relaxation 3\*J in force), and establishes radio contact with the OCS. The OCS re-fixes the lock point for the neutral corridor.
- (4) If Relaxation 14\*D is also in effect, each of the participants fixes its position and resets the plotting table from a geographic al fix.

**b. Relaxation 14\*B**

- (1) This relaxation is not to be used in zones in which there are strong or variable currents/tidal streams.
- (2) At GO TIME plus 2 hours (or as specified), the neutral corridor is extended to 8000 yards. The extension is made into the VDS/DTAS area; the original reference point of the neutral corridor remaining unchanged.

**c. Relaxation 14\*C (Figure 2-8)**

- (1) This relaxation is to be used only if the exercise zone is large enough to allow the submarine an area of at least five nautical miles both in length and width.
- (2) The two parts of the neutral corridor are established at GO TIME according to standard procedure. The submarine position at that time is the lock point common to the two parts of the neutral corridor. It is only necessary for the OCS to signal the submarine quadrant to define the two parts of the neutral corridor. One is parallel to the Safety Course and the other is at right angles to it, both parts extending from the lock point into the zone reserved for the escort vessels.
- (3) The Safety Course must be selected so that when coming to PD, the submarine does not risk penetrating one of the two parts of the neutral corridor; the VDS/DTAS/MTAS equipped escort vessels are to steer the reciprocal of the Safety Course, if necessary, to remain outside the neutral corridor (see Articles 2.2.73 and 2.2.74).

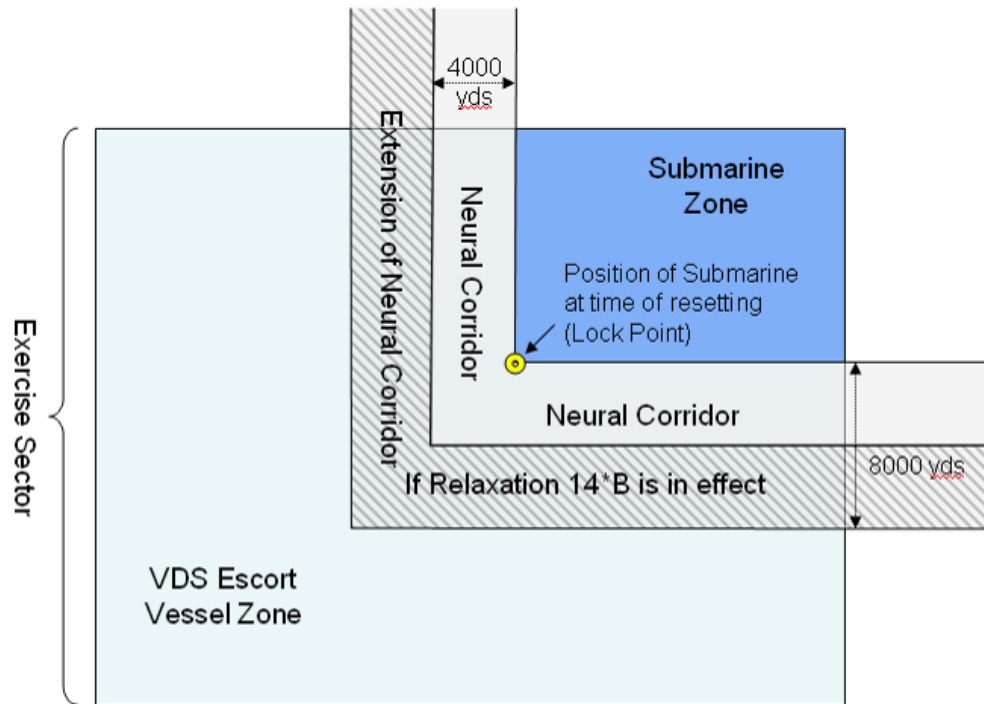


Figure 2-8. Relaxation 14\*B and 14\*C (NU)

d. **Relaxation 14\*D** (Figure 2-9)

- (1) At GO TIME, all participants are to establish their position by visual fix or by a combination of radar/visual fix and not only by radio-electrical means.
- (2) The geographically-established neutral corridor is defined by a bearing line from a visible landmark. The neutral corridor extends laterally from the bearing line into the VDS/DTAS vessels zone. The bearing line; therefore, becomes the limited bearing line between the neutral corridor and the submarine zone. This is to be specified in paragraph U of the CASEX order as follows: "Submarine zone to the ... (e.g. northwest of the line bearing ... from ... (e.g. lighthouse))."
- (3) The bearing of the neutral corridor is not necessarily on a cardinal heading: The safety course may not be parallel to the neutral corridor and it must be selected in such a way that the submarine does not risk penetrating the neutral corridor when coming to PD.
- (4) Units are to plot the sub-marine sector and the neutral corridor on a suitable chart and plotting table. The exercise should not start until the submarine reports "ready".
- (5) Units will remain in their respective zones navigating by dead reckoning, and the neutral corridor is not re-established. If a significant difference is

observed between the geographical position and the dead reckoning position (strong current, for example) the OCS must discontinue the exercise.

- (6) This relaxation removes the requirement for the participants to be in visual contact at the start of the exercise.

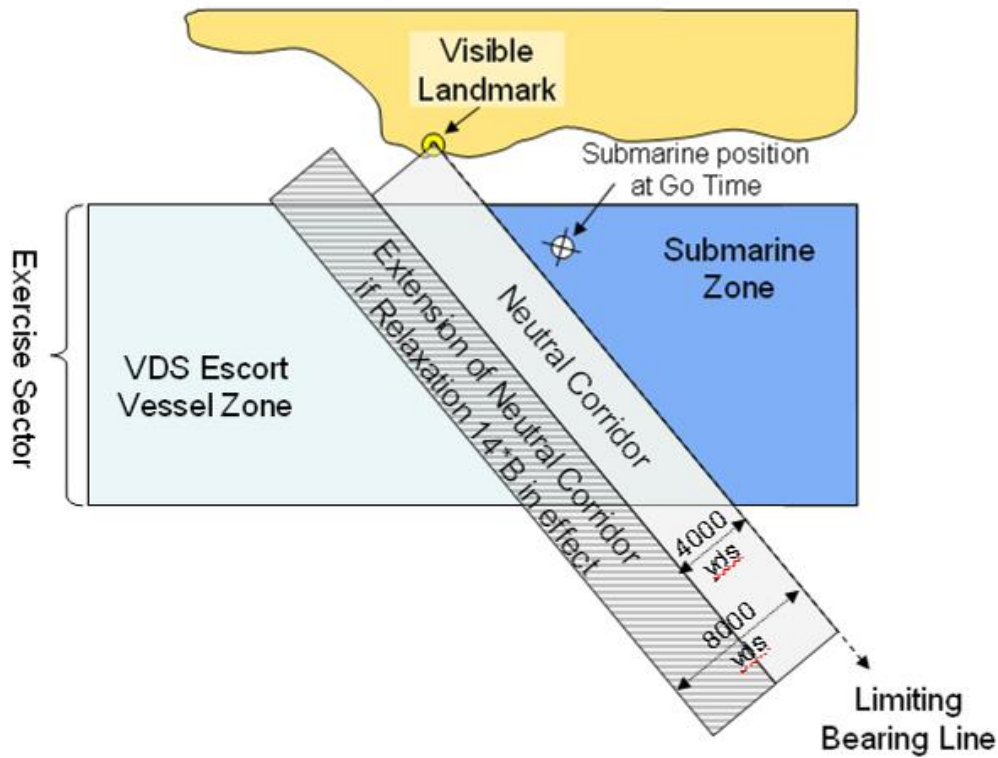


Figure 2- 9. Relaxation 14\*D (NU)

e. **Relaxation 14\*E**

- (1) This relaxation is to be ordered only if the visibility is greater than 4000 yards in the exercise area and the overall navigation system accuracy for each unit is better than 1000 yards per hour.
- (2) This relaxation can be used with Relaxations 14\*C and 14\*D, but should never be ordered at the same time as Relaxation 14\*B.
- (3) If it is desirable to extend the duration of the exercise beyond two hours, Relaxation 14\*A should be ordered and the neutral corridor must be re-established after each run.

## 2.2.37 ADDITIONAL RESTRICTIONS WHEN CATAS IS USED

2.2.37.1. (NU) These additional restrictions shall apply when submarine and ASW units using CATAS operate in the same zone.

### a. **General**

- (1) The OCE shall ensure that all participating units acknowledge receipt of OPORD/ Exercise Orders and any changes thereto prior to GO TIME in exercises involving CATAS operations.
- (2) In ASW exercises involving the use of CATAS, the submarine Commanding Officer must assume that all escorts are streaming CATAS unless positively known otherwise, and that CATAS ships do not know the submarine's position.
- (3) When authorization B is applicable (Table 2-5), ships with CATAS streamed must comply with the following rules:
  - a) Operate at least one sonar in the active mode continuously.
  - b) If no sonar systems are able to transmit, the CATAS must be recovered as soon as possible.
  - c) If the CATAS cannot be recovered and no sonar systems are able to transmit, the warning signal "-TAS"- shall be announced on UWT every 5 minutes.
  - d) The above paras (a), (b) and (c) do not apply when Relaxation 8\*J or 8\*K is in force. The above paras are; however, applicable when in the vicinity of a submarine that is known to be coming to PD (see Articles 2.2.73 and 2.2.74).

### b. **Use of Horizontal Safety Separation "Neutral Corridor" When Authorization B is Applicable**

- (1) Until specific CASEXes are promulgated for exercises between ships with CATAS and submarines, OCEs may order individual exercises using a horizontal separation "Neutral Corridor". The duration of the exercise, the minimum width of the corridor and relaxations to be used in such an exercise must have the prior approval of the SUBOPAETH and national authorities.

2.2.37.2. (NU) **Close Quarters.** In CASEXs deliberately promoting close quarters situations between ships and submarines (eg. CARTWHEELS) a UVSS may be applied between the maximum depth of the CATAS and the top of the submarine when operating within a "Close Quarters" area, nominally 4000 yards around the towing ship. This will be permitted by the SUBOPAETH using Relaxation 8\*Q. This is depicted in Figure 2-12. In other CASEX serials, although there is a risk of collision between a submarine and a "soft" towed array system, it is a smaller risk and regarded as a cost of operating. Relaxations 8\*K (transmitting "Tango Alpha

Sierra" on UWT), or 8\*P (transmitting echo sounder) may be used in mitigation if this risk is considered unacceptable. The submarine may safely operate at PD inside this 4000 yds area when she has the surface ship in sight (eg. a CASEX E-1).

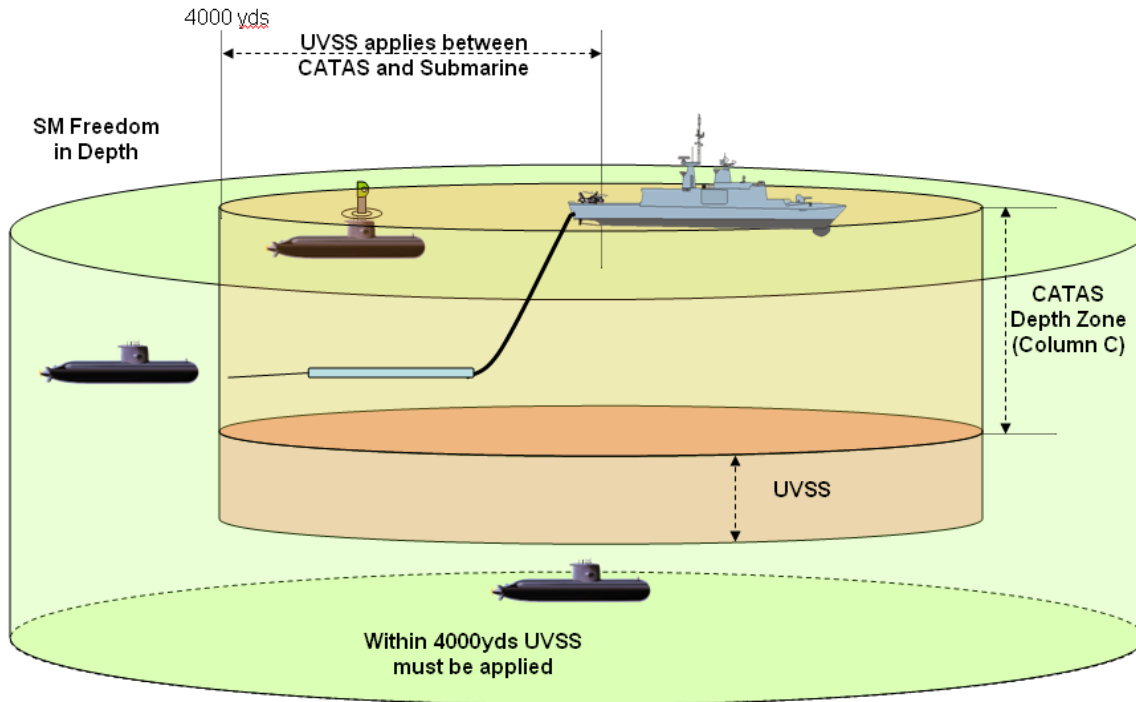


Figure 2-10. Close Quarters CASEXs (NU)

## 2.2.38 EXERCISE STOVEPIPE AND SKYLIGHT

2.2.38.1. (NU) An Exercise Stovepipe or Skylight is designed to provide an exercise submarine with an enhanced level of safety when depth zone restrictions are in force. For example, different depth zones may be in force as a result of two or more submarines operating in the same geographical area; or when a submarine is operating with surface forces operating VDS/DTAS/MTAS (and in some cases CATAS) or helicopters employing dipping sonar. An Exercise Stovepipe or Skylight will allow a submarine to return to PD (or surface) for safety or to copy signal message traffic, etc.

2.2.38.2. (NU) An Exercise Stovepipe is a static geographic cylindrical volume of water which is declared from the surface to a specific depth (or the sea bottom if it is not specified) to allow a deep submarine to return to Periscope Depth through a depth zone nominally allocated to another submarine. It is normally centred on a geographic position and has a default radius of 5nm from that position. This volume of water may be modified in the CASEX Standard Orders (para PP) or Exercise Orders as appropriate.

2.2.38.3. (NU) An exercise Skylight is a special case of an Exercise Stovepipe and has the same function, but is quadrilateral in shape (eg. Rectangle, parallelogram or diamond). Skylights are therefore easily used in conjunction with grid systems (such as CGRS and 4W) in which rectangular areas are established. Designated area within such a grid system (may be allocated

as Skylights). Skylights may also be used outside a grid system, but then have to be explicitly defined by coordinates (eg. Latitude and Longitude).

2.2.38.4. (NU) An Exercise Stovepipe (or Skylight) is for the use of a designated submarine only; other submarines, participating surface ships and helicopters in the dip are to remain clear (unless 15 Series Relaxations are in force). The use of sonobuoys within an Exercise Stovepipe (or Skylight) is not restricted (unless exercise instructions dictate otherwise).

**Note:**

*All further references to Exercise Stovepipes in this publication should be taken to include Exercise Skylights.*

## **WARNING**

The purpose of an Exercise Stovepipe or Skylight is to ensure submarine safety. An Exercise Stovepipe should not be confused with a Stovepipe or Skylight designated in an Operational Message or Op Order. ATP-1 details the use of Stovepipes for operational use. The significant difference is that an operational Stovepipe or Skylight does not place the same restrictions on Waterspace Management and PMI on surface ships and helicopters. Submarine crews must be aware of this fact.

1. (NU) Starred relaxations to allow participating surface forces and ASW helicopters the ability to operate within or adjacent to an Exercise Stovepipe or Skylight are designated in Table 3-2 (Series 15 Relaxations).

2. (NU) All ordered relaxations for the exercise apply in an Exercise Stovepipe or Skylight, however due to the express nature of an Exercise Stovepipe in providing for submarine safety in exercises, the Relaxation 15 Series take precedence over other relaxations in force.

## **2.2.39 THE USE OF EXPLOSIVE CHARGES**

2.2.39.1. (NU) Two important factors influence the use of explosive charges: the type of charge, and the range/depth from the submarine.

- a. Table 2-7 is the authority governing the use of explosive charges. Unless the National SUBOPAUTH, when assigning a submarine for an exercise, specifically prohibits the use of explosive charges, the employment of these indicated in Table 2-7 is permitted subject to the instructions listed below:

### **(1) Types of Charges**

- a) Subject to the restrictions given in column 7, only the charges listed in Table 2-7 may be used against submarines of nations listed in column 5 as follows:

X - May be used against SSN or diesel-electric submarines.

Y - May be used against diesel electric-submarines.

Z - Not to be used without specific SUBOPAUTH approval.

N - Not to be used against any submarine.

**Note.**

*A blank indicates lack of response from the nation concerned.*

- b) The exercise and trial orders are to specify all the types of explosive charges that are authorized for use (X, Y and Z) (Table 3-1, para V4).
- c) Charges that cannot be positively identified are not to be used.
- d) The use of charges other than those listed in Table 2-7 is forbidden unless specifically authorized by the SUBOPAUTH.

**(2) Range/Depth**

- a) All X- and Y- Rated charges may be dropped without further authorization provided they are aimed to fall outside 1000 yards from the estimated position of the submarine.
- b) All X- and Y- Rated charges may be dropped without a range restriction only if Relaxation 10\*A is in force.
- c) No Z - Rated charges are to be used unless specified in Relaxation 10\*B. In this case, those designate Z - Rated charges may be dropped OUTSIDE the range from the submarine specified in the relaxation.
- d) Under no circumstances is a charge to be aimed to hit a submarine or aimed at the estimated position of a submarine.
- e) No charge is to be dropped on a submarine in the act of diving or surfacing.
- f) Charges are only to be used where there is sufficient depth of water to ensure that they detonate.

b. The following procedures are to be applied:

- (1) The OSE/OCE/OTC is responsible for obtaining approval for Relaxation 10\*A and Relaxation 10\*B from the SUBOPAUTH who, in turn, is responsible for obtaining appropriate national clearance for submarines of other nations operating under its OPCON.
- (2) Where national clearances result in variations in range criteria for use with Z-rated charges, the SUBOPAUTH is to use a single range which reflects the most restrictive condition, when approving Relaxation 10\*B.

- c. When nations intend to introduce new charges for inclusion in Table 2-7, full details of the charge should be provided, including the following:
- (1) General arrangement drawing with dimensions;
  - (2) Full particulars of any explosive charge;
  - (3) Detonation depth or depths;
  - (4) Detonation depth range, also measures taken to ensure accuracy of the detonation depth;
  - (5) Weight of complete charge;
  - (6) Reference or full name which clearly identifies the charge; and
  - (7) Means of identification.

These details will be required by SUBOPAUTHs should a request be made to use in an exercise a charge not already authorized in Table 2-7.

- d. Nations are to inform the Custodian of any changes to explosive charges which may be used against their own submarines, and the Custodian will issue a message correction to keep Table 2-7 current.

#### **2.2.40 ELECTRONIC SOUND UNDER-WATER SIGNALS (ESUS)**

2.2.40.1. (NU) Electronic sound underwater signals (ESUS) are non-explosive electronic devices which are used for signaling submerged submarines. ESUS transmits a coded acoustic signal for use in both exercise and non-exercise operations.

2.2.40.2. (NU) For exercises, the meanings of the various codes are detailed in Table 5-5. The following general instructions apply:

- a. ESUS can be used any time against any submarine without prior approval of the SUBOPAUTH.
- b. ESUS that cannot be positively identified are not to be used.
- c. ESUS are not to be aimed to hit a submarine.

#### **2.2.41 – 2.2.49 Spare**

## ABBREVIATIONS

ASTI: Anti-Submarine Target Indicator  
PDC: Practice Depth Charge

RC: Reduced Charge  
SUS: Signal Underwater Sound

## RESTRICTION CODES

X: May be used against SSN or diesel-electric submarines  
Y: May be used against diesel-electric submarines

Z: Not to be used without specific SUBOPAUTH approval  
N: Not to be used against any submarine.

## NOTES

**General Notes** - Applicable to All Relevant Submarines

A: May only be used provided they are hand thrown from ships/helos.

**Specific Notes** - Applicable to Submarines of Nationality Indicated

FRA 1: Minimum water depth is 1000 meters.

GRC 1: This weapon is always to be used in its deep setting.

ITA 1: Only shallow setting authorized.

ITA 2: Deep setting to be used when signaling COMEX. In all other circumstances only shallow setting is authorized.

NLD 1: Minimum submarine depth is 15 meters (50 feet).

TUR 1: Minimum submarine depth 30 meters (100 feet).

TUR 2: Minimum submarine depth 45 meters (150 feet).

TUR 3: Minimum submarine depth 15 meters (50 feet).

TUR 4: Used only to COMEX. Not to be dropped near submarine.

GBR 1: For SSN - Minimum submarine keel depth 60 meters (200 feet).

GBR 2: Only authorized for SDSKs with minimum keel depth 42 meters (140 feet).

USA 1: Not authorized for submarines with maximum keel depth of less than 213 meters (700 feet).

USA 2: Use of the Marine Sound Signal Mk. 2 is not allowed with US submarines. The Marine Sound Signal Mk. 1 may be used as indicated.

USA 3: Authorized for unrestricted operations from periscope to test depth against US submarines with keel depths greater than 125 meters (412 feet).

USA 4: Use is authorized against 596/637 Class nuclear submarines only.

USA 5: Maximum depth setting is limited to 5 meters (15 feet). Not authorized for submarines with maximum keel depth of less than 213 meters (700 feet).

Table 2-7. (NU) Explosive Charges to be Used in Exercises Against Submarines

| 1        | 2       | 3                                    | 4                              | 5                                                                    |     |     |     |     |     |     |     |     |     |     |     |     |  | 6                                | 7                       |
|----------|---------|--------------------------------------|--------------------------------|----------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|----------------------------------|-------------------------|
| Line No. | Made In | Designation of Charges/ Total Weight | Explosive Content of Charges   | Nationality of Submarines Against Which Weapon or Charge May Be Used |     |     |     |     |     |     |     |     |     |     |     |     |  | Weapon Depth Setting Meters (ft) | Remarks (See Notes)     |
|          |         |                                      |                                | CAN                                                                  | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |  |                                  |                         |
| 1        | BEL     | M 50                                 | 95g – 35% TNT<br>65% saltpetre | Z                                                                    | X   | N   | N   | N   | X   | X   | N   | Y   | Y   | Z   | X   | N   |  | 4                                |                         |
| 2        | BEL     | M 62                                 | 95g - 35% TNT<br>65% saltpetre | Z                                                                    | X   | N   | N   | N   | X   | X   | N   | Y   | Y   | Z   | X   | N   |  | 4                                |                         |
| 3        | BEL     | MSS Mk 7                             | 28g debrix                     | Y                                                                    | X   | Y   | Y   | Y   | X   |     | Y   |     | Y   | Y   | X   |     |  |                                  |                         |
| 4        | BEL     | MSS Mk 5                             | 28g pentolite                  | Y                                                                    | X   | X   | Y   | Y   | X   | X   | Y   | Y   |     | Y   | X   | N   |  |                                  |                         |
| 5        | CAN     | SUS Mk 400<br>Mod 0                  | 1.8 lb TNT                     | Z                                                                    | N   | N   | N   | N   | Z   | Z   | N   | N   |     | N   | Z   | N   |  | 18 (60)<br>182 (600)             |                         |
| 6        | CAN     | SUS Mk 400<br>Mod 3                  | 1.8 lb TNT                     | Z                                                                    | N   | N   | N   | N   | Z   | Z   | N   | N   |     | N   | N   | N   |  | 18 (60)<br>183 (600)             |                         |
| 7        | CAN     | SUS Mk 401<br>Mod 3                  | 1 oz tetryl                    | Y                                                                    | X   | X   | Y   | Y   | X   | X   | X   | Y   | Y   | X   |     | Z   |  | 18 (60)<br>182 (600)             | GRC 1<br>ITA 1<br>TUR 2 |

Table 2-7. Explosive Charges to be Used in Exercises Against Submarines (NU)

**Notes:**

1. Non-metric values in Specific Notes and in Column 6 are accurate.
2. Metric values are rounded off to the nearest meter.
3. Conversion table for equivalent amount or TNT.

| EXPLOSIVE                 | CONVERSION        |
|---------------------------|-------------------|
| TNT (Trotyl)              | 1.00 1 lb = 454g  |
| Tetryl                    | 1.14 1 oz = 28.4g |
| Plastic Explosive         | .20 1 Kg = 2.2 lb |
| Pentolite                 | 1.12              |
| A5 (similar to Pentolite) | 1.19              |

| 1        | 2       | 3                                       | 4                                     | 5                                                                       |     |     |     |     |     |     |     |     |     |     |     |     | 6                                   | 7                                |
|----------|---------|-----------------------------------------|---------------------------------------|-------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------|----------------------------------|
| Line No. | Made In | Designation of Charges/<br>Total Weight | Explosive Content of Charges          | Nationality of Submarines Against Which<br>Weapon or Charge May Be Used |     |     |     |     |     |     |     |     |     |     |     |     | Weapon Depth Setting<br>Meters (ft) | Remarks<br>(See Notes)           |
|          |         |                                         |                                       | CAN                                                                     | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |                                     |                                  |
| 8        | CAN     | SUS Mk 411 Mod 0                        | 1 oz tetryl                           | Y                                                                       | X   | X   | Y   | Y   | X   | X   | X   | Y   | Y   | X   | Z   | Z   | 18 (60)<br>182 (600)                | GRC 1<br>ITA 1<br>TUR 2<br>GBR 1 |
| 9        | CAN     | Mk NC1 Mod 1                            | 0.75 oz plastic explosive             | Y                                                                       | X   | X   | Y   | N   | X   | X   | X   | Y   | Y   | X   | X   | N   |                                     |                                  |
| 10       | DEU     | SUS MSS DM 109                          | 55g tetryl                            | Z                                                                       | X   | X   | N   | N   | Z   | X   | Z   | Y   | Y   | Z   | N   | Z   | 3 (10) to 10 (35)<br>(max)          | USA 1<br>USA 5                   |
| 11       | DEU     | SUS MSS DM 119 (425g)                   | 31g tetryl                            | Y                                                                       | X   | Y   | Y   | Y   | Y   |     | Z   | Y   |     | Y   | N   |     |                                     |                                  |
| 12       | ITA     | SUS MSS DC 103 (800g)                   | 32g DPX-1 (Plastic Explosive) Type II |                                                                         |     | Y   |     | Y   |     |     |     |     |     |     | N   |     | 3 (10) to 10 (35)                   |                                  |

Table 2-7. Explosive Charges to be Used in Exercises Against Submarines (Cont'd) (NU)

**Notes:**

1. Non-metric values in Specific Notes and in Column 6 are accurate.
2. Metric values are rounded off to the nearest meter.
3. Conversion table for equivalent amount or TNT.

| EXPLOSIVE                 | CONVERSION        |
|---------------------------|-------------------|
| TNT (Tetryl)              | 1.00 1 lb = 454g  |
| Tetryl                    | 1.14 1 oz = 28.4g |
| Plastic Explosive         | .20 1 Kg = 2.2 lb |
| Pentolite                 | 1.12              |
| A5 (similar to Pentolite) | 1.19              |

| 1        | 2       | 3                                     | 4                            | 5                                                                    |     |     |     |     |     |     |     |     |     |     |     |     | 6                                | 7                   |
|----------|---------|---------------------------------------|------------------------------|----------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------|---------------------|
| Line No. | Made In | Designation of Charges/ Total Weight  | Explosive Content of Charges | Nationality of Submarines Against Which Weapon or Charge May Be Used |     |     |     |     |     |     |     |     |     |     |     |     | Weapon Depth Setting Meters (ft) | Remarks (See Notes) |
|          |         |                                       |                              | CAN                                                                  | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |                                  |                     |
| 13       | NLD     | NL SUS-AX Mk 3 (256 g)                | 1.1oz tetryl                 | Y                                                                    | X   | X   | Y   | N   | X   | X   | Z   | Y   | Y   | Y   | N   | Z   | 10.5 +/- 1.5 (35 +/- 5)          | ITA 1               |
| 14       | PRT     | SUA - Signal Underwater Acoustic/500g | 28.4g pentolite              | Y                                                                    | X   | X   | Y   | Y   | Y   | X   | X   | Y   |     | Y   | X   | Z   |                                  | GBR 1 A.            |
| 15       | GBR     | MSS Mk 8/31                           | 31g A5                       |                                                                      |     | Y   |     |     |     |     | Y   |     |     |     | N   |     |                                  |                     |
| 16       | GBR     | MSS Mk 8                              | 28g A5                       | Y                                                                    |     | Y   | Y   | Y   |     | Y   | Y   | Y   | Y   | Y   | X   | N   | 10(33)                           | GBR 1               |
| 17       | GBR     | UK L1A1 MSS                           | 33.4g TNT NEQ                |                                                                      |     |     |     |     |     |     |     |     |     |     |     |     |                                  |                     |
| 18       | USA     | DC Marker Mk 2-0 (Night)              | 1.3kg calcium carbide        | Z                                                                    | N   | N   | N   | N   | X   | X   | N   | Y   | Y   | X   | N   | N   |                                  | TUR 3 NLD 1         |
| 19       | USA     | Grenade Mk 2                          | 50g TNT                      | Z                                                                    | X   | X   | N   | N   | X   | X   | N   | Y   | Y   | X   | N   | N   |                                  | A.                  |
| 20       | USA     | Grenade Mk 3A1                        | 0.5lb TNT                    | Z                                                                    | N   | N   | N   | N   | Z   |     | N   | N   | Z   | X   | N   | N   |                                  | TUR 1 A.            |

Table 2-7. Explosive Charges to be Used in Exercises Against Submarines (Cont'd) (NU)

**Notes:**

1. Non-metric values in Specific Notes and in Column 6 are accurate.
2. Metric values are rounded off to the nearest meter.
3. Conversion table for equivalent amount or TNT.

**EXPLOSIVE**

TNT (Trotyl)

Tetryl

Plastic Explosive

Pentolite

A5 (similar to Pentolite)

**CONVERSION**

1.00 1 lb = 454g

1.14 1 oz = 28.4g

.20 1 Kg = 2.2 lb

1.12

1.19

| 1        | 2       | 3                                    | 4                            | 5                                                                    |     |     |     |     |     |     |     |     |     |     |     |     | 6                                | 7                    |
|----------|---------|--------------------------------------|------------------------------|----------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------|----------------------|
| Line No. | Made In | Designation of Charges/ Total Weight | Explosive Content of Charges | Nationality of Submarines Against Which Weapon or Charge May Be Used |     |     |     |     |     |     |     |     |     |     |     |     | Weapon Depth Setting Meters (ft) | Remarks (See Notes)  |
|          |         |                                      |                              | CAN                                                                  | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |                                  |                      |
| 21       | USA     | Grenade Mk 3A1                       | 0.5 lb TNT                   | Z                                                                    | N   | N   | N   | N   | Z   |     | Z   | N   | Z   | X   | N   | N   | 15 (50)<br>91 (303)              | TUR 1 A              |
| 22       | USA     | Grenade Mk 50 Mod 1                  | 2.6 oz tetryl                | Z                                                                    | X   | N   | N   | N   | Z   |     | X   | Y   | Y   | Z   | N   | N   |                                  |                      |
| 23       | USA     | Practice Bomb AN Mk 23               | UNK                          | Z                                                                    | N   | N   | N   | N   | X   |     | Z   | Z   | Z   | Z   | X   | N   |                                  |                      |
| 24       | USA     | Practice Bomb AN Mk106 Mod 3         | UNK                          | Z                                                                    | N   | N   | N   | N   | X   |     | Z   | Z   | Z   | Z   | X   | N   |                                  |                      |
| 25       | USA     | PDC Mk 15 Mod 1                      | 2.9 oz tetryl                | Z                                                                    | Z   | N   | N   | N   | X   |     | Z   | Z   | Y   | Z   | Z   | N   | 15 (50)                          | 15 (50)<br>106 (350) |
| 26       | USA     | PDC Mk 15 Mod 8                      | UNK                          | Z                                                                    | N   | N   | N   | N   | Z   |     | Z   | Z   | Z   | Z   | Z   | N   | 15 (50)                          |                      |
| 27       | USA     | SUS Mk 50 Mod 0                      | 1.8 lb TNT                   | Z                                                                    | N   | N   | N   | N   | Z   |     | Z   | N   |     | N   | Z   | N   | 15 (50)<br>106 (350)             |                      |
| 28       | USA     | SUS Mk 50 Mod 2                      | 1.1 oz tetryl                | Y                                                                    | N   | X   | Y   | Y   | X   |     | X   | Y   |     | Y   | X   | N   | 15 (50)<br>106 (350)             | ITA 2                |

Table 2-7. Explosive Charges to be Used in Exercises Against Submarines (Cont'd) (NU)

**Notes:**

1. Non-metric values in Specific Notes and in Column 6 are accurate.
2. Metric values are rounded off to the nearest meter.
3. Conversion table for equivalent amount or TNT.

| EXPLOSIVE                 | CONVERSION        |
|---------------------------|-------------------|
| TNT (Trotyl)              | 1.00 1 lb = 454g  |
| Tetryl                    | 1.14 1 oz = 28.4g |
| Plastic Explosive         | .20 1 Kg = 2.2 lb |
| Pentolite                 | 1.12              |
| A5 (similar to Pentolite) | 1.19              |

| 1        | 2       | 3                                    | 4                            | 5                                                                    |     |     |     |     |     |     |     |     |     |     |     |     | 6                                | 7                                 |
|----------|---------|--------------------------------------|------------------------------|----------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------|-----------------------------------|
| Line No. | Made In | Designation of Charges/ Total Weight | Explosive Content of Charges | Nationality of Submarines Against Which Weapon or Charge May Be Used |     |     |     |     |     |     |     |     |     |     |     |     | Weapon Depth Setting Meters (ft) | Remarks (See Notes)               |
|          |         |                                      |                              | CAN                                                                  | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |                                  |                                   |
| 29       | USA     | SUS Mk 57 Mod 0                      | 1.8 lb TNT                   | Z                                                                    | N   | N   | N   | N   | Z   |     | N   | N   | Z   | N   | Z   | N   | 243 (800)                        | A.<br><br>GRC 1<br>ITA 1<br>TUR 2 |
| 30       | USA     | SUS Mk 59 Mod 0                      | 1.8 lb TNT                   | Z                                                                    | N   | N   | N   | N   | Z   |     | N   | N   | Z   | N   | Z   | N   | 304 (1000)<br>5486 (18000)       |                                   |
| 31       | USA     | SUS Mk 59 Mod 1                      | 4.1 lb TNT                   | Z                                                                    | N   | N   | N   | N   | Z   |     | N   | N   |     | N   | Z   | N   | 304 (1000)<br>5486 (18000)       |                                   |
| 32       | USA     | SUS Mk 61 Mod 0                      | 1.8 lb TNT                   | Z                                                                    | N   | N   | N   | N   | Z   |     | N   | N   | Z   | N   | Z   | N   | 18 (60)<br>243 (800)             |                                   |
| 33       | USA     | SUS Mk 64 Mod 0                      | 1.1 oz tetryl                | Y                                                                    | X   | X   | N   | Y   | X   |     | X   | Y   | Y   | X   | X   | Z   | 18 (60)<br>243 (800)             |                                   |
| 34       | USA     | SUS Mk 78 Mod 1                      | 1.7 lb TNT                   | Z                                                                    | N   | N   | N   | N   | Z   |     | N   | N   | Z   | N   | Z   | N   | 457 (1500)                       |                                   |

Table 2-7. Explosive Charges to be Used in Exercises Against Submarines (Cont'd) (NU)

**Notes:**

1. Non-metric values in Specific Notes and in Column 6 are accurate.
2. Metric values are rounded off to the nearest meter.
3. Conversion table for equivalent amount or TNT.

| EXPLOSIVE                 | CONVERSION        |
|---------------------------|-------------------|
| TNT (Tetryl)              | 1.00 1 lb = 454g  |
| Tetryl                    | 1.14 1 oz = 28.4g |
| Plastic Explosive         | .20 1 Kg = 2.2 lb |
| Pentolite                 | 1.12              |
| A5 (similar to Pentolite) | 1.19              |

| 1        | 2       | 3                                       | 4                            | 5                                                                       |     |     |     |     |     |     |     |     |     |     |     |     | 6                                | 7                  |
|----------|---------|-----------------------------------------|------------------------------|-------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------|--------------------|
| Line No. | Made In | Designation of Charges/<br>Total Weight | Explosive Content of Charges | Nationality of Submarines Against Which<br>Weapon or Charge May Be Used |     |     |     |     |     |     |     |     |     |     |     |     | Weapon Depth Setting Meters (ft) | Remark (See Notes) |
|          |         |                                         |                              | CAN                                                                     | FRA | DEU | GRC | ITA | NLD | NOR | POL | PRT | ESP | TUR | GBR | USA |                                  |                    |
| 35       |         | Depth Charge (day)<br>Mk 1 Mod 1        | Black powder                 | Z                                                                       | X   | N   | N   | N   | X   |     | N   | Z   |     | X   | N   | N   |                                  | TUR1               |
| 36       | FRA     | SUS Hand Grenade<br>MOD1937<br>(297G)   | 90g Pentolite                | Z                                                                       | X   | N   |     |     | Z   |     | Z   |     | Z   | Z   |     |     | 5 (16)                           | FRA 1<br>A         |

Table 2-7. Explosive Charges to be Used in Exercises Against Submarines (Cont'd) (NU)

**Notes:**

1. Non-metric values in Specific Notes and in Column 6 are accurate.
2. Metric values are rounded off to the nearest meter.
3. Conversion table for equivalent amount or TNT.

| EXPLOSIVE                 | CONVERSION        |
|---------------------------|-------------------|
| TNT (Trotyl)              | 1.00 1 lb = 454g  |
| Tetryl                    | 1.14 1 oz = 28.4g |
| Plastic Explosive         | .20 1 Kg = 2.2 lb |
| Pentolite                 | 1.12              |
| A5 (similar to Pentolite) | 1.19              |

**2.2.50 ASW EXERCISE RESTRICTIONS**

**2.2.51 ASW INVESTIGATION RESTRICTIONS**

(NU) Investigation of Contact by ASW Ships. No ship is to deliberately approach a contact closer than 1200 yards, and no ship with VDS streamed is to approach closer than 4000 yards unless Relaxation 4\*E is in force. In this case it must be noted that it may be dangerous for the submarine, when Relaxation 2J is granted, if Relaxation 4E is in force.

**2.2.52 ASW EXERCISE ATTACK RESTRICTIONS**

2.2.52.1. (NU) Unless otherwise stated in the orders for the exercise, ASW ships and aircraft may simulate attack on submarines subject to the restrictions contained in the paragraphs which follow:

**a. Restrictions - Surface Ship Attacks**

- (1) No attempt or threat to ram a submarine or a submarine periscope is to be made.
- (2) ASW ships are to avoid passing directly over a submarine believed to be at less than Safe Depth.
- (3) When simulated attacks are carried out with medium or long range shipborne ASW weapons, COMEX need not be executed until surface ships close within 5000 yards.
- (4) When initiating COMEX by sound signal, and to ensure that the submarine is aware of COMEX, the signal should not normally be made at a range greater than 5000 yards from the submarine.
- (5) No ship is to deliberately approach a contact closer than 1200 yards, and no ship with VDS streamed is to approach closer than 4000 yards, until 5 minutes after COMEX, unless relaxations in force otherwise permit (Relaxations 2\*B, 2\*C or 2\*M).
- (6) All ship weapons and projectiles are to be placed in such a condition that both accidental discharge or release, and exploder activation, are impossible.
- (7) A distinction is to be made between practice projectiles requiring the submarine to be at Safe Depth (hereinafter referred to as HEAVY PROJECTILES), and those for which no special precautions are necessary when fired at dived submarine (hereinafter referred to as LIGHT PROJECTILES). Projectiles reaching a depth in excess of the surface ship draft in force for the exercise (see Relaxation 12\*B and Table 2-2) are to be considered heavy projectiles. If Relaxation 2D or 2\*E is in force, the appropriate type of projectile may be loaded.

(8) (NMM) NOT RELEASABLE.

- (9) Relaxations 2\*B, 2\*C or 2\*M cannot be authorized unless 4\*E is also authorized.

**b. Restrictions - Aircraft Attacks**

- (1) Aircraft are not to carry live bombs, depth charges, homing torpedoes, or rockets (unless it is the specific aim of the CASEX (i.e., E-8) to do so and Relaxation 2\*N has been authorized).
- (2) Extraordinary precautions are to be taken by aircraft to ensure that no machine-gun is loaded with live ammunition prior to or during practice strafing runs.
- (3) Under no circumstances whatever are any sonobuoys, (depth charge) markers, practice bombs, flares, or other missiles to be dropped on a submarine when any portion of the submarine other than its periscope, snorkel, or radar mast is exposed above the surface of the water. The weight of any such missile, except sonobuoys, must never exceed 4.5 kilograms (10 pounds). Sonobuoys may be used as above with prudence, although their weight exceeds 4.5 kilograms (10 pounds).
- (4) No missile shall be dropped on a target if for any reasons the aircraft commander is not certain that the target is a submarine, or if any portion of the submarine other than its periscope, snorkel or radar mast is exposed above the surface of the water. Explosive weapon charges dropped by aircraft must comply with the prescriptions of Article 2240.
- (5) Aircraft carrying out an attack on a submerged submarine and requiring a reply from the submarine are to drop two explosive charges to indicate an attack (Table 5-2). The charges should be dropped five seconds apart. A properly coded Mk 84 ESUS may be used to indicate an attack in lieu of explosive charges (Table 5-5). See Exercise Instruction 172 (Table 3-3).
- (6) Aircraft carrying out an attack on a submerged submarine may drop one or more smoke bombs to indicate the attack, subject to provisions of item (3) above.
- (7) (NMM) NOT RELEASABLE.

**c. Restrictions - Submarine Attacks**

- (1) When attacks by submarines are to be simulated, all torpedoes will be placed in such a condition that neither their accidental discharge nor activation is possible.
- (2) Whenever exercise torpedo firings have been authorized, submarine Commanding Officers will ascertain that those torpedo tubes from

which torpedoes will be fired contain only exercise torpedoes; all other weapons must be placed in the condition described in (1) above. If torpedoes are to be fired by submarines, the responsibility for firing on a safe torpedo course and at a safe torpedo depth rests entirely with the Commanding Officer of the submarine; the target ships are responsible for assuming a suitable damage control condition prior to the firing of the torpedo.

d. **Restrictions on the Marking of Attacks**

- (1) It is desirable that every ASW attack on a submarine by a surface ship or aircraft be assessed or analyzed. However, the marking of attacks in tactical exercises should not be used as an aid to classification; for this reason, the dropping of two charges to mark attacks should be limited to certain basic exercises, the latter periods of ASW action in tactical exercises, and those cases in which it is required to analysis the result of VECTACs.
- (2) Units should not drop explosive charges over the estimated position of submarines since there is a risk of causing serious damage to the submarine if the charges explode in contact with the hull.

e. **Abandonment of Attacks.** All attacks are to be broken off and the period of attack is considered to be over as follows:

- (1) Five Minutes before the scheduled time of ending each ASW action (FINEX), or five minutes before STOP TIME if this is earlier.
- (2) At the desire of the submarine, in which case the indication to surface ships and aircraft may be:
  - a) The sighting of a Red pyrotechnic;
  - b) An unexpected pyrotechnic signal for which there is no satisfactory explanation; and
  - c) The reception of unexpected transmission of SST or UWT not in answer to explosive signals. In this event, all surface ships and aircraft taking part in the exercise are to be informed by the unit receiving the transmissions.
- (3) At the desire of any surface ships or aircraft.

**2.2.53 (NMM) NOT RELEASABLE**

**2.2.54 NIGHT ASW EXERCISE RESTRICTIONS**

2.2.54.1. (NU) Unless otherwise stated in the orders for the exercise, the following special restrictions apply during ASW exercises by night:

- a. Only sonobuoys, Mk 84 ESUS, and smoke/light markers are to be dropped by aircraft unless Relaxation 2G is in force.
- b. Ships are to show navigation lights at full brilliance unless Relaxations 6C, 6\*D, 6E or 6\*F are in force (Table 3-2).
- c. The exercise area is to be reasonably clear of other shipping.
- d. In night encounter exercises, the target ship (and screen, if applicable) is to be limited in speed and evasive steering. Such limits are to be agreed to by operating authorities of ships and submarines and are dependent on the experience of the submarine Commanding Officer.
- e. Only pyrotechnic signals that give visible flames are to be used by the submarine.
- f. Submarines are to show navigation lights at full brilliance when on the surface unless Relaxation 6A or 6B is in force (Table 3-2).

**2.2.55 - 2.2.59 Spare****2.2.60 POSITIONING OF SURFACE SHIPS AND HELICOPTERS WHILE SUBMARINES DIVE**

2.2.60.1. (NU) In Elementary Exercises, when the submarine dives in the vicinity of ships and/or helicopters, they should station themselves at least 1500 yards off the submarine's signaled diving course unless otherwise specified. VDS/ DTAS ships may stream VDS/DTAS before the rendezvous for CASEXes A1, A2, C1 and E2 provided that they remain at least 1500 yards off the submarines signaled diving course. The submarine is to be informed that the VDS/ DTAS is streamed and its streamed depth.

2.2.60.2. (NU) The submarine is required to signal her proposed diving course. This will most likely be a course beam to sea. The submarine will signal when it is ready to dive. When the submarine reports "READY" the OCS or delegated unit orders "DIVE FOR SERIAL ..."

2.2.60.3. (NU) Submarines require time to adjust their submerged trim after diving and before going to a safe depth. This usually is done at PD to ensure that it is safe to return to the surface should this be necessary. The submarine should show as much periscope as possible during the trimming operation, which may take up to 10 minutes.

2.2.60.4. (NU) After the initial trim has been caught, subsequent dives can be made directly to Safe Depth. ASW units must not start ASW action until the submarine reports "I am at correct depth, course and speed and am ready to commence the exercise (KKK)" (Table 5-4).

2.2.60.5. (NU) The following procedure is to be used:

- a. Establish radio communications with the submarine prior to GO TIME.
- b. Conduct time check with all units.
- c. Confirm submarine's position.
- d. Submarine reports intended diving course to OCS or delegated controlling unit.
- e. When the diving course is established the OCS or controlling unit will order units to take station laterally at least 1500 yards from the submarine's diving course unless otherwise specified.
- f. If ships have VDS/DTAS streamed, then the OCS or controlling unit must report this to the submarine. This report must include at what depth VDS/DTAS is streamed.
- g. Submarine signals "READY" when ready to dive.
- h. On receiving "READY" the submarine is ordered to dive by the OCS or controlling unit "DIVE FOR SERIAL .....".
- i. When at SAFE DEPTH the submarine will report "I am at correct depth, course and speed and am ready to commence the exercise" or "KKK" (Table 5-4).

**2.2.61 - 2.2.69 Spare**

**2.2.70 BRING A SUBMARINE FROM SAFE DEPTH TO PD**

**2.2.71 RESPONSIBILITIES FOR SUBMARINE SAFETY WHEN RETURNING TO PD**

2.2.71.1. (NU) The Commanding Officer of the submarine is responsible for submarine safety. The decision to leave Safe Depth and proceed to PD should only be made when the submarine CO is satisfied that it is safe to do so.

2.2.71.2. (NU) If it is desired that the submarine not return to PD at FINEX or STOP TIME, arrangements should be made with the OCE prior to the start of the exercise (see Relaxations 3A, 3B, 3\*H).

**2.2.72 SURFACING METHODS AND PROCEDURES**

2.2.72.1. (NU) The following procedures are to be used when required to bring a submarine from Safe Depth to PD.

- a. Method ALFA. Surfacing method ALFA consists of the procedures described in Article 2.2.73 and is the standard method for a submarine to change depth from Safe Depth to PD.

- b. Method ALFA is a controlled procedure which is normally used to bring submarines to PD at FINEX or STOP TIME. Method ALFA requires communications between the ship tasked with the procedure and the submarine in order to establish the submarine's position and pass a surface SITREP.
- c. Method BRAVO. Surfacing method BRAVO is an alternative method for a submarine to change from Safe Depth to PD at FINEX or STOP TIME, and consists of the procedures described in Article 2.2.74. It is only to be used when Relaxation 3\*J is authorized for use and when ordered in the CASEX message.
- d. Method BRAVO allows the submarine Commanding Officer to bring his submarine to PD expeditiously and safely upon completion of a CASEX. This is accomplished by surface units clearing the immediate area in which the submarine was operating on the Safety Course or its reciprocal while cavitating and transmitting on SRS/MRS whichever course opens from the last known position of the submarine. Even if some ships are on the Safety Course and others are on the reciprocal, the main concern of the submarine Commanding Officer is that ships are well clear of his track before he brings his submarine to PD.

**2.2.73 CONDUCT AND PROCEDURES FOR SURFACE SHIPS AND/OR HELICOPTERS IN THE VICINITY OF A SUBMARINE THAT IS COMING TO PD - METHOD ALFA**

2.2.73.1. (NU) **Conduct of the Submarine.** A submarine intending to come to PD from a Safe Depth when ships and/or helicopters are in the vicinity is to carry out the following procedures unless Relaxations 3\*K, 8\*E and/or 9\*F are in force:

- a. Turn to the Safety Course.
- b. Fire two yellow/white pyrotechnic signals spaced three minutes apart ... Use yellow/white smokes by day and white flares by night. On firing each smoke/flare, transmit "QQQ" by UWT or SST (Table 5-4).
- c. Upon receipt of "DDD" and/or five charges, the submarine returns to PD if the submarine Commanding Officer is satisfied that it is safe to do so. Once PD has been regained, the responsibility for avoiding collision rests entirely with the submarine. After regaining PD; therefore, the submarine is entirely free to alter course as necessary to surface if required by exercise instructions. This would normally be carried out into the sea/swell.
- d. If signal "JJJ", signal A3, and/or MK 84 Code 2 are received, remain at safe depth. Mark position upon receipt of signal "QQQ" or signal A2. Restart surfacing procedures after signal "PPP" is received.
- e. Once PD has been regained, inform surface units the submarine is at PD.

**Note.**

*If at FINEX or STOP TIME the submarine and participating units are not in contact (for any reason), the submarine will return to PD when the Commanding Officer considers it safe to do so. The submarine will steer the Safety Course and fire two pyrotechnics three minutes apart to indicate the course and that the submarine is returning to PD.*

**2.2.73.2. (NU) Conduct of Ships and Helicopters.** All ASW units in the vicinity of a submarine known to be coming to PD are to act as follows:

- a.
  - (1) Raise helicopter sonar systems and decoys to a depth of 30 metres (98 feet) or less, or the reduced ship's draft which may be authorized by relaxation 12\*B.
  - (2) Raise VDS/DTAS to a cable length not exceeding 30 metres (98 feet) or the cable length authorized by Relaxation 8\*G. CATAS need not be recovered. However, it should be noted that CATAS must always be recovered during surfacing procedures with Italian submarines.
  - (3) Inform the ASW unit assigned the responsibility for surfacing the submarine, of the actual VDS/DTAS cable length.
- b. Take position to remain a distance of at least 1500 yards off the submarine course, if known. It should be noted that sonar fixes may be unreliable since units may be in contact with a non-submarine contact.
- c.
  - (1) If the submarine position is known (for example, sonar fix confirmed by the Mark-Snap procedure), steer the ordered safety course or it's reciprocal as ordered.
  - (2) If they have a short range sonar - normal transmission watch.
- d. During the entire time that the submarine is coming to PD, proceed at above cavitation speed and at not less than 12 knots (unless Relaxation 3\*G is in force), secure Prairie Masker if applicable, and have switched off or recovered decoys. At night, show navigation lights at full brilliance. If a ship must stop during the surfacing procedure, it is to tap the hull, run its echo sounder or make some other form of noise until voice communication is established with the submarine.
- e.
  - (1) Ships fitted only with medium or long range sonar systems may transmit at low power, provided underwater telephone communications can be established and maintained.
  - (2) Ships with VDS/DTAS streamed (Relaxation 8\*G) are to apply the following special transmitting procedure:
    - a) If they have a short range sonar – normal transmission watch.

- b) If they have medium or long range sonar - normal transmissions at low power or 3 transmissions every 5 minutes if required to establish and maintain UWT communications. If UWT communications cannot be established - normal transmission watch.
  - c) If they cannot transmit with any of their sonar systems act in accordance with Article 2.2.36.
  - d) Except in an emergency, units should not transmit on underwater telephone from the time the submarine acknowledges the all-clear-to-surface signal (DDD) until the submarine is at PD.
- (3) When authorization B is applicable (Table 2-5), ships with CATAS streamed must comply with the rules of Article 2.2.38.1.a (3).
- f. Keep a sharp lookout for the submarine while it is coming to PD. Should the submarine be on a course or in a position other than anticipated, ships should be ready to move clear of the submarine immediately.

2.2.73.3. (NU) **Conduct of ASW Units Responsible for Executing the Surfacing Procedure.** The ASW unit assigned by the OTC/OCS with the responsibility of bringing the submarine up to PD, should in addition to Article 2.2.73.2:

- a. Warn units which are not complying with the preceding procedures;
- b. Maintain UWT listening watch (see Article 2.2.18);
- c. Exchange range by MARK-SNAP method;
- d. Upon sighting the first pyrotechnic from the submarine, make "ROGER SMOKE, Bearing ..." on UWT (if fitted) or "QPQ" on SST;
- e. Upon sighting the second pyrotechnic from the submarine, make "ROGER SMOKE, Bearing ..." on UWT (if fitted) or "QPQ" on SST; and
- f. Pass a surface situation report on UWT.

**Note.**

*Example of Surface SITREP:*

*This is not to be considered a mandatory format, but is an illustration of the type of information of interest to submarines. If UWT communications are difficult, the information passed should be kept to a minimum consistent with submarine safety to prevent unnecessary delays in coming to PD. If exercises are of short duration, only significant changes to visibility, wind, and sea conditions need be transmitted. Position reports may be delayed until the submarine is at PD. The position of all ships within five miles, and those within 10 miles which are closing, should be included.*

*"L6X this is 2PG ROGER SMOKE standby Surface SITREP.*

*1. Your position at 1203, 175 position AA 15 miles.*

*2. Visibility 7 miles.*

*3. Wind 230 15 knots.*

*4. Sea and swell from 230, height 1 metre (3 feet).*

*5. 2PG bears 165 degrees, 200 yards from you, steering safety course, VDS streamed to 30 metres (98 feet), 5XC bears 010, 2300 yards from you, steering safety course. One tanker bears 330 degrees, 4 miles, course 090, speed 15 knots, will pass 2 miles north of you. No other ships 5 miles. Over."*

- g. Inform the submarine of any ship in the vicinity which has VDS/ DTAS streamed to a greater depth than allowed during the surfacing procedure, and of the depth to which the VDS/DTAS is streamed. This may be necessary if bad weather restricts the recovery of VDS/DTAS.
- h. Once the position of the submarine has been definitely established and it is safe for the submarine to come to periscope depth in the next 10 minutes, transmit "DDD" on UWT or SST or signal A5 (five charges) or signal MK84 Code 3, unless Relaxation 3\*E is in force. If it is NOT SAFE for the submarine to come to periscope depth, pass "JJJ" on UWT or SST or signal A3 (three charges) or signal MK 84 Code 2. If in any doubt that "JJJ" or MK 84 Code 2 has been received by the submarine, signal A3 must also be made.
- i. If "JJJ", signal A3, or signal MK 84 Code 2 have been made, the entire surfacing procedure must be restarted as described above.
- j. The surfacing procedure may be considered as completed when the submarine has reported that it is at PD and operations normal.
- k. If no communications have been established at STOP TIME Plus one hour, return to the last known position of the submarine, initiate a search, attempt to establish communications by all means possible and follow the instructions of ATP-10/ATP-57 (see Note at end of Chapter 2).

## **2.2.74 CONDUCT AND PROCEDURES FOR SURFACE SHIPS AND/OR HELICOPTERS IN THE VICINITY OF A SUBMARINE THAT IS COMING TO PD - METHOD BRAVO**

**2.2.74.1. (NU) Conduct of the Submarine.** When Relaxation 3\*J is in force, a submarine intending to come to PD from Safe Depth when ships and/or helos are in the vicinity, is to carry out the following procedures unless Relaxation 3\*K, 8\*E and/or 9\*F are in force:

- a. Turn to the safety course;
- b. May fire pyrotechnics to indicate his position; and

- c. When it is considered safe to do so by the submarine CO, return to PD and contact the OTC/OCS on UHF, HF or VHF.

2.2.74.2. (NU) **Conduct of Ships and Helicopters.** All ASW units in the vicinity of a submarine known to be coming to PD are to act as follows:

- a. Raise helicopter sonar and decoys to a depth of 30 metres (98 feet) or less or to the reduced ship's draft which may be authorized by Relaxation 12\*B;
  - (1) Before FINEX or STOP TIME, raise VDS/DTAS to a cable length not exceeding 30 metres (98 feet), or the cable length authorized by Relaxation 8\*G - CATAS need not be recovered. However, it should be noted that CATAS must always be recovered during surfacing procedures with Italian sub-marines.
- b. Assume the safety course or reciprocal, whichever course opens from the last known position of the submarine. At times it may be desirable for the OTC/OCS to order ships to steer either the safety course or the reciprocal if the OCS wishes to keep the formation together for subsequent operations. This should only be done if the submarine's position is known and all ships are displaced at least 1500 yards off the submarine's course.
- c. At STOP TIME the OTC/OCS may assign an ASW unit, which is the nearest unit from the probable submarine position, with the responsibility to pass a short surface Situation Report on UWT (blind transmission). The surface SITREP is passed once all units are on the safety course (or it's reciprocal). SITREP only contains the position of all non-exercise ships within 5 miles of the forces and those within 10 miles which are closing.
- d. During the entire time that the submarine is coming to PD, proceed at above cavitation speed and at not less than 12 knots unless Relaxation 3\*G is in effect, and at night show navigation lights at full brilliance, and secure Prairie Masker if applicable. If a ship must stop during the surfacing procedure, it is to tap its hull, run its echo sounder or make some form of noise until voice communication is established with the submarine. Ships must transmit continuously on SRS/MRS from FINEX until UHF/HF/VHF communications with the submarine have been established.
- e. If no communications have been established at STOP TIME plus one hour, return to the last known position of the submarine, initiate a search, attempt to establish communications by all means possible and follow the instructions of ATP-10/ATP-57 (see Note at end of Chapter 2).

## 2.2.75 CONDUCT OF ASW SHIPS AT STOP TIME

2.2.75.1. (NU) The procedures for the submarine returning to PD outlined in Articles 2.2.72, 2.2.73 and 2.2.74 (Methods ALPHA and BRAVO) apply at STOP TIME (unless Relaxations 3\*F, 3\*H or 3\*K are authorized) in the following cases:

- a. The ASW ships are in contact with the submarine.

- b. The ASW ships are not in contact with the submarine, but are remaining in the exercise area.

If no contact has been established with the submarine at STOP TIME plus one hour, return to the last known position of the submarine, initiate a search, attempt to establish communications by all means possible and follow the instructions of ATP-10/ATP-57 (see Note at end of Chapter 2).

**NOTE 1:**

*The ASW ships are allowed to depart the exercise area before STOP TIME when relaxation 3\*H is authorized, but continue to observe safety precautions in accordance with serial instructions in force, whilst operating in the ASW exercise area, until STOP TIME.*

**NOTE 2:**

*When the procedure for returning to PD is applied, Relaxations 3\*G, 8\*G and 12\*B, if authorized, remain in effect until the submarine returns to PD.*

**2.2.76 - 2.2.79 Spare**

**2.2.80 (NMM) NOT RELEASABLE**

**2.2.81 - 2.2.89 Spare**

**2.2.90 ASW EXERCISES IN SHALLOW AND CONFINED WATERS**

2.2.90.1.(NU) In shallow and confined waters submarines have a need to update their position frequently to ensure safe navigation. In planning ASW exercises, the following should be taken into consideration:

- a. Duration of ASW action.
- b. Establishment of a special safety area where prosecution of contacts by surface forces is prohibited. The special safety area should be established for submarine safety only, and not in order to give the submarine tactical advantage.

**Note:**

- \* ATP-57 takes precedence for the conduct of submarine rescue operations.
- \* ATP-10 remains a search and rescue document in general.

**INTENTIONALLY BLANK**

## CHAPTER 3

### STANDARD EXERCISES AND METHOD OF ORDERING

#### 3.1 SUMMARY OF STANDARD EXERCISES

3.1.1. (NU) Standard ASW Exercises (CASEXes) are listed in this Chapter and are grouped as follows:

- (1) A Series - Exercises involving ships and/or Helicopters (Table 3-5)
- (2) B Series - Exercises involving Aircraft (Table 3-6)
- (3) C Series - Exercises involving Multiple Forces (Table 3-7)
- (4) D Series - (NMM) NOT RELEASABLE.
- (5) E Series - Exercises of a Miscellaneous Nature (Table 3-9)
- (6) F Series - Synthetic Exercises for surface ships and aircraft when no submarine is available (Table 3-10)

**Note.**

*CASEX E-6 and E-9 are now promulgated in ATP/MTP-57(C) Chapter 7.*

**Note.**

*A further group of Exercises (S Series) involving Submarines vs Submarines is included in Chapter 4.*

3.1.2. (NU) Within the above series, the exercises have been placed in an approximate degree of complexity. However, by use of the Relaxation Table (Table 3-2), the Exercise Instruction Table (Table 3-3), and Special Instructions, the exercises may be varied to achieve virtually any desired complexity and also provide opportunities for pro-submarine training.

3.1.3. (NU) When the term Unit is used, it signifies a ship or aircraft or a small group of ships and/or aircraft acting as an entity.

3.1.4. (NU) When the term Aircraft is used, it includes both fixed-wing aircraft and helicopters.

3.1.5. (NU) CASEXes may be carried out by day or night unless otherwise specified.

#### 3.2 SUBSTITUTION FOR A SUBMARINE

(NU) In certain joint exercises, a ship may take the place of a submarine when it is desired to exercise Air/Surface Cooperation procedures. A mobile ASW target may take the place of a submarine in any CASEX.

## 3.3 METHOD OF ORDERING EXERCISES

3.3.1. (NU) This article contains information on the method of ordering the various ASW exercises listed in this Chapter.

3.3.2. (NU) Security of the Order Table:

- a. Although AXP-01 is classified NATO Confidential, the major part of the message ordering the exercises does not contain material requiring security and may, subject to any special instructions issued by National or Area Commanders, be passed by unclassified message.
- b. Certain designators however (particularly Q, R and S) may contain information of a classified nature.

## 3.4 ORDER TABLE (TABLE 3-1)

(NU) When scheduling an ASW Exercise, the authority ordering the exercise should first decide which of the exercises in Chapter 3 most nearly meets his requirements. Individual CASEXes list the procedure to be followed for starting, conducting and stopping the exercise. The Order Table should then be used by the authority ordering the exercise in compiling the Operation Order or CASEX message. The authority ordering the exercise should always consider the whole Order Table when compiling his orders, but omitting those headings not applicable or required.

## 3.5 RELAXATION TABLE (TABLE 3-2)

(NU) This table should be used to modify the Safety Precautions, Operating Restrictions and Procedures to make the training more realistic. The use of relaxations will depend on the equipment, capabilities and state of training of the participating units. Certain relaxations are marked with an asterisk (\*) and may only be used subject to the prior approval of the SUBOPAUTH. Exercise planners must obtain this approval before including starred relaxations in operation orders. Relaxations ordered follow the prefix Q in the Order Table.

## 3.6 EXERCISE INSTRUCTIONS (TABLE 3-3)

(NU) This table is to be used in conjunction with the Relaxation Table. These two tables enable the authority ordering the exercise to adapt any of the standard CASEXes to meet his specific requirements. Exercise Instructions ordered should follow the prefixes R, S and T in the Order Table.

## 3.7 SUBMARINE COURSE AND SPEED DIAGRAMS (TABLE 3-4)

3.7.1. (NU) These diagrams may be ordered by the use of the Exercise Instruction Number 121. The authorities ordering these diagrams are to ensure that the submarine can comply with the diagram while still remaining within the exercise area and within sufficient depth of water.

3.7.2. (NU) Diagrams are divided as follows:

- a. High-Speed Runs
- b. Medium-Speed Runs
- c. Slow-Speed Runs

3.7.3. (NU) Except in the case of high speed runs, the first two diagrams in each division are designed for use in a restricted area, and the finishing position corresponds with the starting position. The second two diagrams in each division allow for a small advance along the base course between the beginning and end of the run. These diagrams will be of advantage in a tideway or when starting the exercise in one corner of the exercise area.

3.7.4. (NU) Diagram 56 is a special diagram for use with aircraft for passive/active sonobuoy training.

3.7.5. (NU) The following instructions apply to the Course and Speed Diagrams:

- a. Courses and Speeds are to be taken as through the water, without allowing for tide.
- b. The Base Course (AB) should be arranged before the start of the exercise.
- c. Zero Time (minute 0) is the exact hour immediately preceding the time of execution. If the time of execution is exactly on an hour, that time will be Zero Time. The submarine is to go to the course and speed shown in the diagram for that time relative to Zero Time.
- d. If the run is completed for FINEX, the submarine is to restart the run at Zero Time.
- e. The times shown in the diagrams are the times at which the submarine is to start altering to the new course.

## **3.8 SPECIAL PROCEDURES**

3.8.1. (NU) When exercises require instructions that cannot be ordered by using the tables provided, they should be included under Designator U (Special Instructions) of the Order Table.

3.8.2. (NU) These instructions should be written clearly and concisely and, if possible, should be discussed with all participants before the exercise.

## **3.9 ISSUING CASEX STANDARD INSTRUCTIONS**

(NU) In the interest of brevity, local Commanders may issue CASEX standard instructions which will always apply when ordering CASEXes in their area. For example, the areas and time of Start Time and STOP TIME may be taken as those in the weekly practice programs,

and the Submarine Safety Course within the command area may always be standard unless specifically listed in the Order Table.

### 3.10 – 3.99 Spare

| ORDER TABLE |                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Designator  | Meaning                                                                                                                                             |
| A           | CASEX No.. . . . and/or purpose of the exercise and/or description of the exercise                                                                  |
| B           | Officer Scheduling the Exercise (OSE)                                                                                                               |
| C           | Officer Conducting the Exercise (OCE)                                                                                                               |
| D           | Officer in Tactical Command (OTC)                                                                                                                   |
| E           | Officer Conducting the Serial (OCS)                                                                                                                 |
| F           | Friendly Forces (FRNFOR)                                                                                                                            |
|             | 1. Screened force or convoy                                                                                                                         |
|             | 2. Screen and/or Patrol Group                                                                                                                       |
|             | 3. Name, hull number, active sonar frequency and signal designator type of VDS/Towed Array (Table 2-4) of each VDS/Towed Array ship in the exercise |
|             | 4. Carrier and shipborne aircraft                                                                                                                   |
|             | 5. Land-based aircraft                                                                                                                              |
|             | 6. Submarines (mission to be stated, e.g. escort, patrol, transit . . . . . etc.)                                                                   |
|             | 7. Independent units                                                                                                                                |
|             | 8. Officer in Command - FRNFOR (on board . . . . . or at . . . . .)                                                                                 |

Table 3-1. Order Table (NU)

| <b>ORDER TABLE</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Designator</b>  | <b>Meaning</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| G                  | <p>Opposing Forces (OPFOR)</p> <p>Submarines designated for:</p> <ol style="list-style-type: none"> <li>1. Individual attack</li> <li>2. Coordinated attack</li> <li>3. Tracking (shadowing)</li> <li>4. On passage (in transit)</li> <li>5. On patrol</li> </ol> <p>Cooperating aircraft designated for:</p> <ol style="list-style-type: none"> <li>7. Patrol</li> <li>8. Search</li> <li>9. Tracking (shadowing)</li> <li>10. Strike</li> <li>11. Cooperating ship for:</li> <li>12. ELINT/SIGINT</li> <li>13. Tracking (shadowing)</li> <li>14. Raider, minelayer, etc.</li> <li>15. Officer in Command - OPFOR (on board . . . . . or at . . . . .)</li> </ol> |
| H                  | Zone time to be used throughout the exercises. (GMT to be used whenever possible to avoid confusion.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| J                  | Date and time the exercise is to start (GO TIME)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| JJ                 | Date and time the exercise is to stop (STOP TIME)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| K                  | Duration of ASW actions, if allowed (until STOP TIME may be ordered; but attacks must be broken off five minutes before this time)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Table 3-1. Order Table (Cont'd) (NU)

| ORDER TABLE |                                                                                                                                                                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Designator  | Meaning                                                                                                                                                                                                                                                                                    |
| KK          | Out-of-action period                                                                                                                                                                                                                                                                       |
| L           | Assigned exercise area                                                                                                                                                                                                                                                                     |
| LL          | 1. Rendezvous<br><br>2. Initial position and size of areas of OPFOR submarine(s)                                                                                                                                                                                                           |
| M           | Reference Positions. (The line joining the positions is the centre of a channel or transit lane of stated width.)                                                                                                                                                                          |
| MM          | The width of the channel or transit lane in miles or yards                                                                                                                                                                                                                                 |
| N           | Base Course and speed and/or Mean Line of Advance (MLA):<br><br>1. FRNFOR<br><br>2. OPFOR<br><br>(Must be expressed as a numbered group to avoid confusion with Safety Course)                                                                                                             |
| NN          | Limits of Submarine Operating Area                                                                                                                                                                                                                                                         |
| P           | Safety Course. (Must be expressed as <u>one</u> of the four cardinal points of the compass, i.e. North, South, East or West.)                                                                                                                                                              |
| PP          | 1. FRNFOR submarine ordered depth or allocated depth zones.<br><br>2. OPFOR submarine ordered depth or allocated depth zones.<br><br>3. Submarine Depth Restrictions (see Articles 2.2.13 and (NMM) NOT RELEASABLE.<br><br>4. Exercise Stovepipe/Skylight allocation (see Article 2.2.39). |
| Q           | Relaxations (Table 3-2)                                                                                                                                                                                                                                                                    |
| R           | Exercise Instructions - FRNFOR (Table 3-3). (Not to be communicated to OPFOR.)                                                                                                                                                                                                             |
| RR          | Start position - FRNFOR. (Not to be communicated to OPFOR.)                                                                                                                                                                                                                                |
| S           | Exercise Instructions - OPFOR (Table 3-3). (Not to be communicated to FRNFOR.)                                                                                                                                                                                                             |
| SS          | Start position - OPFOR. (Not to be communicated to FRNFOR.)                                                                                                                                                                                                                                |
| T           | Exercise Instructions - FRNFOR/OPFOR (Table 3-3)                                                                                                                                                                                                                                           |
| U           | Special Instructions                                                                                                                                                                                                                                                                       |

Table 3-1. Order Table (Cont'd) (NU)

| <b>ORDER TABLE</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Designator</b>  | <b>Meaning</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| V                  | <p>Communications means available (quoting tables in Chapters 2 and 5 where applicable):</p> <ol style="list-style-type: none"> <li>1. Radio (Voice or CW with frequency and callsigns)</li> <li>2. Flag (Table 5-6)</li> <li>3. SST (with frequency and callsigns - Table 5-4)</li> <li>4. Specific type of charge (by line number in Table 2-7) and Explosive Charge Signal (Table 5-2)</li> <li>5. Pyrotechnics (Table 5-3)</li> <li>6. Aircraft manoeuvres (Table 5-7)</li> <li>7. Underwater telephone (UWT - Table 5-4)</li> <li>8. ESUS (Table 5-5)</li> </ol> |
| W                  | <ol style="list-style-type: none"> <li>1. Practice weapons to be employed</li> <li>2. Practice weapon settings to be employed:                         <ol style="list-style-type: none"> <li>a. Depth</li> <li>b. Speed</li> <li>c. Running Range</li> <li>d. Explosive Charge</li> </ol> </li> </ol>                                                                                                                                                                                                                                                                |
| WW                 | Ship(s) detailed for practice weapon recovery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| X                  | <p>Records:</p> <ol style="list-style-type: none"> <li>1. Authorities designated for analysis and reporting</li> <li>2. CASEX Forms or FORMEX (specified by FORMEX number) required</li> <li>3. ME-YOU Message</li> <li>4. National Requirements</li> </ol>                                                                                                                                                                                                                                                                                                           |
| Z                  | Movements on completion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Table 3-1. Order Table (Cont'd) (NU)

| TOPIC                                   | RELAXATION NUMBER |    | DEGREE OF RELAXATION PERMITTED                                                                                                                                                                          |
|-----------------------------------------|-------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General                                 | 1                 | A  | All NON-STARRED Relaxations are authorized.                                                                                                                                                             |
| Attacks                                 | 2                 | A  | Spare                                                                                                                                                                                                   |
|                                         |                   | *B | ASW ships may close and carry out simulated attacks at any range without restriction immediately after COMEX. (See Article 2.2.51, 2.2.52.1.a.(5) and 2.2.52.1.a.(9))                                   |
|                                         |                   | *C | ASW ships may close and carry out one simulated attack without delay, at any range without restriction, before signaling COMEX. (See Article 2.2.51, 2.2.52.1.a.(5) and 2.2.52.1.a.(9))                 |
|                                         |                   | D  | ASW ships may fire light projectiles at dived submarines. (See Article 2.2.52.1.a.(7))                                                                                                                  |
|                                         |                   | *E | ASW ships may fire heavy projectiles, if the submarine is known to be at a safe depth. (See Article 2.2.52.1.a.(7))                                                                                     |
|                                         |                   | *F | ASW ships may fire practice ASW torpedoes or missiles carrying practice ASW torpedoes. (See Article 2.2.52.1.a.(8))                                                                                     |
|                                         |                   | G  | Aircraft may carry out night attacks against submarines, subject to Articles 2.2.52 and 2.2.54.                                                                                                         |
|                                         |                   | *H | Aircraft/Drones may drop practice ASW torpedoes. (See Article 2.2.52.1.b.(7))                                                                                                                           |
|                                         |                   | *J | Submarine is not obliged to go to, or to remain at, Safe Depth after COMEX or GO TIME. (See Articles 2.2.51, 2.2.52.1.a.(5) and 2.2.14)                                                                 |
|                                         |                   | K  | Submarines may fire exercise torpedoes provided the requisite attack signals are displayed by the target ships. (See Article 5.15)                                                                      |
|                                         |                   | L  | Submarines may fire grenades (flares), in addition to red grenades (flares) in an emergency, provided it is assessed that helicopters or fixed wing aircraft will not be endangered.                    |
|                                         |                   | *M | ASW ships may close and carry out any number of simulated attacks at any range without restriction, without delay, and without signaling COMEX. (See Article 2.2.51, 2.2.52.1.a.(5) and 2.2.52.1.a.(9)) |
|                                         |                   | *N | ASW units may conduct a live ordnance attack with (.....) (weapons to be inserted) subject to the specific authorization and limitations as laid down by the national SUBOPAUTH.                        |
| Conduct of Forces at FINEX or STOP TIME | 3                 | A  | Submarines need not return to periscope depth after FINEX. (See Article 2.2.71.2.)                                                                                                                      |

Table 3-2. Relaxation Table (NU)

**Note.**

*Certain Relaxations are marked with an asterisk (\*) and may only be used subject to the prior approval of the Submarine Operating Authority. (See Article 1.30)*

| <b>TOPIC</b>                                     | <b>RELAXATION NUMBER</b> | <b>DEGREE OF RELAXATION PERMITTED</b>                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conduct of Forces at FINEX or STOP TIME (Cont'd) | 3                        | B<br>Submarines are not to come to periscope depth after FINEX and will remain at safe depth until STOP TIME.                                                                                                                                                                                                                    |
|                                                  |                          | C<br>Spare.                                                                                                                                                                                                                                                                                                                      |
|                                                  |                          | D<br>ASW ships may break off attacks before FINEX and continue operations without waiting for the submarine to come to periscope depth.                                                                                                                                                                                          |
|                                                  |                          | *E<br>Submarines may proceed from Safe Depth to periscope depth when in company with surface forces prior to receipt of DDD or the 5-charge signal. (See Articles 2.2.72, 2.2.73 and 2.2.14)                                                                                                                                     |
|                                                  |                          | *F<br>Submarines are allowed to remain submerged and need not return to periscope depth at STOP TIME, provided that UWT communications are established between the submarine and surface units before the latter departs from the scene of action.                                                                               |
|                                                  |                          | *G<br>During the time that the submarine is coming to periscope depth or surfacing, ships may proceed at less than 12 knots but must cavitate.                                                                                                                                                                                   |
|                                                  |                          | *H<br>IAW Articles 2.2.73 or 2.2.74, para 2, submarines are allowed to remain submerged and need not return to periscope depth at STOP TIME (see Article 2.2.71.2). There is no need to communicate and surface forces, without turning to the safety course, are allowed to depart, even before STOP TIME (see article 2.2.75). |
|                                                  |                          | *J<br>Surfacing Method BRAVO is to be used as standard surfacing method. (See Article 2.2.72.1.c. and 2.2.74.)                                                                                                                                                                                                                   |
|                                                  |                          | *K<br>Submarines may proceed from Safe Depth to periscope depth when in company with surface forces at the discretion of the submarine Commanding Officer.                                                                                                                                                                       |
| Contact Investigation                            | 4                        | A<br>Once contact has been made, shadowing submarines may leave their assigned areas and shadow the target, but are not to dive in other submarine areas.                                                                                                                                                                        |
|                                                  |                          | B<br>Spare.                                                                                                                                                                                                                                                                                                                      |
|                                                  |                          | C<br>Spare.                                                                                                                                                                                                                                                                                                                      |
|                                                  |                          | D<br>Spare.                                                                                                                                                                                                                                                                                                                      |
|                                                  |                          | *E<br>ASW ships may investigate contacts by day or night without restriction. (See Articles 2.2.51.1 and 2.2.52.1.a.(9))                                                                                                                                                                                                         |
| Evasive Steering                                 | 5                        | A<br>The Main Body (or Target Submarine in "S" Series CASEXes, Chapter 4) may carry out evasive steering as detailed in Exercise Instructions ordered.                                                                                                                                                                           |
|                                                  |                          | B<br>Individual ships of Main Body may weave.                                                                                                                                                                                                                                                                                    |
|                                                  |                          | C<br>Ships of Main Body are free to avoid torpedoes.                                                                                                                                                                                                                                                                             |

Table 3-2. Relaxation Table (Cont'd) (NU)

| TOPIC                                                   | RELAXATION NUMBER |    | DEGREE OF RELAXATION PERMITTED                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------|-------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Evasive Steering (Cont'd)                               | 5                 | D  | Emergency turns are permitted by day.                                                                                                                                                                                                                                                                             |
|                                                         |                   | E  | Emergency turns are permitted by night.                                                                                                                                                                                                                                                                           |
|                                                         |                   | F  | ASW ships may use evasive steering as desired by day, independently of the force screened.                                                                                                                                                                                                                        |
|                                                         |                   | G  | ASW ships may use evasive steering as desired by night, independently of the force screened.                                                                                                                                                                                                                      |
|                                                         |                   | H  | ASW ships are entirely free to avoid torpedoes.                                                                                                                                                                                                                                                                   |
|                                                         |                   | J  | Evasive steering by surface forces is unrestricted.                                                                                                                                                                                                                                                               |
| Navigation Lights                                       | 6                 | A  | Submarines are not to show any navigation lights by night except for reasons of safety and when surfacing.                                                                                                                                                                                                        |
|                                                         |                   | B  | Submarines need not show navigation lights when surfacing at night.                                                                                                                                                                                                                                               |
|                                                         |                   | C  | Ships of main body are to dim their navigation lights except in situations where their safety is impaired.                                                                                                                                                                                                        |
|                                                         |                   | *D | Ships of main body are <u>not</u> to show navigation lights except in situations where their safety is impaired.                                                                                                                                                                                                  |
|                                                         |                   | E  | ASW ships not towing VDS/DTAS/MTAS are to show only dimmed navigation lights except in situations where their safety is impaired.                                                                                                                                                                                 |
|                                                         |                   | *F | ASW ships not towing VDS/DTAS/MTAS are not to show navigation lights except in situations where their safety is impaired.                                                                                                                                                                                         |
| Surface Ship Propeller Cavitations (See Article 2.2.16) | 7                 | *A | ASW ships may slow below cavitation speed, operate radiated noise masking systems or stop the screws by day. (See Articles 2.2.16, 2.2.73 and 2.2.74)                                                                                                                                                             |
|                                                         |                   | *B | ASW ships may slow below cavitation speed, operate radiated noise masking systems or stop their screws by night. (See Articles 2.2.16, 2.2.73 and 2.2.74)                                                                                                                                                         |
|                                                         |                   | *C | ASW ships may slow below cavitation speed, operate radiated noise masking systems, provided they transmit on sonar. (See Articles 2.2.16, 2.2.73 and 2.2.74)                                                                                                                                                      |
|                                                         |                   | *D | All ships may slow below cavitation speed, operate radiated noise masking systems or stop their screws by day.                                                                                                                                                                                                    |
|                                                         |                   | *E | All ships may slow below cavitation speed, operate radiated noise masking systems or stop their screws by night.                                                                                                                                                                                                  |
|                                                         |                   | *F | All ships may slow below cavitation speed or operate radiated noise masking systems by day or night, without transmitting on sonar, provided they transmit continuously on the lowest frequency echo sounder at maximum power and maintain an alert listening watch on underwater telephone. (See Article 2.2.18) |

Table 3-2. Relaxation Table (Cont'd) (NU)

| TOPIC                                                                                                                                                            | RELAXATION NUMBER | DEGREE OF RELAXATION PERMITTED                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface Ship Propeller Cavitations (Cont'd) (See Article 2.2.16)                                                                                                 | 7                 | *G<br>Ships may slow below cavitation speed or operate noise masking systems by day or night without transmitting on sonar, providing they transmit on UWT, repeating "YANKEE BRAVO CHARLIE" three times every five minutes (see Article 2.2.16).                                                                                                                    |
|                                                                                                                                                                  |                   | *H<br>Ships may slow below cavitation speed or operate noise masking systems by day and/or night without transmitting on sonar providing they transmit on a sequencing UWT (UWT designator from Table 2-6D) at max/min power or ... dB every ... minutes at ... kHz (see Article 2.2.17-4).                                                                          |
| VDS/Towed Array/ Helicopter Dipping Sonar Systems (See Table 2-2 Note 7)<br><br><b>Note.</b><br><i>Units of measurement must be specified in CASEX messages.</i> | 8                 | *A<br>Submarines are to proceed to a safe depth when nearest ship streaming VDS/DTAS/MTAS approaches to within (.....) yards as indicated. (See Article 2.2.36.1.b)                                                                                                                                                                                                  |
|                                                                                                                                                                  |                   | *B<br>Ships may employ VDS/DTAS/MTAS (.....) (Signal Designator from Tables 2-5A, B & C) to cable length (.....) measured in meters (feet) from the water line. (See Article 2.2.36)                                                                                                                                                                                 |
|                                                                                                                                                                  |                   | C<br>Submarines need not proceed to a safe depth when operating with <u>helicopters</u> using active sonar. They must not, however, deliberately approach to within 500 yards of any helicopter in the dip. (see Article 2.2.34)                                                                                                                                     |
|                                                                                                                                                                  |                   | D<br>Helicopters operating in dipping sonar may lower transducers to maximum depth of (.....) meters (feet) as indicated.                                                                                                                                                                                                                                            |
|                                                                                                                                                                  |                   | *E<br>In advanced exercises when VDS/DTAS/MTAS is being employed, <del>submarines</del> need not initiate standard surfacing procedures before proceeding from Safe Depth to periscope depth.                                                                                                                                                                        |
|                                                                                                                                                                  |                   | F<br>Helicopters operating dipping sonar may lower transducers to the best search depth if accurate sonar search, conducted at the start of each dip with the transducer at a depth no greater than (.....) meters (feet), has negative results. Transducers should be raised to the above depth if a contact approaches within 1000 yards.                          |
|                                                                                                                                                                  |                   | *G<br>At FINEX or STOP TIME VDS/DTAS/MTAS cable length must not exceed (.....) meters (feet).                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                  |                   | *H<br>Ships may employ VDS/DTAS/MTAS (.....) (Signal Designator from Tables 2-5A, B and C) to cable length (.....) measured in meters (feet) from the water-line without transmitting on any active sonar, provided they transmit the warning signal "VDS" successively on the VDS and hull sonar UWT, or hull sonar UWT only if not practicable, every two minutes. |
|                                                                                                                                                                  |                   | *J<br>Ships may employ CATAS (.....) (Signal Designator from Table 2-5B and C) without restriction.                                                                                                                                                                                                                                                                  |

Table 3-2. Relaxation Table (Cont'd) (NU)

| TOPIC                                                                                                                                                                                 | RELAXATION NUMBER | DEGREE OF RELAXATION PERMITTED |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------|
| VDS/Towed Array Systems<br><br>(See Table 2-2 Note 7)<br><br><b>Note.</b><br><i>Units of measurement must be specified in CASEX messages.</i><br><br>See Record of Reservations - FRA | 8                 | *K                             |
|                                                                                                                                                                                       |                   | L                              |
|                                                                                                                                                                                       |                   | *M                             |
|                                                                                                                                                                                       |                   | *N                             |
|                                                                                                                                                                                       |                   | *P                             |
|                                                                                                                                                                                       |                   | *Q                             |
|                                                                                                                                                                                       |                   | *R                             |
| Towed Decoys<br>(See Table 2-2, Note 7)                                                                                                                                               | 9                 | *A                             |
|                                                                                                                                                                                       |                   | B                              |
|                                                                                                                                                                                       |                   | *C                             |
|                                                                                                                                                                                       |                   | D                              |
|                                                                                                                                                                                       |                   | *E                             |
|                                                                                                                                                                                       |                   | *F                             |

Table 3-2. Relaxation Table (Cont'd) (NU)

| TOPIC                                                                                                                                                | RELAXATION NUMBER |    | DEGREE OF RELAXATION PERMITTED                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Signal Charges                                                                                                                                       | 10                | *A | Ships and Aircraft may drop X and Y rated explosive charges within 1000 yards of the estimated position of a submarine (see Article 2.2.39, Table 2-7 and Article 5.11.1)                                                |
|                                                                                                                                                      |                   | *B | Ships and aircraft may drop Z-rated explosive charges (____) (line number from Table 2-6) OUTSIDE (____) (range in yards) of the estimated position of a submarine. (See Article 2.2.39 and Table 2-7.)                  |
| Aircraft Height Separations                                                                                                                          | 11                | A  | Subject to approval of Scene-of-Action Commander and appropriate Air Commander, fixed-wing aircraft cooperating with helicopters are allowed to descend to any altitude to carry out ASW action. (See Article 2.2.31.2.) |
| Submarine Safety Separations (See Articles 2.2.12 and 2.2.14)<br><br><b>Note.</b><br><i>Units of measurement must be specified in CASEX messages</i> | 12                | *A | Submarine height (base of keel to top of fin) (.....) meters (feet).                                                                                                                                                     |
|                                                                                                                                                      |                   | *B | Draft of surface ships may be assumed to be (.....) meters (feet). (See important Note 2 to Table 2-2.)                                                                                                                  |
|                                                                                                                                                      |                   | *C | Upper vertical safety separation is reduced to those figures shown in Column D, sub-columns Y of Table 2-2 or to (.....) meters (feet) for speeds as indicated.                                                          |
|                                                                                                                                                      |                   | *D | Bottom vertical safety separation is reduced to those figures shown in Column F, sub-column Y of Table 2-2 or to (.....) meters (feet) for speeds as indicated.                                                          |
|                                                                                                                                                      |                   | *E | Lower vertical safety separation is reduced to those figures shown in Column H, sub-column Y of Table 2-2 or to (.....) meters (feet) for speeds as indicated.                                                           |
|                                                                                                                                                      |                   | *F | Submarines may bottom. (See Article 2.2.14)                                                                                                                                                                              |
|                                                                                                                                                      |                   | *G | Horizontal separation towards the limit of the submarines area is modified to (.....) miles. (see Article 2.2.12.1).                                                                                                     |

Table 3-2. Relaxation Table (Cont'd) (NU)

| TOPIC                                                          | RELAXATION NUMBER | DEGREE OF RELAXATION PERMITTED                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental Restrictions (See Article 2.2.14)                | 13                | *A<br>If the visibility through the periscope by day or night is reduced to 2000 yards, submarines equipped with surface warning radar, which is working efficiently, may dive.                                                                                                                                                                              |
|                                                                |                   | *B<br>Submarines equipped with surface warning radar, which is working efficiently, may dive under all conditions of periscope visibility, day or night.                                                                                                                                                                                                     |
|                                                                |                   | *C<br>Submarines not equipped with surface warning radar, or submarines which have defective surface warning radar, may dive under all conditions of periscope visibility, day or night.                                                                                                                                                                     |
| Neutral Corridors (See Article 2.2.37 and Figures 2-2 and 2-3) | 14                | *A<br>The exercise may be extended beyond 2 hours. It will include (.....) runs of 2 hours or (.....) hours. The neutral corridor must be re-established after each run.                                                                                                                                                                                     |
|                                                                |                   | *B<br>The duration of the exercise will be 4 or (.....) hours. The width of the neutral corridor will be extended to 8000 yards at GO TIME plus 2 or (.....) hours.                                                                                                                                                                                          |
|                                                                |                   | *C<br>The neutral corridor consists of two right-angle corridors. The zone reserved for the submarine is quadrant (.....).                                                                                                                                                                                                                                   |
|                                                                |                   | *D<br>The neutral corridor at GO TIME is defined in relation to a line bearing (....) (from visible landmark).                                                                                                                                                                                                                                               |
|                                                                |                   | *E<br>The neutral corridor at GO TIME is reduced to 2000 yards.<br><b>Note.</b><br><i>This Relaxation should not be ordered at the same time as Relaxation 14*B.</i>                                                                                                                                                                                         |
| Towed/Dipping Sonar in Exercise Stovepipe                      | 15                | *A<br>Helicopters may operate dipping sonars in Exercise Stovepipe/Skylight.                                                                                                                                                                                                                                                                                 |
|                                                                |                   | *B<br>Helicopters may operate dipping sonars in Exercise Stovepipe/Skylight provided they transmit continuously on active sonar.                                                                                                                                                                                                                             |
|                                                                |                   | *C<br>Ships not deploying towed bodies, VDS/DTAS/MTAS may enter an Exercise Stovepipe/Skylight.                                                                                                                                                                                                                                                              |
|                                                                |                   | *D<br>Ships not deploying towed bodies, VDS/DTAS/MTAS may enter an Exercise Stovepipe/Skylight, providing they steer a direct course through the Exercise Stovepipe/Skylight and are cavitating.                                                                                                                                                             |
|                                                                |                   | *E<br>Ships not deploying towed bodies, VDS/DTAS/MTAS may enter an Exercise Stovepipe/Skylight provided they transmit continuously on active sonar within (.....) yards (normally 3000 yards) from the outer edge and within all of the Exercise Stovepipe/Skylight. Ships may not approach a sonar contact closer than (.....) yards (normally 4000 yards). |
|                                                                |                   | *F<br>Ships deploying CATAS (....) (signal from Table 2-5B and C) may enter an Exercise Stovepipe/Skylight provided they cavitate or transmit on active sonar or UWT or other acoustic warning system.                                                                                                                                                       |

Table 3-2. Relaxation Table (Cont'd) (NU)

| <b>TOPIC</b>                              | <b>RELAXATION NUMBER</b> | <b>DEGREE OF RELAXATION PERMITTED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Towed/Dipping Sonar in Exercise Stovepipe | 15                       | *G<br>Ships deploying CATAS (....) (signal designator from Table 2-5B and C) may enter an Exercise Stovepipe/Skylight provided they steer a direct course through the Exercise Stovepipe/Skylight and cavitate or transmit on active sonar or UWT or other acoustic warning system.                                                                                                                                                                                                                                                                         |
|                                           |                          | *H<br>Ships deploying VDS/DTAS/MTAS (....)(signal designator from Tables 2-5A, B and C) may enter an Exercise Stovepipe/Skylight provided they steer a direct course through the Exercise Stovepipe/Skylight and transmit continuously on active sonar within (.....) yards (normally 3000 yards) from the outer edge and within all of the Exercise Stovepipe/Skylight or if Relaxation 8*H is in force, cavitate and use the signals described in Relaxation 8*H. Ships may not approach a sonar contact closer than (.....) yards (normally 4000 yards). |
| Counter-Attacks                           | 20                       | A<br>OPFOR submarines may counter attack.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Depth (see Articles 2.2.13 and 4.22)      | 21                       | A<br>FRNFOR submarines may be at periscope depth at night from (....) to (....). OPFOR submarines must be in their deep depth zone between these times.                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                           |                          | B<br>OPFOR submarines may be at periscope depth at night from (....) to (....). FRNFOR submarines must be in their deep depth zone between these times.                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                           |                          | *C<br>FRNFOR submarines may come to periscope depth while in the Safety Zone/Safety Circle to identify HE, provided they return to minimum safe depth within 5 minutes after arrival at periscope depth.                                                                                                                                                                                                                                                                                                                                                    |
|                                           |                          | *D<br>FRNFOR submarines have freedom in depth until HE has been firmly established, where after they are to go to safe depth or to (....) meters (feet).                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                           |                          | *E<br>Submarines can be at periscope depth when this depth zone is assigned to another submarine (but cannot remain there for more than ..... minutes). (see Articles 4.26 and 4.32).                                                                                                                                                                                                                                                                                                                                                                       |
|                                           |                          | *F<br>Submarines are allowed to change depth through depth zone(s) allocated to other submarines. (see Article 4.32).                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                           |                          | *G<br>Submarines changing depth to PD through depth zone(s) allocated to other submarines may clear baffles in this depth zone, but cannot remain there for more than (.... minutes). (see Article 4.32 and Table 4-1).                                                                                                                                                                                                                                                                                                                                     |

Table 3-2. Relaxation Table (Cont'd) (NU)

| TOPIC                             | RELAXATION NUMBER |    | DEGREE OF RELAXATION PERMITTED                                                                                                                                                                                                                                                                                                  |
|-----------------------------------|-------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Snorkeling                        | 22                | A  | FRNFOR submarines may snorkel from (.....) to (.....).                                                                                                                                                                                                                                                                          |
|                                   |                   | B  | OPFOR submarines may snorkel from (.....) to (.....).                                                                                                                                                                                                                                                                           |
|                                   |                   | *C | Submarines may snorkel at all times.                                                                                                                                                                                                                                                                                            |
| Safety line (see Article 4.15)    | 23                | A  | Safety line will be (.....) yards from the initial position of the attacking submarine.                                                                                                                                                                                                                                         |
| Safety Circles (See Article 4.14) | 24                | *A | Radii of the Inner and Outer Safety Circles are (.....) and (.....) yards, respectively.                                                                                                                                                                                                                                        |
|                                   |                   | *B | Radius of the Special Safety Circle in CASEX S4 is (.....) yards.                                                                                                                                                                                                                                                               |
|                                   |                   | *C | Radius of special Safety Circle around bottomed submarine in CASEX E-6 is (.....) yards.                                                                                                                                                                                                                                        |
| Too Close (See Article 4.17)      | 25                | *A | Submarines are too close when range is less than 1000 yards and the distance off the track is less than 600 yards.                                                                                                                                                                                                              |
| Submarines and Fishing Vessels    | 26                | *A | Ships need not inform submarines of the presence of fishing vessels (see Articles 2.1.13 and 2.1.14).                                                                                                                                                                                                                           |
|                                   |                   | *B | Fishing vessels not engaged in fishing activities are not to be treated as fishing vessels according to Article 2.1.13.                                                                                                                                                                                                         |
|                                   |                   | *C | Remain at least (.....) yards clear of fishing vessels that are engaged in fishing. To assist submarines in identifying fishing vessels, and maintaining the separation distances, ships are to inform submarines whenever a fishing vessel engaged in fishing approaches within (.....) yards of suspected submarine position. |
|                                   |                   | *D | Avoidance of fishing vessels is at CO discretion.                                                                                                                                                                                                                                                                               |

Table 3-2. Relaxation Table (Cont'd) (NU)

| <b>TO SUBMARINES</b> |                                                                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EI NO</b>         | <b>MEANING</b>                                                                                                                                        |
| 100                  | Are to be marked throughout the exercise as follows: by day, by towing marker floats, by night, by burning navigation and/or specialty marker lights. |
| 101                  | Dive (.....) minutes after detecting aircraft radar transmission, and start snorkeling.                                                               |
| 102                  | Are not to dive until aircraft are sighted visually.                                                                                                  |
| 103                  | Are not to dive until attacked by aircraft.                                                                                                           |
| 104                  | Remain within (.....) yards of the diving position for (.....) minutes after COMEX.                                                                   |
| 105                  | Remain within (.....) degree sector, centre bearing (.....) from diving position.                                                                     |
| 106                  | Subject to any safety requirements, are to operate at the depth most favourable to ASW units.                                                         |
| 106A                 | Remain at (.....) meters (feet).                                                                                                                      |
| 107                  | Is not to go below (.....) meters (feet) unless safety requires.                                                                                      |
| 108                  | Hover at (.....) meters (feet).                                                                                                                       |
| 109                  | Are to stay deep for a maximum of (.....) minutes each (.....) hour(s).                                                                               |
| 110                  | Are to surface (.....) minutes after diving.                                                                                                          |
| 111                  | Are to surface at specified times to expose themselves to the aircraft.                                                                               |
| 112                  | Remain within (.....) thousands of yards of start position until COMEX.                                                                               |
| 113                  | Maintain a course (.....) for (.....) minutes after COMEX.                                                                                            |
| 114                  | Is to snorkel or remain at periscope depth in initial position.                                                                                       |
| 115                  | At GO TIME, is to be within (.....) miles from Start Position.                                                                                        |
| 116                  | Are to station themselves (.....) miles apart.                                                                                                        |
| 117                  | Are to station themselves at (.....) mile intervals along the FRNFOR Force route.                                                                     |
| 118                  | Is to steer Safety Course except during ASW action.                                                                                                   |
| 119                  | Limit speed to (.....) knots for (.....) minutes after COMEX.                                                                                         |
| 120                  | Speeds are not to exceed (.....) knots.                                                                                                               |
| 121                  | Comply with course and speed diagrams (.....).                                                                                                        |
| 122                  | Remain within range of the aircraft sonobuoy pattern for (.....) minutes.                                                                             |
| 123                  | Do not react to aircraft detections.                                                                                                                  |
| 124                  | Do not react until ESM warning of radar is (.....) % higher than the Normal Danger level.                                                             |

Table 3-3. Exercise Instruction Table (NU)

| <b>TO SUBMARINES</b> |                                                                                                                              |
|----------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>EI NO</b>         | <b>MEANING</b>                                                                                                               |
| 125                  | Snorkel until sighting aircraft.                                                                                             |
| 126                  | Snorkel until attacked by aircraft.                                                                                          |
| 127                  | Attempt to snorkel for (.....) % of exercise. However, they should avoid detection by aircraft.                              |
| 128                  | Is to have (.....) % battery endurance remaining on completion of transit.                                                   |
| 129                  | Snorkel from (.....) until (.....).                                                                                          |
| 130                  | Make frequent changes in engine revolutions.                                                                                 |
| 131                  | When ordered, stop diesel engines and start them again a few minutes afterwards.                                             |
| 132                  | While snorkeling, proceed at the quietest speed.                                                                             |
| 133                  | Is to ensure periods of high speed snorkel.                                                                                  |
| 134                  | Are to snorkel at various courses and speeds or on (.....) course and (.....) speed.                                         |
| 135                  | Provide visual and acoustic detection opportunities for (.....) % of time.                                                   |
| 136                  | Cavitate for (.....) % of time.                                                                                              |
| 137                  | Cavitate for (.....) minutes after COMEX.                                                                                    |
| 138                  | Are to press home attack on force screened and, if undetected, may surface when the force is out of sight, if safe to do so. |
| 139                  | Priority of the target for attack is:<br><br>(a) Screening units.<br>(b) Screened units.<br>(c) Surface unit designated.     |
| 140                  | Is to indicate attack by releasing a green flare. (Relaxation 2L must be in force.)                                          |
| 141                  | Submarines are to simulate attacks and counter-attacks as opportunity occurs.                                                |
| 142                  | Is to mark simulated attacks by UWT or SST without firing green grenades.                                                    |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| <b>TO SUBMARINES</b> |                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EI NO</b>         | <b>MEANING</b>                                                                                                                                                                                                                                                                                                                                                                                    |
| 143                  | Is to obtain attack data by means of:<br><br>(a) Periscope.<br>(b) Radar.<br>(c) Active Sonar.                                                                                                                                                                                                                                                                                                    |
| 144                  | While conducting attacks, obtain fire control data by making frequent transmissions on radar.                                                                                                                                                                                                                                                                                                     |
| 145                  | Make anti D/F sweeps with search radar at intervals of (.....) minutes, from (.....) until (.....).                                                                                                                                                                                                                                                                                               |
| 146                  | Make frequent periscope radar transmissions on each ship and/or aircraft in turn, from (.....) until (.....).                                                                                                                                                                                                                                                                                     |
| 147                  | Transmit continuously on search radar from (.....) until (.....).                                                                                                                                                                                                                                                                                                                                 |
| 148                  | May use SST or UWT for their own communications.                                                                                                                                                                                                                                                                                                                                                  |
| 149                  | Evasion:<br><br>(a) No evasion.<br>(b) 30° from base course, 2 knots ordered speed, no change in depth.<br>(c) 60° from base course, 4 knots ordered speed, no change in depth.<br>(d) 90° from base course, unlimited speed, 15-metre (50-foot) change in depth.<br>(e) Depth. Evasion between safe depth and maximum permissible operating depth.<br>(f) Unlimited evasion in course and speed. |
| 150                  | May use decoys or evasive devices.                                                                                                                                                                                                                                                                                                                                                                |
| 151                  | Are to use decoys or evasive devices.                                                                                                                                                                                                                                                                                                                                                             |
| 152                  | Are to station themselves to ensure that forces gain contact.                                                                                                                                                                                                                                                                                                                                     |
| 153                  | If not detected within (.....) hours, provoke contact.                                                                                                                                                                                                                                                                                                                                            |
| 154                  | Provoke attacks by ASW units.                                                                                                                                                                                                                                                                                                                                                                     |
| 155                  | Steer towards ASW units if it is considered that contact has been lost for more than (.....) minutes.                                                                                                                                                                                                                                                                                             |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| TO SUBMARINES |                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EI NO         | MEANING                                                                                                                                                                                                                                       |
| 156           | Are to assist relocation after (.....) minutes following last attack signal, when it is considered that contact has been lost, by:<br><br>(a) Smoke.<br>(b) Pyrotechnic.<br>(c) UWT or SST.<br>(d) Bubbles.<br>(e) Underwater vertical light. |
| 157           | Simulated guided missile fire by:<br><br>(a) Surfacing for 5 minutes.<br>(b) Transmitting continuously on X-band radar on firing bearing for five minutes.<br>(c) Firing two yellow submarine pyrotechnics.                                   |
| 158           | Are not deliberately to close within 1000 yards of medium range sonar-fitted helicopters.                                                                                                                                                     |
| 159<br>(NMM)  | NOT RELEASABLE.                                                                                                                                                                                                                               |
| 160           | FRNFOR submarines are to be "Marked" (see Article 4.11.1).                                                                                                                                                                                    |
| 161           | OPFOR submarines are to be "Marked" (see Article 4.11.1).                                                                                                                                                                                     |
| 162           | Maximum speed for submarines at periscope depth is 10 knots.                                                                                                                                                                                  |
| 163           | Target submarine is to steer a straight course.                                                                                                                                                                                               |
| 164           | Target submarine is allowed to zig.                                                                                                                                                                                                           |
| 165           | Release one (color) pyrotechnic signal when at Safe Depth and ready to COMEX. (This instruction may only be ordered with the prior approval of the Submarine Operating Authority (SUBOPAUTH).)                                                |
| 166           |                                                                                                                                                                                                                                               |
| 167           | Submarines use underwater vertical safety light for 1 minute after ASW attack.                                                                                                                                                                |
| 168           | Submarine is to commence evasive maneuvers when active sonobuoys or attack signals are heard.                                                                                                                                                 |
| 169           | Before diving, are to transmit a short drill message on ..... KHz.                                                                                                                                                                            |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| <b>TO SUBMARINES</b> |                                                                                                                                                                                                                                                                                          |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EI NO</b>         | <b>MEANING</b>                                                                                                                                                                                                                                                                           |
| 170                  | Are to conduct ..... all-round sweeps with radar at random intervals (or at intervals of ..... minutes).                                                                                                                                                                                 |
| 171                  | After the exercise are to report to the OCE details of electronic transmissions, i.e.<br><br>(a) Radar transmission times and durations;<br>(b) Times at which surface ships or helicopters were detected, giving bearings and ranges in yards; and<br>(c) Times of radio transmissions. |
| 172                  | On receipt of the first (.....) attack signals by Mk 84 ESUS (Code 1, Table 5-5), submarines are to mark their position by firing a white/yellow smoke.                                                                                                                                  |
| 173<br>to<br>199     | } Spares                                                                                                                                                                                                                                                                                 |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| TO MAIN BODY/FORCE SCREENED/TARGETS |                                                                                                                                 |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| EI NO.                              | MEANING                                                                                                                         |
| 200                                 | Make one zig of not more than 30° during the run.                                                                               |
| 201                                 | Make alterations of course not more than 30° at intervals of not less than five minutes.                                        |
| 202                                 | Carry out one alteration of course not more than 30° by turning together.                                                       |
| 203                                 | May carry out one or more navigational alterations of course by wheeling at intervals of not less than 10 minutes.              |
| 204                                 | Is to zigzag, ships turning together. Alterations of course are not to exceed 30° and at intervals of not less than 10 minutes. |
| 205                                 | May use any zigzag plan.<br>(NMM) NOT RELEASABLE.                                                                               |
| 206                                 | Target ships are to zigzag independently.                                                                                       |
| 207                                 | Target ships are to carry out independent narrow weave.                                                                         |
| 208                                 | Free to carry out any of the evasive tactics previously mentioned.                                                              |
| 209                                 | May make alterations of speed.                                                                                                  |
| 210                                 | Use speeds up to and including 10 knots.                                                                                        |
| 211                                 | Use speeds up to and including 18 knots.                                                                                        |
| 212                                 | Speeds in excess of 18 knots may be used.                                                                                       |
| 213                                 | } Spares                                                                                                                        |
| 214                                 |                                                                                                                                 |
| 215                                 | Screened ships may attack submarines subject to Relaxations in effect.                                                          |
| 216                                 | Screened ships shall not attack submarines.                                                                                     |
| 217                                 | } Spares                                                                                                                        |
| 218                                 |                                                                                                                                 |
| 219                                 |                                                                                                                                 |
| 220                                 | Maintain radar policy:<br><br>(a) Silence.<br>(b) Intermittent.<br>(c) (.....).                                                 |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| <b>TO MAIN BODY/FORCE SCREENED/TARGETS</b> |                                                                                                                                        |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>EI NO.</b>                              | <b>MEANING</b>                                                                                                                         |
| 221                                        | Maintain Sonar Policy:<br><br>(a) Continuous active.<br>(b) Intermittent.<br>(c) HE listening.                                         |
| 222                                        | Maintain decoy (noisemaker) policy:<br><br>(a) Silence.<br>(b) Intermittent.<br>(c) Continuous.                                        |
| 223                                        | Follow a course that will bring ships to a point more than (.....) nautical miles from the starting position of the submarine.         |
| 224                                        | At the beginning of the pass, ships are to be at a point more than (.....) nautical miles from the starting position of the submarine. |
| 225                                        | Follow a course that will bring ships within (.....) miles of the starting position of the submarine.                                  |
| 226                                        | Target ships with screen to pass within (.....) yards of submarine position or centre of submarine area.                               |
| 227                                        | Target ships open to (.....) miles on completion of each run.                                                                          |
| 228                                        | Is to coast-crawl (that is, target ships follow the line of the coast as closely as safe navigation permits).                          |
| 229                                        | Main body to be formed by (.....) (time).                                                                                              |
| 230                                        | Main body may be simulated.                                                                                                            |
| 231                                        | Make initial contact reports to (.....) and amplifying reports, including classification, to (.....).                                  |
| 232                                        | (NMM) NOT RELEASABLE.                                                                                                                  |
| 233<br>to<br>299                           | } Spares                                                                                                                               |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| <b>TO ESCORTS/SCREENING SHIPS</b> |                                                                                                          |
|-----------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>EI NO.</b>                     | <b>MEANING</b>                                                                                           |
| 300                               | Are to use any zigzag plan independently of the force being screened.<br><b>(NMM) NOT RELEASABLE.</b>    |
| 301                               | Use a simple zigzag independently.                                                                       |
| 302                               | Are to weave independently.                                                                              |
| 303                               | Are to carry out independent narrow weave.                                                               |
| 304                               | Spare                                                                                                    |
| 305                               | Ships are not to alter more than 120° from the MLA/Base course to carry out urgent attacks.              |
| 306                               | Free to carry out any of the above manoeuvres.                                                           |
| 307                               | Alterations of course are not to exceed 30° at intervals of not less than five minutes.                  |
| 308                               | Conform to the limitations imposed on the target information.                                            |
| 309                               | Are to patrol within 400 yards of station (narrow weave) up to four knots in excess of base speed.       |
| 310                               | Are to patrol within 2000 yards of station (broad weave) up to eight knots in excess of base speed.      |
| 311                               | Maintain radar policy:<br><br>(a) Silence.<br><br>(b) Intermittent.<br><br>(c) (.....).                  |
| 312                               | Maintain decoy (noise maker) policy:<br><br>(a) Silence.<br><br>(b) Intermittent.<br><br>(c) Continuous. |
| 313                               | Maintain sonar policy:<br><br>(a) Continuous active.<br><br>(b) Intermittent.<br><br>(c) HE listening.   |
| 314                               | Are not to transmit on long and medium range sonar before GO TIME.                                       |
| 315                               | Conduct sonar deception procedures.                                                                      |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| <b>TO ESCORTS/SCREENING SHIPS</b> |                                                                                                          |
|-----------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>EI NO.</b>                     | <b>MEANING</b>                                                                                           |
| 316                               | Maximum duration of unsuccessful investigations (.....) minutes.                                         |
| 317                               | Make initial contact reports to (.....) and amplifying reports including classification to (.....).      |
| 318                               | May illuminate contact by (.....) e.g., Searchlight/Starshell).                                          |
| 319                               | Practice lost contact procedure.                                                                         |
| 320                               | Conduct ASW action while under air attack.                                                               |
| 321                               | Conduct ASW action in a Nuclear Fallout area.                                                            |
| 322                               | Cruising watches are to practice ASW action.                                                             |
| 323                               | May use Signal A2 in marking attacks.                                                                    |
| 324                               | Conduct attacks at silent speed. (Applicable Relaxations 7* <u>must</u> be in force.)                    |
| 325                               | Screening ship shall not attack submarine.                                                               |
| 326                               | Screening ships may attack submarine subject to Relaxations in force.                                    |
| 327                               | Only one attack is to be carried out.                                                                    |
| 328                               | After (.....) attacks, ASW units withdraw to (.....) miles for (.....) minutes and then return to datum. |
| 329                               | Practice "Stand Off" attacks without closing the target.                                                 |
| 330<br>(NMM)                      | NOT RELEASABLE.                                                                                          |
| 331<br>to<br>399                  | } Spares                                                                                                 |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| <b>TO FIXED-WING AIRCRAFT</b> |                                                                                                                |
|-------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>EI NO.</b>                 | <b>MEANING</b>                                                                                                 |
| 400                           | Dive submarine when at (.....) miles.                                                                          |
| 401                           | May carry out simulated attacks subject to provisions in Article 2.2.50.                                       |
| 402                           | Maximum duration of unsuccessful investigations (.....) minutes.                                               |
| 403                           | Withdraw outside visual range of submarine.                                                                    |
| 404                           | Carry out GAMBIT tactics.                                                                                      |
| 405                           | Practice ON TOP procedures.                                                                                    |
| 406                           | Open and close submarine's position. (Pro Sub.)                                                                |
| 407                           | Distance from co-operating ships to be (.....) miles at GO TIME or at (.....).                                 |
| 408                           | Distance from submarine to be (.....) miles at GO TIME or at (.....).                                          |
| 409                           | Make initial contact reports to (.....), and amplifying reports, including contact classification, to (.....). |
| 410<br>(NMM)                  | NOT RELEASABLE.                                                                                                |
| 411                           | Conduct only passive localization and tracking (until .....).                                                  |
| 412                           | First attack is to be based on passive sensor information.                                                     |
| 413<br>to<br>499              | } Spares                                                                                                       |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

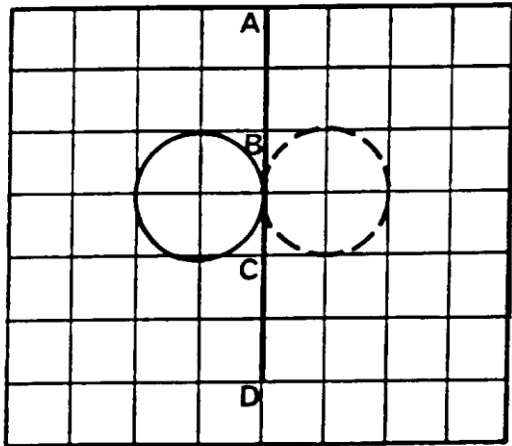
| TO HELICOPTERS   |                                                                                                                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EI NO.           | MEANING                                                                                                                                                                                                                                                                                                          |
| 500              | Maintain sonar contact on the submarine at GO TIME.                                                                                                                                                                                                                                                              |
| 501              | At GO TIME, one helicopter is to orbit the submarine and the others to orbit between 5 and 10 miles away.                                                                                                                                                                                                        |
| 502              | At GO TIME, helicopters remain outside 5 miles from the submarine.                                                                                                                                                                                                                                               |
| 503              | At GO TIME, all helicopters are to be at least 3 times TSR from submarine.                                                                                                                                                                                                                                       |
| 504              | Start exercise using <u>Method One</u> . At GO TIME, helicopters are at immediate readiness and are scrambled so as to join the fixed-wing aircraft at datum at GO TIME plus (.....) minutes.                                                                                                                    |
| 505              | Start exercise using <u>Method Two</u> . Helicopters join the ASW ships at GO TIME plus 20 minutes and search with them, being detached so as to join the fixed-wing aircraft at datum at GO TIME plus (.....) minutes.                                                                                          |
| 506              | Start exercise using <u>Method Three</u> . Helicopters join the ASW ships at GO TIME plus 20 minutes and are sent to investigate a false datum. Subsequently, they are ordered to proceed direct from the false datum so as to join the fixed-wing aircraft at the actual datum at GO TIME plus (.....) minutes. |
| 507              | Dive submarine when at (.....) miles.                                                                                                                                                                                                                                                                            |
| 508              | May simulate attack subject to provisions of Article 2.2.50.                                                                                                                                                                                                                                                     |
| 509              | Track the submarine and home the ASW ships to the datum in conjunction with the fixed-wing aircraft, which will act as a radio link and carry out ON TOP procedures.                                                                                                                                             |
| 510              | Assist surface ships in close ASW action in accordance with current doctrine.                                                                                                                                                                                                                                    |
| 511              | Make initial contact reports to (....) and amplifying reports, including classification, to (...).                                                                                                                                                                                                               |
| 512              | Maximum duration of unsuccessful investigations (.....) minutes.                                                                                                                                                                                                                                                 |
| 513              | Medium-range sonar-fitted helicopters are not deliberately to dip or remain in the dip within 1000 yards of a submarine.                                                                                                                                                                                         |
| 514<br>(NMM)     | NOT RELEASABLE.                                                                                                                                                                                                                                                                                                  |
| 515              | Helicopters may lower transducers to the maximum depth allowed in the exercise orders only when accurate sonar search, with the transducer at a depth of 15 metres (50 feet), has been completed with negative results (see Article 2.2.34).                                                                     |
| 516<br>to<br>599 | } Spares                                                                                                                                                                                                                                                                                                         |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

| TO ALL PARTICIPANTS |                                                                                                                                                                                                                                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EI NO.              | MEANING                                                                                                                                                                                                                          |
| 600                 | Time of Order to Dive is time of COMEX.                                                                                                                                                                                          |
| 601                 | Exercise terminates at FINEX.                                                                                                                                                                                                    |
| 602                 | Termination of exercise will be ordered by:<br><br>(a) OTC<br><br>(b) OCE<br><br>(c) OSE<br><br>(d) OCS                                                                                                                          |
| 603                 | Practice weapon firing phase:<br><br>(a) Submarine from (.....) to (.....).<br><br>(b) ASW ships from (.....) to (.....).<br><br>(c) Fixed wing aircraft from (.....) to (.....).<br><br>(d) Helicopter from (.....) to (.....). |
| 604                 | Make attack reports in accordance with current doctrine.                                                                                                                                                                         |
| 605                 | Make occasional transmission on radar and/or radio as opportunity permits.                                                                                                                                                       |
| 606                 | Recovery vessel takes station (.....) miles from submarine.                                                                                                                                                                      |
| 607                 | Carry out EWX (.....) from (.....).                                                                                                                                                                                              |
| 608<br>(NMM)        | NOT RELEASABLE.                                                                                                                                                                                                                  |
| 609                 | Designated sonobuoys are not to be dropped in Exercise Stovepipe/Skylight.                                                                                                                                                       |
| 610<br>to<br>699    | } Spares                                                                                                                                                                                                                         |

Table 3-3. Exercise Instruction Table (Cont'd) (NU)

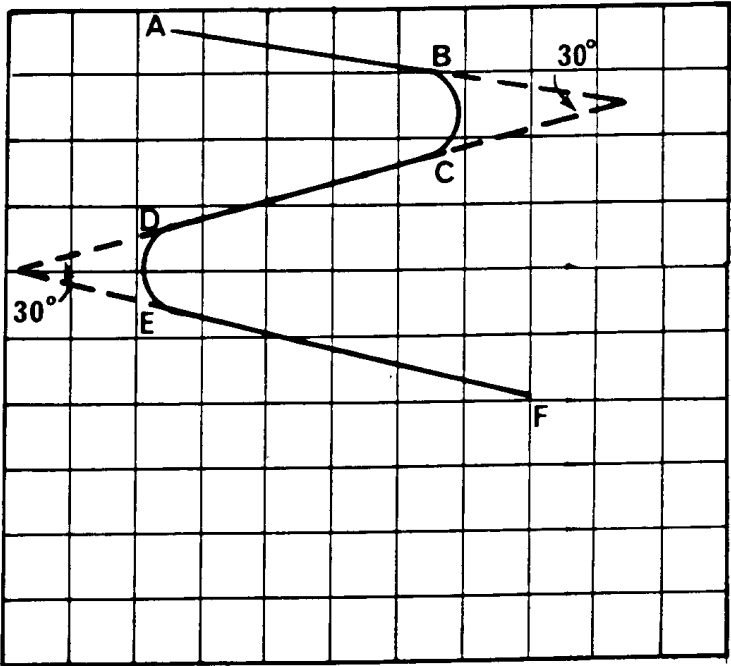
Diagram No. 32



| Leg | Time<br>(mins) | Speed<br>(kts) |
|-----|----------------|----------------|
| A-B | 30             | 10-15          |
| B-C | 20             | 5-7            |
| C-D | 30             | 10-15          |

Table 3-4. Submarine Course and Speed Diagrams (NU)

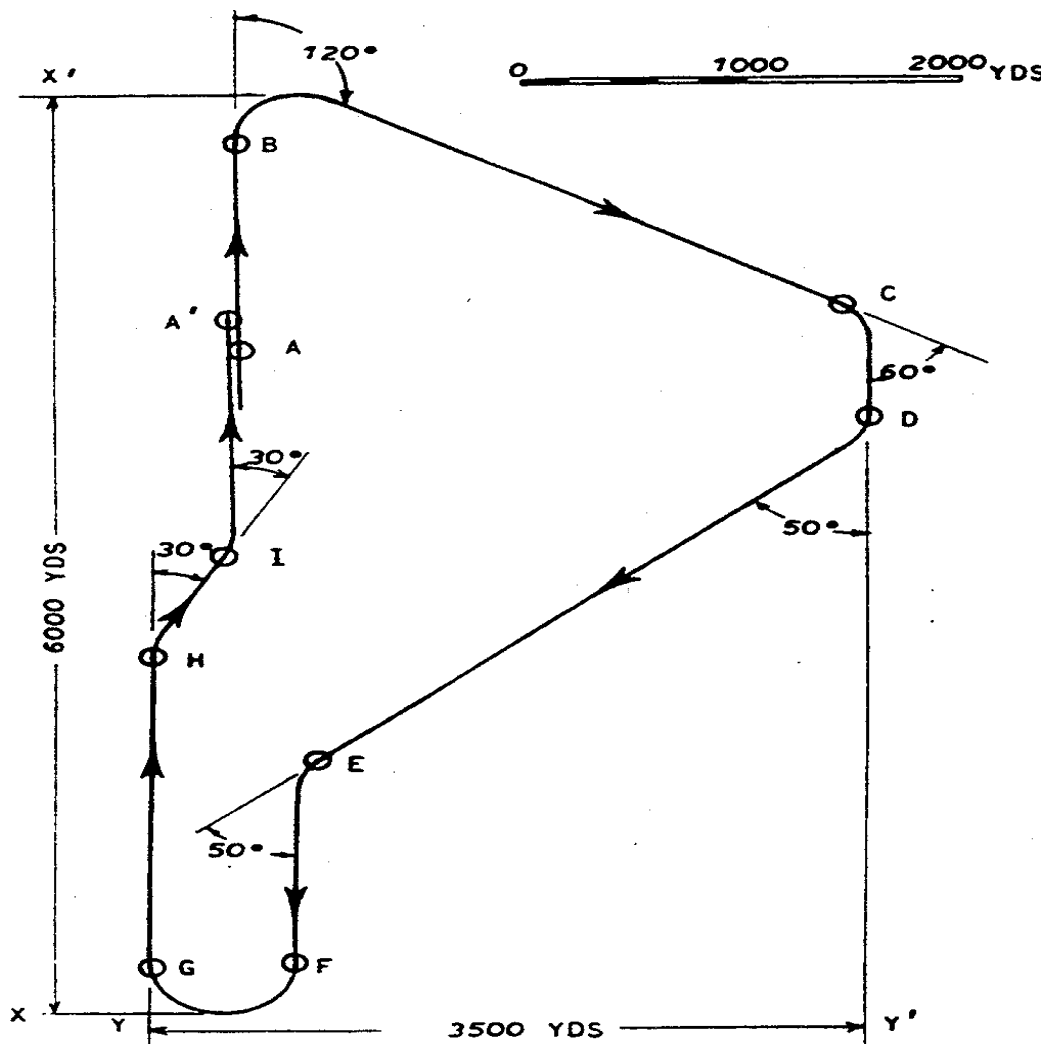
Diagram No. 33



| Leg | Time<br>(mins) | Speed<br>(kts) |
|-----|----------------|----------------|
| A-B | 30             | 8-10           |
| B-C | 15             | 5-7            |
| C-D | 30             | 8-10           |
| D-E | 15             | 5-7            |
| E-F | 30             | 8-10           |

Table 3-4. Submarine Course and Speed Diagrams (Cont'd) (NU)

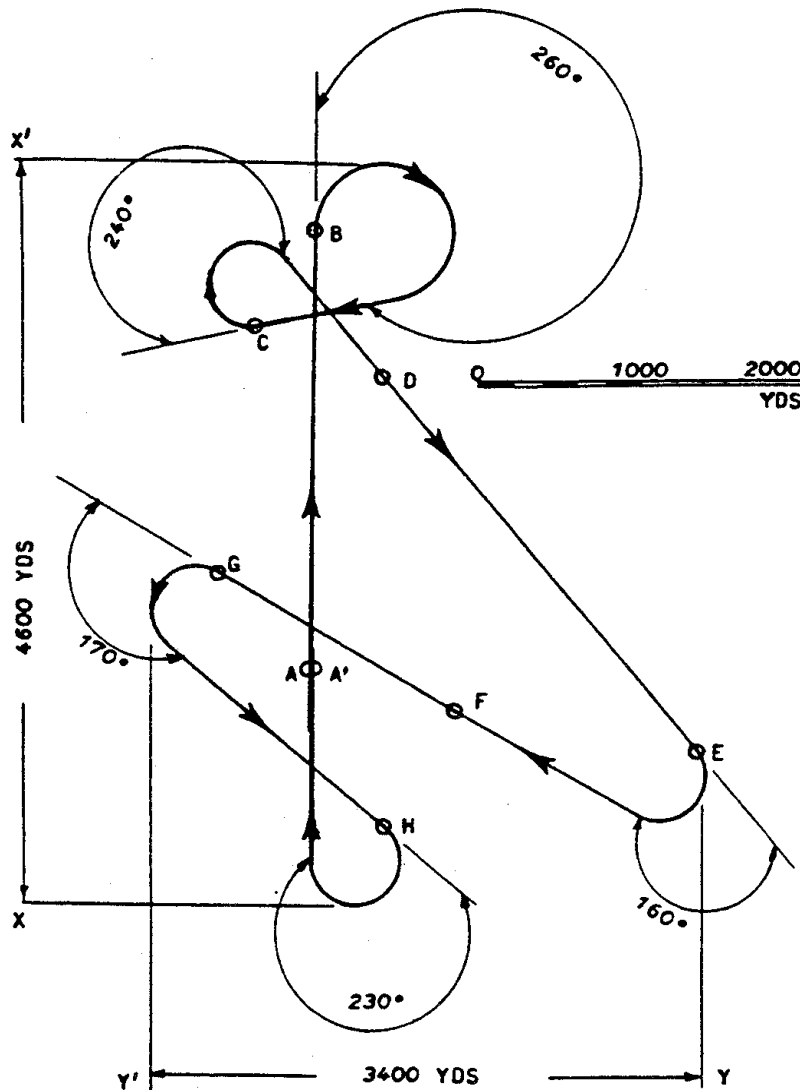
Diagram No. 41



| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 13          | 3           | 1358           | A                  | 0    |
| BC  | 24          | 4           | 3243           | B                  | +13  |
| CD  | 11          | 2           | 743            | C                  | +37  |
| DE  | 20          | 5           | 3378           | D                  | +48  |
| EF  | 10          | 4           | 1351           | E                  | +68  |
| FG  | 7           | 4           | 946            | F                  | +78  |
| GH  | 10          | 6           | 2027           | G                  | +85  |
| HI  | 10          | 2           | 675            | H                  | +95  |
| IA' | 15          | 3           | 1518           | I                  | +105 |
|     |             |             |                | A'                 | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

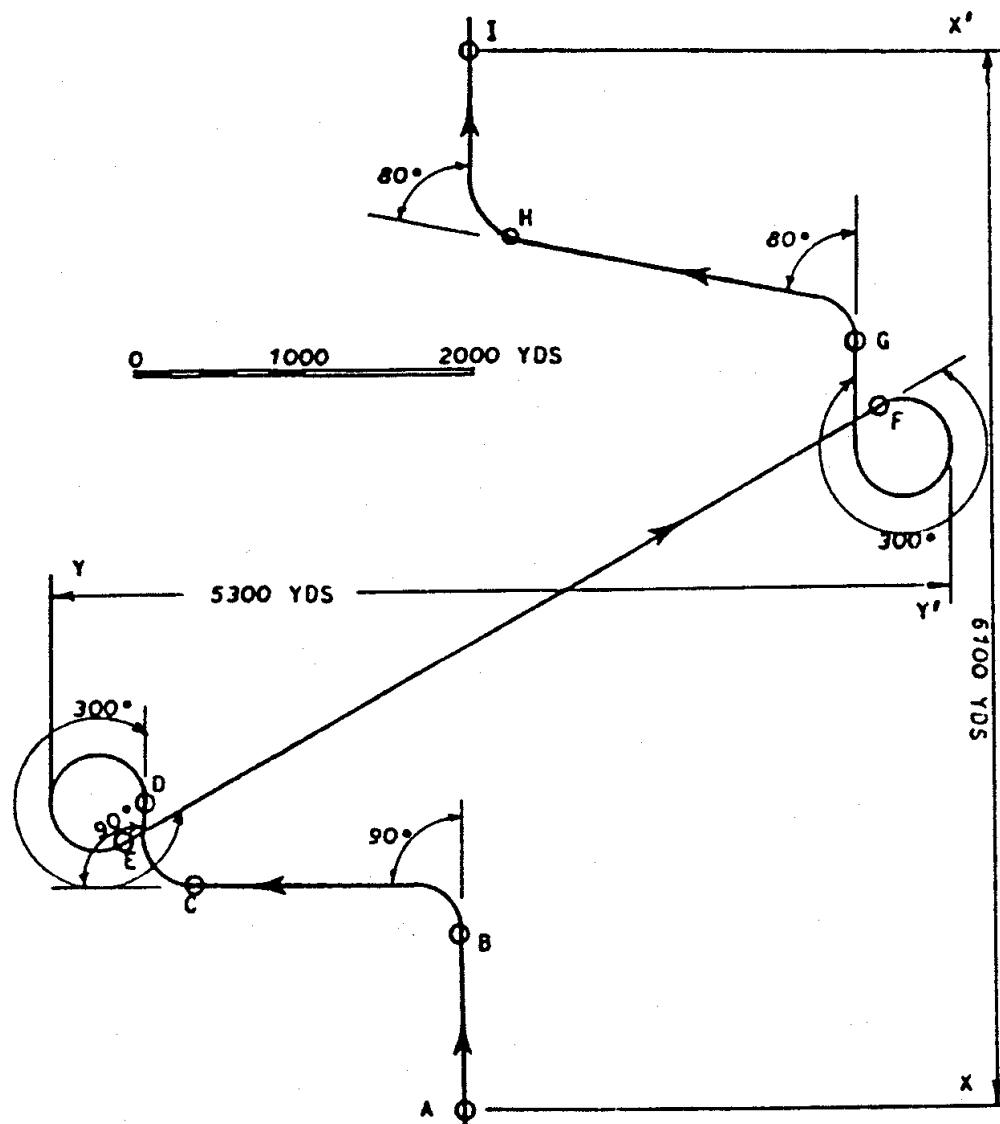
Diagram No. 42



| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 20          | 4           | 2702           | A                  | 0    |
| BC  | 17          | 5           | 2871           | B                  | +20  |
| CD  | 20          | 3           | 2027           | C                  | +37  |
| DE  | 15          | 6           | 3040           | D                  | +57  |
| EF  | 15          | 4           | 2027           | E                  | +72  |
| FG  | 10          | 5           | 1689           | F                  | +87  |
| GH  | 10          | 7.5         | 2534           | G                  | +97  |
| HA' | 13          | 5           | 2196           | H                  | +107 |
|     |             |             |                | A'                 | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

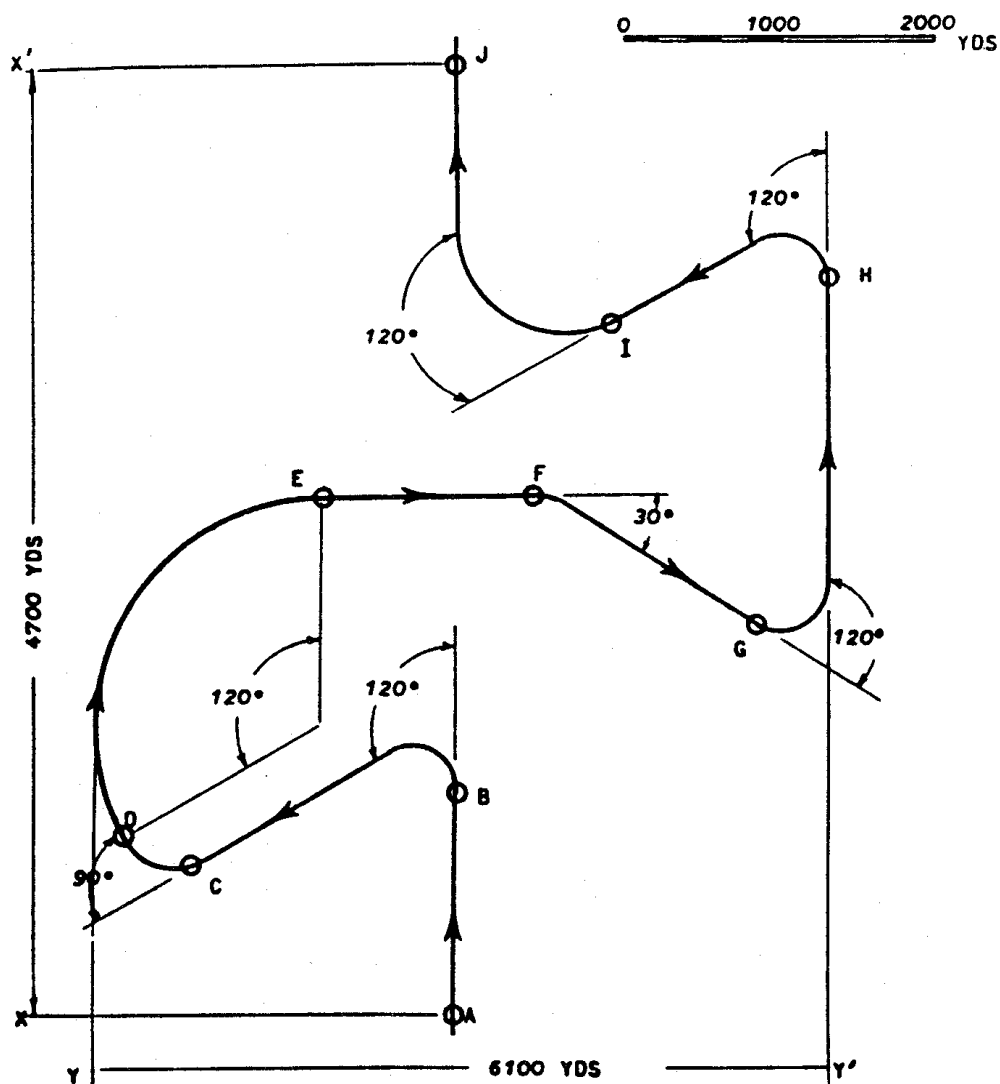
Diagram No. 43



| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 15          | 2           | 1013           | A                  | 0    |
| BC  | 10          | 5           | 1689           | B                  | +15  |
| CD  | 10          | 2           | 597            | C                  | +25  |
| DE  | 20          | 2           | 1430           | D                  | +35  |
| EF  | 25          | 6           | 5067           | E                  | +55  |
| FG  | 15          | 4           | 2027           | F                  | +80  |
| GH  | 13          | 5           | 2218           | G                  | +95  |
| HI  | 12          | 3           | 1216           | H                  | +108 |
|     |             |             |                | I                  | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

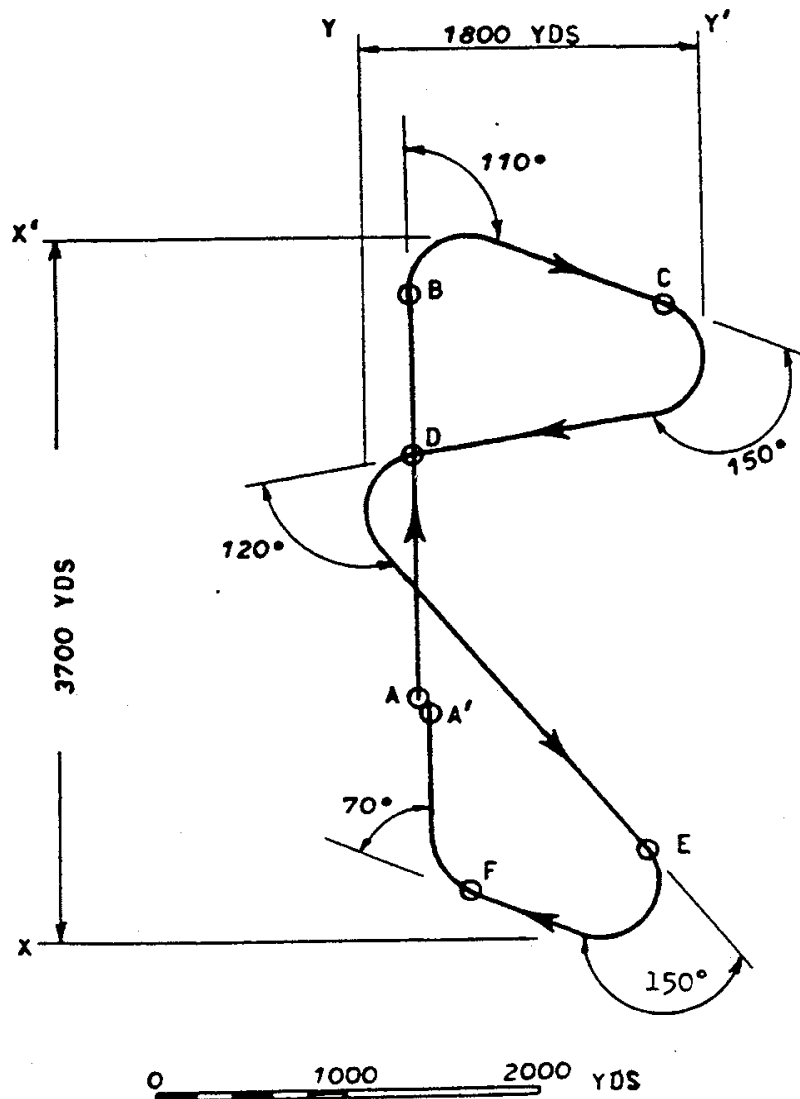
Diagram No. 44



| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 14          | 3           | 1419           | A                  | 0    |
| BC  | 10          | 6           | 2027           | B                  | +14  |
| CD  | 5           | 3           | 507            | C                  | +24  |
| DE  | 30          | 3           | 3040           | D                  | +29  |
| EF  | 10          | 4           | 1351           | E                  | +59  |
| FG  | 10          | 5           | 1689           | F                  | +69  |
| GH  | 10          | 7.5         | 2534           | G                  | +79  |
| HI  | 10          | 5           | 1689           | H                  | +89  |
| IJ  | 21          | 3.5         | 2483           | I                  | +99  |
|     |             |             |                | J                  | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

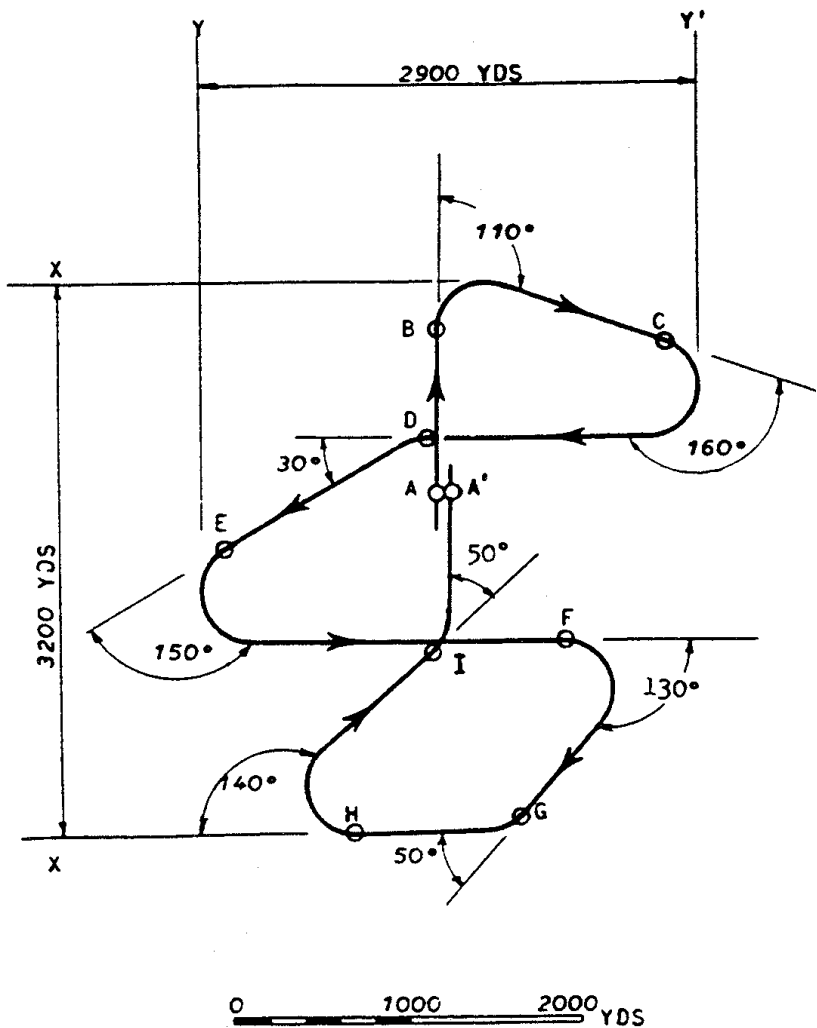
Diagram No. 51



| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 18          | 3.5         | 2128           | A                  | 0    |
| BC  | 15          | 3           | 1520           | B                  | +18  |
| CD  | 30          | 2           | 2027           | C                  | +33  |
| DE  | 20          | 4           | 2702           | D                  | +63  |
| EF  | 27          | 1.5         | 1368           | E                  | +83  |
| FA' | 10          | 3           | 1013           | F                  | +110 |
|     |             |             |                | A'                 | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

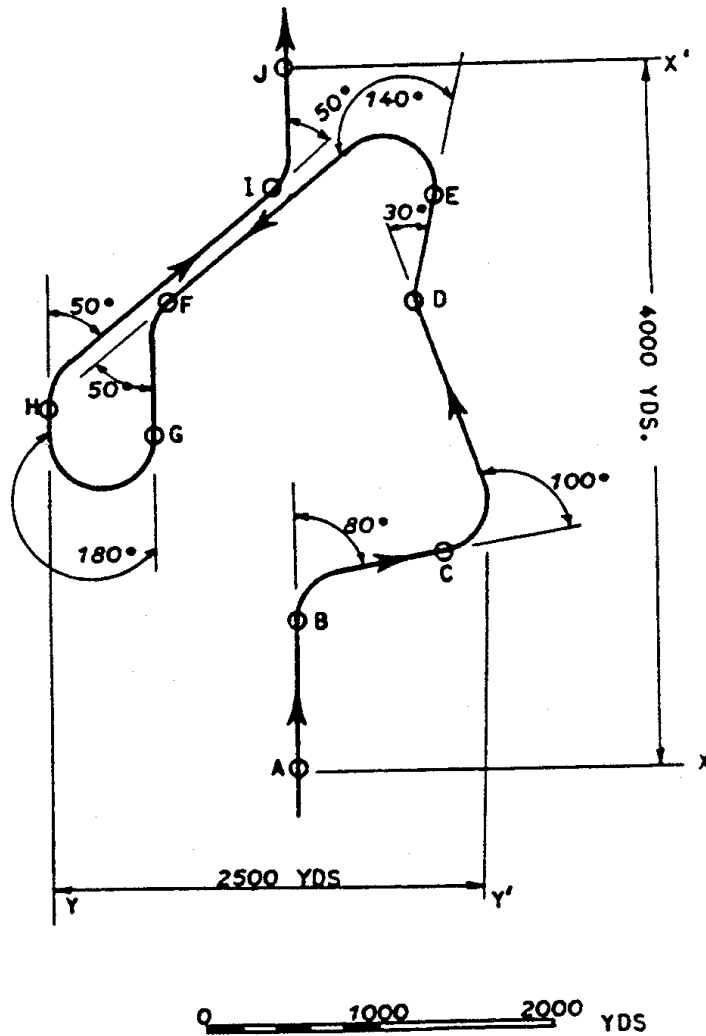
Diagram No. 52



| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 8           | 3.5         | 946            | A                  | 0    |
| BC  | 15          | 3           | 1520           | B                  | +8   |
| CD  | 15          | 4           | 2027           | C                  | +23  |
| DE  | 10          | 4           | 1351           | D                  | +38  |
| EF  | 15          | 5           | 2534           | E                  | +48  |
| FG  | 20          | 2           | 1351           | F                  | +63  |
| GH  | 10          | 3           | 1013           | G                  | +83  |
| HI  | 18          | 2.5         | 1520           | H                  | +93  |
| IA' | 9           | 3           | 912            | I                  | +111 |
|     |             |             |                | A                  | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

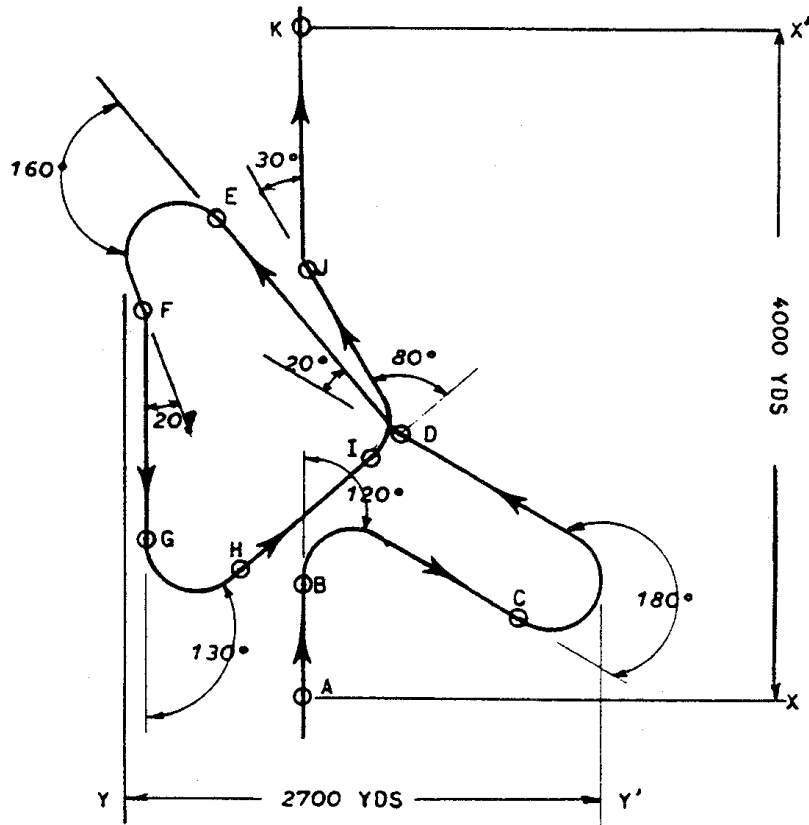
Diagram No. 53



| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 10          | 2.5         | 844            | A                  | 0    |
| BC  | 15          | 2           | 1013           | B                  | +10  |
| CD  | 15          | 3           | 1520           | C                  | +25  |
| DE  | 10          | 2           | 676            | D                  | +40  |
| EF  | 15          | 4           | 2027           | E                  | +50  |
| FG  | 15          | 1.5         | 760            | F                  | +65  |
| GH  | 10          | 3           | 1013           | G                  | +80  |
| HI  | 21          | 2.5         | 1774           | H                  | +90  |
| IJ  | 19          | 2.5         | 760            | I                  | +111 |
|     |             |             |                | J                  | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

Diagram No. 54



0 1000 2000 YDS

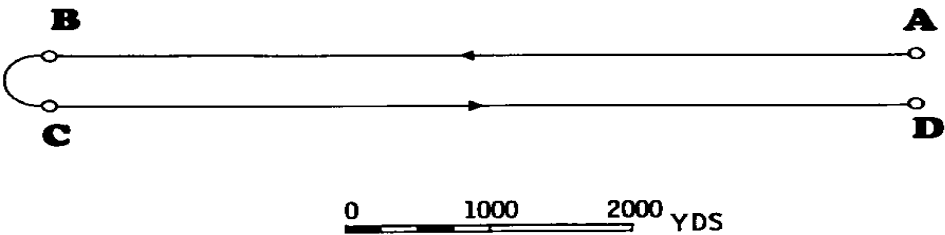
| Leg | Time (mins) | Speed (kts) | Distance (yds) | Time at Each Point |      |
|-----|-------------|-------------|----------------|--------------------|------|
| AB  | 8           | 2.5         | 676            | A                  | 0    |
| BC  | 15          | 3           | 1520           | B                  | +8   |
| CD  | 15          | 4           | 2027           | C                  | +23  |
| DE  | 10          | 5           | 1689           | D                  | +38  |
| EF  | 15          | 2           | 1013           | E                  | +48  |
| FG  | 10          | 4           | 1352           | F                  | +63  |
| GH  | 10          | 2           | 676            | G                  | +73  |
| HI  | 10          | 3           | 1013           | H                  | +83  |
| IJ  | 15          | 2.5         | 1267           | I                  | +93  |
| JK  | 12          | 3.5         | 1419           | J                  | +108 |
|     |             |             |                | K                  | +120 |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)



Table 3-4 Submarine Speed and Course Diagrams (Cont'd) (NU)

Diagram 56



| Leg | Speed (kts) | Distance (yds) |
|-----|-------------|----------------|
| AB  | 6           | 6000           |
| BC  | 6           | Turn 180°      |
| CD  | 6           | 6000           |

Table 3-4. Submarine Speed and Course Diagrams (Cont'd) (NU)

| <b>CASEX NO.</b> | <b>PURPOSE</b>                                                                            | <b>RECOMMENDED DURATION</b> |
|------------------|-------------------------------------------------------------------------------------------|-----------------------------|
| A-1              | Basic Tracking Exercise                                                                   | 1-1/2 hrs                   |
| A-2              | Basic Coordinated Tracking Exercise                                                       | 2 hrs                       |
| A-3              | Basic SAU Exercise                                                                        | 2 hrs                       |
| A-4              | Advanced SAU Exercise                                                                     | 2-1/2 hrs                   |
| A-5              | Basic Submarine Attack on a Screened or Unscreened Target - Counter Attack not Allowed    | 3 hrs                       |
| A-6              | Intermediate Submarine Attack on a Screened or Unscreened Target - Counter Attack Allowed | 3-1/2 hrs                   |
| A-7              | (NMM) NOT RELEASABLE.                                                                     |                             |
| A-8              | Defence of an Open Anchorage or Assault Area                                              | 5 hrs                       |
| A-9              | VDS Tracking Exercise Using Safety Zone Separation                                        | 2 hrs                       |
| A-10             | VDS Tracking Exercise Using a Submarine Area and Safety Zone                              |                             |
| A-11             | Sonar Passive Tracking                                                                    |                             |
| A-12             | Sonar Passive Tracking (multi-ship)                                                       |                             |
| A-13             | Passive Tracking Exercise                                                                 |                             |
| A-14 to A-20     | Spares                                                                                    |                             |
| A-21             | Basic Passive Tracking Exercise                                                           |                             |
| A-22             | Long-Range Passive Detection and Localization Exercise                                    |                             |
| A-23             | (NMM) NOT RELEASABLE.                                                                     |                             |
| A-24             | Intermediate ASW Area Search                                                              |                             |

Table 3-5. CASEX A Series – Exercises Involving Ships and/or Helicopters (NU)

| <b>CASEX NO.</b> | <b>PURPOSE</b>                                            | <b>RECOMMENDED DURATION</b> |
|------------------|-----------------------------------------------------------|-----------------------------|
| B-1              | Basic Search, Homing and Attack Exercise                  | 2 hrs                       |
| B-2              | Basic Localization and Attack Exercise                    | 2 hrs                       |
| B-3              | Advanced Search, Localization and Attack Exercise         | 4 hrs                       |
| B-4              | Basic ASW Barrier Exercise                                | 12 hrs                      |
| B-5              | Advanced ASW Barrier Exercise                             | At least 24 hrs             |
| B-6              | Basic Passive Tracking and Attack Exercise                | 4 hrs                       |
| B-7              | Defence of a Coastal Area by MPA Against Submarine in MIO | 3 to 5 hrs                  |

Table 3-6. CASEX B Series – Exercises Involving ASW Aircraft (NU)

| <b>CASEX NO.</b> | <b>PURPOSE</b>                                                                      | <b>RECOMMENDED DURATION</b> |
|------------------|-------------------------------------------------------------------------------------|-----------------------------|
| C-1              | (NMM) NOT RELEASABLE.                                                               |                             |
| C-2              | Basic Coordinated ASW Exercise                                                      | 3 hrs                       |
| C-3              | Advanced Coordinated ASW Exercise                                                   | 3 hrs or more               |
| C-4              | Advanced Coordinated ASW Exercise/ Protection of a Force                            | 12 hrs or more              |
| C-5              | Advanced Coordinated ASW Exercise Against Transiting/Patrolling Submarines          | 12 hrs or more              |
| C-6              | VDS Exercise Use Safety Zone Separation                                             | 2 hrs                       |
| C-7              | Defence of Main Body During Opposed Sortie/ Entry                                   | 3 hrs or more               |
| C-8              | (NMM) NOT RELEASABLE.                                                               |                             |
| C-9              | ASW Forces Area Search Followed by Submarine Attack on Underway Replenishment Group | 5 hours or more             |
| C-10             | Coordinated Passive Tracking Exercise by TAS Units and Aircraft                     |                             |
| C-11             | Intermediate Coordinated ASW Area Search                                            |                             |
| C-12             | Advanced Coordinated ASW Exercise (PROWLEX)                                         |                             |

Table 3-7. CASEX C Series – Exercises Involving Multiple Forces (NU)

| CASEX NO. | PURPOSE              | RECOMMENDED DURATION |
|-----------|----------------------|----------------------|
| D-1       | (NMM) NOT RELEASABLE |                      |
| D-2       | (NMM) NOT RELEASABLE |                      |
| D-3       | (NMM) NOT RELEASABLE |                      |
| D-4       | (NMM) NOT RELEASABLE |                      |

Table 3-8. (NC) (NMM) NOT RELEASABLE.

| CASEX NO. | PURPOSE                                                            | RECOMMENDED DURATION |
|-----------|--------------------------------------------------------------------|----------------------|
| E-1       | Familiarization Submarine and ASW Units Exercise                   | As specified         |
| E-2       | (NMM) NOT RELEASABLE                                               |                      |
| E-3       | Mutual Sensor Exercise                                             | 1 hr                 |
| E-4       | ASW Action Against a Bottomed Submarine or Target                  | 2 hrs                |
| E-5       | Exercise in Searching for a Simulated Submarine Casualty (SMASHEX) | 3 hrs                |
| E-6       | CASEX E-6 is promulgated in ATP/MTP-57 (C ) Chapter 7              |                      |
| E-7       | Underwater Look Exercise                                           | 2 hrs or more        |
| E-8       | Depth Charge Exercise                                              | As specified         |
| E-9       | CASEX E-9 is promulgated in ATP/MTP-57 (C ) Chapter 7              |                      |

Table 3-9. CASEX E Series – Exercises of a Miscellaneous Nature (NU)

| CASEX NO | PURPOSE                                                                                          | RECOMMENDED DURATION |
|----------|--------------------------------------------------------------------------------------------------|----------------------|
| F-1      | Train basic ASW procedures (SAU procedures and close ASW action) when no submarine is available. | 3 hrs                |
| F-2      | To exercise advanced ASW procedures when no submarine is available                               | 3 hrs                |

Table 3-10. CASEX F Series – Synthetic Exercises (NU)

**INTENTIONALLY BLANK**

## CASEX A-1

### BASIC TRACKING EXERCISE

#### (NU) PURPOSE

To exercise one ASW ship and/or helicopter in basic submarine tracking and attacking.

#### (NU) FORCES REQUIRED

1. One ship and/or helicopter.
2. One submarine.

#### (NU) SITUATION

1. Submarine is on the surface or at PD with the ship and/or helicopter within 4000 yards, or helicopter and submarine are in visual contact.
2. Submarine is to dive to a Safe Depth,
3. Initially, submarine course, speed and depth are to be restricted.

#### (NU) PROCEDURE

1. Establish communications prior to GO TIME.
2. Units station themselves in accordance with Article 2.2.60.
3. Submarine reports "Ready".
4. ASW Unit orders submarine to dive.
5. Submarine reports when at Safe Depth by UWT or SST.
6. ASW Unit initiates COMEX.
7. Carry out ASW action.
8. Unit breaks off attacks five minutes before FINEX.
9. At FINEX, submarine is to return to PD and establish comms in accordance with Article 2.2.73 (Method Alfa) or 2.2.74 (Method Bravo - 3\*J) unless relaxations in force otherwise permit.

#### (NU) SPECIAL PROVISIONS

None.

**(NU) RECORDS**

As required.

## CASEX A-2

### BASIC COORDINATED TRACKING EXERCISE

#### (NU) PURPOSE

1. To exercise two or more ASW units in:
  - a. Tracking and attacking a submarine.
  - b. Inter-unit plotting and reporting procedures.
2. To exercise a submarine in counter-attacking and evading.

#### (NU) FORCES REQUIRED

1. Two or more ASW ships and/or helicopters.
2. One submarine.

#### (NU) SITUATION

1. Submarine is on the surface or at PD with the ships and/or helicopters within 4000 yards, and is required to dive to a Safe Depth; and/or
2. Helicopters and submarine are in visual and voice contact. Submarine may be on the surface or at PD.
3. Initially, submarine course, speed and depth are restricted.

#### (NU) PROCEDURE

1. Establish communications prior to GO TIME.
2. Units station themselves in accordance with Article 2.2.60.
3. Submarine reports "Ready".
4. OTC/OCS orders submarine to dive or go to Safe Depth.
5. Submarine reports when at Safe Depth by UWT or SST.
6. OTC/OCS initiates COMEX.
7. Carry out ASW action.
8. Units break off attacks five minutes before FINEX.

9. At FINEX submarine is to return to PD and establish comms in accordance with Article 2.2.73 (Method Alfa) or 2.2.74 (Method Bravo - 3\*J) unless relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

None.

## **(NU) RECORDS**

As required.

**CASEX A-3**

**BASIC SAU EXERCISE**

**(NU) PURPOSE**

1. To exercise two or more ASW units in:
  - a. Detecting, classifying, tracking and attacking a submarine.
  - b. Simple SAU procedure.
  - c. Inter-unit reporting, plotting and control procedures.
2. To exercise a submarine in counter-attacking and evading after detection.

**(NU) FORCES REQUIRED**

1. Two or more ASW units.
2. One submarine.

**(NU) SITUATION**

1. Submarine to remain within 2000 yards of start position until COMEX, unless otherwise directed.
2. Submarine is required to go to a Safe Depth when threatened by ASW ships or helicopters.
3. After COMEX the submarine may be restricted or unrestricted.
4. Start position for ASW units to be 10-15 miles (or as desired) from submarine's start position.

**(NU) PROCEDURE**

1. Units close estimated position of submarine.
2. Submarine goes to Safe Depth in accordance with the Safety Precautions and the relaxations in force.
3. If the submarine is prematurely forced deep it may return to PD, when safe to do so, provided COMEX has not been initiated.
4. First unit gaining contact initiates COMEX.
5. Carry out ASW action (see Article 2.2.52. (1).a.).

6. Submarine remains at Safe Depth until FINEX or STOP TIME, depending on relaxations in force.
7. Units break off attacks five minutes before FINEX.
8. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73, unless relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

None.

## **(NU) RECORDS**

As required.

**CASEX A-4**

**ADVANCED SAU EXERCISE**

**(NU) PURPOSE**

1. To exercise two or more ASW units in:
  - a. Detecting, classifying, tracking and attacking a submarine;
  - b. Advanced SAU procedures; and
  - c. Inter-unit plotting, reporting and control procedures.
2. To exercise submarines in counter-attacking and avoiding detection.

**(NU) FORCES REQUIRED**

1. Two or more ASW units.
2. One submarine.

**(NU) SITUATION**

1. Submarine is to remain within specified Submarine Probability Area until COMEX, then it is unrestricted.
2. ASW units are to be 15-20 miles (or as desired) from the centre of the Submarine Probability Area.

**(NU) PROCEDURE**

1. Units close estimated position of submarine.
2. Submarine is to attempt to avoid detection while within the Submarine Probability Area.
3. Submarine goes to Safe Depth in accordance with the Safety Precautions and the relaxations in force.
4. If the submarine is prematurely forced deep, it may return to PD when safe to do so, provided COMEX has not been initiated.
5. First unit gaining contact initiates COMEX.
6. Carry out ASW action (see Article 2.2.52.(1).a.).

7. Submarine remains at Safe Depth until FINEX or STOP TIME depending on relaxations in force.
8. Units break off attacks 5 minutes before FINEX. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73 unless relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

None.

## **(NU) RECORDS**

As required.

## CASEX A-5

### BASIC SUBMARINE ATTACK ON A SCREENED OR UNSCREENED TARGET (COUNTER-ATTACK NOT ALLOWED)

#### (NU) PURPOSE

1. To exercise submarines in simulated or practice torpedo attacks on screened or unscreened targets and escorts.
2. To exercise ASW units in detecting submarines attacking or penetrating a screen.
3. To exercise ASW units in the detection of torpedoes and the employment of torpedo countermeasures.

#### (NU) FORCES REQUIRED

1. One or more ships and, if available, helicopters.
2. One or more submarines.

#### (NU) SITUATION

1. Surface units steer a base course and speed to pass known submarine start position as ordered.
2. As the attack proficiency of the submarine improves, the surface units may be allowed to employ countermeasures as authorized by the relaxations and Exercise Instructions in force.
3. Submarine may be at any depth in start position.
4. Distance between submarines and surface units for each run, is to be specified by the OCS.

#### (NU) PROCEDURE

1. Units close position of submarine.
2. Submarine makes approach and attack.
3. Submarine goes to Safe Depth in accordance with the safety Precautions and the relaxations in force.
4. If the submarine is prematurely forced deep, it may return to PD, when safe to do so.

5. If ASW units gain contact, they are not to drop back, alter course to investigate, attack or counter-attack, or initiate COMEX.
6. Submarine attacks should be signaled.
7. Exercise terminates at STOP TIME, or for individual submarines when they surface, whichever is earlier. (Surfacing procedure in accordance with Article 2.2.73 is to be carried out at STOP TIME unless all submarines have by then surfaced, or unless relaxations in force permit otherwise.)

## **(NU) SPECIAL PROVISIONS**

1. When practice torpedo firings have been authorized, the following provisions apply:
  - a. Normally, only one run will be allowed.
  - b. OCS may specify a minimum torpedo firing range to obtain maximum value in torpedo detection.
  - c. Surface ships are not to evade torpedoes, unless the appropriate relaxations are in force.
  - d. (NMM) NOT RELEASABLE.

## **(NU) RECORDS**

As required.

## CASEX A-6

### INTERMEDIATE SUBMARINE ATTACK IN A SCREENED OR UNSCREENED TARGET (COUNTER-ATTACK ALLOWED)

#### (NU) PURPOSE

1. To exercise submarines in attacking an unscreened or screened target and evading detection.
2. To exercise units in detecting, attacking and/or counter-attacking submarines.

#### (NU) FORCES REQUIRED

1. One or more ships, and, if available, helicopters.
2. One or more submarines.

#### (NU) SITUATION

1. Surface units steer a base course to pass within 6000 yards, or as specified by the OCE/OCS, of the initial position of the submarine or centre of the area, employing countermeasures authorized by Relaxations and Exercise Instructions.
2. Submarines are to avoid detection and achieve a firing position.
3. The initial distance between surface units and submarines will be at least 15 miles or as specified by the OCE/OCS.

#### (NU) PROCEDURE

1. Units close estimated position of submarine.
2. Submarine makes approach and attacks.
3. Submarine may remain at PD or go to Safe Depth in accordance with the safety precautions and relaxations in force.
4. The first unit gaining contact initiated COMEX.
5. Carry out ASW action (see Article 2.2.52.(1).a.).
6. Submarine attacks may be signaled.
7. Submarine may remain at Safe Depth or RTPD to counter-attack until FINEX or STOP TIME, depending on relaxations in force.
8. Units break off attacks five minutes before FINEX.

9. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73 unless relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

1. If more than one submarine is to participate, they are to be stationed at least 5 miles apart, unless coordinated attacks are allowed.
2. Practice torpedoes may be fired during the exercise until COMEX plus five minutes.

## **(NU) RECORDS**

As required.

**CASEX A-7**

**(NMM) NOT RELEASABLE**

**INTENTIONALLY BLANK**

## CASEX A-8

### DEFENCE OF AN OPEN ANCHORAGE OR ASSAULT AREA

#### (NU) PURPOSE

1. To exercise ASW units in protecting an exposed anchorage or assault area.
2. To exercise submarines in penetrating a patrol of ASW units and attacking a concentration of shipping.
3. To exercise participants in conducting inshore operations.

#### (NU) FORCES REQUIRED

1. Two or more target ships, or a reference ship.
2. Two or more ASW ships and/or helicopters.
3. One or more submarines.

#### (NU) SITUATION

1. ASW units defend the designated area while submarines endeavour to penetrate the ASW patrol and attack shipping or the reference ship.
2. Target ships or reference ship may be at anchor or underway.

#### (NU) PROCEDURE

1. The OSE/OCE designates the area and establishes patrols.
2. At GO TIME, or as ordered, the submarine is to dive, remaining in assigned approach sector, and is to try to penetrate the ASW defence.
3. ASW units defend the area as ordered.
4. Submarines which penetrate the patrol are to indicate simulated torpedo attacks by the appropriate signals, and avoid detection.
5. First unit gaining contact initiates COMEX.
6. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73, unless relaxations in force otherwise permit.

#### (NU) SPECIAL PROVISIONS

# NATO UNCLASSIFIED

**MXP-01**

1. Submarines are to be informed of the limits of the approach sector and may be given information on the type of patrol used by the ASW units.
2. If more than one submarine take part, the senior submarine commanding officer is to coordinate attacks.
3. (NMM) NOT RELEASABLE.

## **(NU) RECORDS**

As required.

**CASEX A-9**

**VDS/MTAS TRACKING EXERCISE USING SAFETY ZONE  
SEPARATION**

**(NU) PURPOSE**

1. To exercise ASW ships and helicopters in detecting and counter-attacking an attacking submarine.
2. To exercise VDS/MTAS ships in basic submarine tracking.

**(NU) FORCE REQUIRED**

1. One or more ASW ships and/or helicopters, with at least one VDS/MTAS ship.
2. One submarine.

**(NU) SITUATION**

1. Submarine is on the surface or at PD at GO TIME.
2. The OCS is in visual contact and within 5 miles of the submarine. The Relaxation 14\*D (Table 3-2) allows the exercise to start when the participating units are not in visual contact.

**(NU) PROCEDURE**

1. OCS orders all ASW units and submarines to lock plots at GO TIME. The Safety Zone (see Special Provisions) is marked on the plots of submarine and all ships.
2. The submarine, after initial locking of the Safety Zone, dives and maneuvers so as to remain within the Submarine Area.
3. Ships open out in the VDS/MTAS area, outside the Safety Zone. VDS/MTAS may be streamed providing the submarine is on the surface, or streamed in the VDS/MTAS area after the Safety Zone has been locked and the submarine has dived. VDS/MTAS ships then maneuver as required to detect and track the submarine, remaining outside the Safety Zone. Other units close the position of the submarine as directed by the OCS.
4. Against non-VDS/MTAS units the submarine complies with Article 2.2.32.
5. COMEX to be initiated in accordance with OCS direction.
6. After COMEX, the submarine is to remain at Safe Depth until FINEX or STOP TIME. VDS/MTAS depth should not be considered when calculating submarine Safe Depth, and if all ships are VDS/MTAS-fitted the submarine is unrestricted in depth.

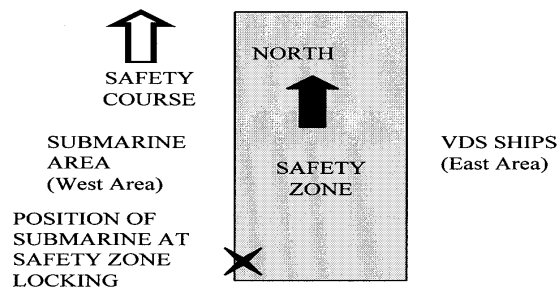
throughout.

7. ASW ships break off attacks 5 minutes before FINEX or STOP TIME.
8. The submarine is then to be surfaced in accordance with Article 2.2.73, unless relaxations in force permit otherwise.

## (NU) SPECIAL PROVISIONS

1. CASEX A-9 (Safety Zone) is designed to allow both VDS/MTAS ships and submarine freedom from depth restrictions with regard to each other.
2. The danger of submarine/VDS/MTAS collision is minimized by the establishment of a neutral corridor at the start of the exercise. Unless special relaxations are authorized (14\*), their neutral corridor is 4,000 yards wide and parallel to the safety course. As far as possible the orientation should not be at right angles to the current. When 14\* relaxations are in force, changing the shape or dimension of the neutral corridor, Figures 2-2 and 2-3 should be referred to.
3. Unless Relaxation 14\*D is in force, the lock point of the neutral corridor is the submarine position at mutual locking time, when the submarine is to be on the surface within 5 miles and in visual contact with the OCS. The submarine area is to be indicated in paragraph U of the Order Table as follows: "Submarine area West or North or East or South". The VDS/MTAS ships have the area on the other side of the Safety Zone. (See diagram.)

(NU) CASEX A-9 DIAGRAM



4. The submarine and all ships plot the Safety Zone on their plotting tables and remain in their respective areas using best available Navigation. The Safety Zone is never to be locked geographically and may not be updated except under the stringent conditions used in the initial locking. If Relaxation 14\*D is ordered, consult Article 2.2.37.1.b.(4).
5. There are no restricted areas for non-VDS/MTAS ships.
6. The OCS is always to be aboard a VDS/MTAS ship.

7. Unless Relaxations 14\*A and 14\*B are in force, this CASEX is not to exceed 2 hours. This period should be reduced in areas of strong currents/tidal streams.
8. The exercise is to be terminated if contact is lost for a period of one hour.
9. Only one run is allowed.
10. Submarine radar must be operating efficiently and radar range checked.
11. The submarine area is to be a minimum of 5 miles wide.
12. This exercise is to be conducted with visibility in accordance with Article 2.2.14.

## **(NU) RECORDS**

As required.

**INTENTIONALLY BLANK**

**CASEX A-10**

**VDS/MTAS TRACKING EXERCISE USING A SUBMARINE AREA AND SAFETY ZONE**

**(NU) PURPOSE**

1. To exercise VDS/MTAS-fitted ships in detecting and tracking a submarine.
2. To exercise VDS/MTAS ships without VDS/MTAS restrictions.
3. To exercise helos and non-VDS/MTAS ships in detecting and tracking a submarine.

**(NU) FORCES REQUIRED**

1. One or more ASW ships and/or helicopters with at least one VDS/MTAS ship.
2. One submarine.

**(NU) SITUATION**

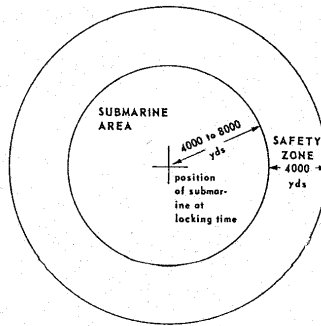
1. Submarine is on the surface or at PD at GO TIME.
2. The OCS is in visual contact and within 5 miles of the submarine. If the visibility is less than 5 miles but greater than 1 mile, a helicopter visual on top is acceptable as visual contact.

All other units are at least 8000 yards from the submarine.

**(NU) PROCEDURE**

1. OCS orders all ASW units and submarine to lock plots at GO TIME. The Submarine Area and Safety Zone are marked on the plots of the submarine and all ships.
2. On completion of plot lock, the OCS will order the submarine to dive to PD. All ships remain outside the Safety Zone and Submarine Area while the submarine is diving.
3. Ships stream VDS/MTAS outside the Safety Zone as ordered by OCS after plots have been locked. VDS/MTAS ships then maneuver as required to detect and track the submarine remaining outside the submarine area and safety zone. (See Diagram.)
4. When at PD and ready to commence the exercise, the submarine reports to the OCS "READY".
5. The OCS acknowledges the "READY" and orders "Commence CASEX A-10".
6. After the exercise commences, the non-VDS/MTAS units, including helicopters, close the position of the submarine as directed by the OCS.

## (NU) CASEX A-10 DIAGRAM



7. Against units not streaming VDS/MTAS the submarine complies with Article 2232.
8. ASW units break off the attacks 5 minutes before FINEX or STOP TIME.
9. The submarine is to be surfaced in accordance with Articles 2.2.73 and 2.2.74. VDS/MTAS ships are to remain outside the Submarine Area and Safety Zone.

### (NU) SPECIAL PROVISIONS

1. This special CASEX A-10 is designed to allow VDS/MTAS ships freedom from depth restrictions, while carrying out controlled ASW exercises.
2. The Lock Point for the Submarine Area and Safety Zone is the position of the submarine at locking time. The submarine is to be on the surface within 5 miles and in visual contact with the OCS. If the visibility is less than 5 miles but greater than 1 mile, a helicopter visual on top is acceptable as visual contact with the submarine.
3. Submarine radar must be operating efficiently and radar range checked with the OCS.
4. The submarine and all ships mark the submarine area and the safety zone on their plotting tables and remain in their respective areas using Dead Reckoning navigation. The Submarine Area/Safety Zone is never to be locked geographically and may not be up-dated except under the stringent conditions used in the initial locking.
5. During the exercise, there are no restricted areas for ships not streaming VDS/MTAS. Prior to plot lock the submarine is to be informed of the number and type of non-VDS/MTAS exercise units.
6. This CASEX is not to exceed 2-1/2 hours, and in areas of strong or variable tidal current this period should be reduced.
7. This CASEX is to be conducted with visibility in accordance with Article 2.2.14.

8. The Submarine Area is to be a circle with a 4000-8000 yard radius, dependent on environmental conditions. The radius should normally be specified in the CASEX message but may be modified.
9. The Safety Zone is a 4000 yard extension of the Submarine Area and may be modified by Relaxation 14\*E.
10. The OCS is to be informed by a participating unit:
  - a. When it is considered that the submarine is proceeding outside the Submarine Area.
  - b. When the unit is in doubt as to its position relative to the Safety Zone.
  - c. If the submarine is believed to be leaving the Submarine Area and communications cannot be established with the submarine on UWT or SST. The OCS will order ships to clear the area and he will surface the submarine using explosive charge signal A5.
11. Relaxation 7\*A or 7\*B may never be approved concurrently with 2\*J.
12. COMEX will be initiated using explosive charge signal A4 by the first non-VDS/MTAS ship or helo gaining sonar contact.
13. The OCS is to be in a VDS/MTAS fitted ship for this CASEX.
14. Voice procedure for plot lock is to be conducted as follows:

OCS – “STANDBY TO LOCK PLOTS IN 1 MINUTE”.

OCS – “LOCK PLOTS NOW, NOW, **NOW**, TIME \_\_\_\_\_.”

On the third of the three “NOWS” all ships and submarines lock plots.

## (NU) RECORDS

As required.

**INTENTIONALLY BLANK**

## CASEX A-11

### SONAR PASSIVE TRACKING

#### (NU) PURPOSE

1. To exercise an ASW team in procedures for passively tracking a quiet submarine through use of passive bearings only.
2. To exercise sonar operators in operation of passive sonar equipment and classification of targets.
3. To develop proficiency in internal communications.

#### (NU) FORCES REQUIRED

1. One or more ASW ships with passive sonar capability.
2. One submarine.

#### (NU) SITUATION

1. Submarine is on the surface or at PD not less than 1500 yards from exercise ship(s).
2. When surface units have gained passive contact and are ready, the OCE orders the submarines to submerge to a Safe Depth.
3. When the submarine reports at Safe Depth and the surface units are ready, the OCE orders COMEX. The surface units then maneuver as necessary to maintain passive contact out to the maximum possible range.

#### (NU) PROCEDURES

1. The OCE shall:
  - a. Assign station to ASW ship(s) normally on the quarter of the submarine at a distance that would ensure good passive contact.
  - b. Establish initial base course and speed of participating ships.
  - c. Promulgate course and speed maneuvers, if any, to the submarine. Maneuvers should be kept simple, dependent upon training level of surface ships/operators, and should vary from no maneuvers for basic training to three known speed changes per hour for advanced training.
  - d. Order COMEX when the submarine reports at Safe Depth and all units are ready.

2. ASW ship(s):

- a. Take station as directed by OCE.
- b. Notify OCE when ready to commence passive tracking.
- c. Track submarine as it submerges. When the submarine is at Safe Depth and OCE orders COMEX, maneuver as necessary to track the submarine. Maintain position that presents good passive contact.
- d. Determine submarine course and speed by plotting passive bearings and through use of assist ship(s) bearings if available. Check accuracy of course and speed plotted when the submarine transmits courses and speeds.

3. The submarine shall:

- a. When ordered by the OCE, take any depth which meets the separation requirements of Table 2-2, remaining above the thermal layer if possible. Report when at Safe Depth.
- b. At COMEX, maneuver in accordance with exercise instructions.

**(NU) SPECIAL PROVISIONS**

None.

**(NU) RECORDS**

1. Transmit courses and speeds to ASW ship(s) after FINEX.
2. As required by OCE.

**CASEX A-12**

**SONAR PASSIVE TRACKING (MULTI-SHIP)**

**(NU) PURPOSE**

1. To exercise ASW teams of two or more surface ships in procedures for passively tracking and plotting a quiet, maneuvering submarine through use of passive bearings only with assistance from another passive surface ship.
2. To exercise sonar operators in operation of passive sonar equipment and classification of targets.

**(NU) FORCES REQUIRED**

1. Two or more ASW ships with passive sonar capability. Ships must have satisfactorily completed CASEX A-11.
2. One submarine.

**(NU) SITUATION**

1. Submarine is on the surface or at PD not less than 1500 yards from exercise ships.
2. When surface units have gained contact and are ready, the OCE orders the submarine to go to a Safe Depth.
3. When the submarine reports at Safe Depth and the surface units are ready, the OCE orders COMEX. Surface units then maneuver as necessary to maintain contact out to the maximum range possible while tracking the submarine.

**(NU) PROCEDURES**

1. The OCE shall:
  - a. Assign stations to ASW ships, normally on the quarters of the submarine at a distance that would ensure good passive contact.
  - b. Establish initial base course and speed of participating ships.
  - c. Order COMEX when the submarine reports at Safe Depth and all the units are ready.
2. ASW ship(s):
  - a. Take stations as directed by OCE.
  - b. Notify OCE when ready to commence passive tracking.

- c. Track submarine as it submerges. When the submarine is at Safe Depth, and the OCE orders COMEX, maneuver as necessary to maintain contact and favorable firing position.
  - d. Determine submarine course and speed by plotting passive bearings and through use of assist ship(s) bearings. Check accuracy of course and speed plotted when the submarine transmits courses and speeds.
3. The submarine shall:
- a. When ordered by OCE, proceed to any depth which meets minimum separation requirements of Table 2-2 and report.
  - b. After COMEX and at intervals of 12 to 15 minutes, change course 30 to 60 degrees, change speed by at least three knots, and change depth by at least 60 meters (200 feet). Operate on three different courses, speeds and depths during a 45-minute exercise.

## **(NU) SPECIAL PROVISIONS**

None.

## **(NU) RECORDS**

- 1. Transmit course, speed, depth changes and times to ASW ships after FINEX.
- 2. As required by OCE.

**CASEX A-13**

**PASSIVE TRACKING EXERCISE**

**(NU) PURPOSE**

1. To train the shipboard ASW team to track a target submarine using passive sonar only.
2. To train the shipboard ASW team in determining target range using Target Motion analysis (TMA) procedures.

**(NU) FORCES REQUIRED**

1. One or more ASW ship(s) with passive sonar capability.
2. One submarine.

**(NU) SITUATION**

1. Ships are positioned outside predicted passive sonar range to submarine.
2. Submarine and ship base courses and speeds are established so that ships should gain contact 20-30 minutes after COMEX. Submarine must maintain base course and speed during first 30 minutes of exercise.
3. Three exercise training levels based upon submarine maneuvering restrictions and exercise training objectives may be assigned as follows:
4. Basic - Submarine maintains constant course and speed.
5. Intermediate - Submarine makes one course change of less than 30 degrees and one speed change of 2 knots during each hour of the exercise.
6. Advanced - Submarine makes two 30-60 degree course changes and two speed changes of 3-5 knots during each hour of the exercise.

**(NU) PROCEDURE**

1. Establish communications prior to GO TIME.
2. Establish FINEX Time.
3. After all ships and the submarine report "Ready", the OCE/OCS initiates COMEX.
4. Ships and submarine come to base course and speed.
5. Diesel electric submarines snorkel during first 40 minutes of exercise and during at least 30 minutes of each hour of the exercise. Between snorkel periods diesel-electric submarines may go to Safe Depth, remaining at best detection depth, if

feasible. If predetermined submarine source levels are not high enough to allow passive tracking, nuclear submarines may be ordered to maneuver at high speeds (or otherwise raise self-noise levels).

6. Ships carry out passive sonar ASW search and tracking. Shipboard ASW teams are to conduct standard TMA techniques to estimate target range. When more than one participant holds contact, units should periodically exchange range estimates.
7. Ships break off tracking 5 minutes prior to FINEX.
8. At FINEX submarine is surfaced in accordance with Article 2.2.73 unless relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

Ships should maintain radar and visual watches as a safety precaution and contacts should be passed to the bridge for maneuvering purposes. Contacts should not, however, be divulged to the ship plotting team in CIC.

## **(NU) RECORDS**

As required.

## CASEX A-21

### BASIC PASSIVE TRACKING EXERCISE

#### (NU) PURPOSE

To exercise the TAS Unit command and analysis team in basic classification, tracking, Target Motion Analysis (TMA) and cross-fixing procedures.

#### (NU) FORCES REQUIRED

1. One or more TAS units.
2. One noise enhanced submarine.

#### (NU) SITUATION

1. Submarine is at start position, at PD at GO TIME.
2. TAS Unit with array streamed, is on specified side of safety haven/zone within UHF communication range of the submarine.

#### (NU) PROCEDURE

1. Establish communications prior to COMEX.
2. TAS Unit and submarine lock plots. Safety haven/zone to be drawn on both TAS Unit and submarine plots.
3. Establish proper working order of noise augments.
4. When ready, TAS Units initiate COMEX and orders the submarine to proceed to best tracking depth.
5. Submarine proceeds on track ordered in CASEX signal.
6. TAS Unit maneuvers to maintain contact, opening and closing range as required for TMA.

#### SPECIAL PROVISIONS

1. The risk of submarine and TAS Unit collision is reduced by the establishment of the safety haven/zone specified in the CASEX signal (see 14 Series Relaxations).
2. Primary communications are by Secure Voice or UWT.

#### (NU) RECORDS

See Article 6.3.

**INTENTIONALLY BLANK**

## **CASEX A-22 LONG-RANGE PASSIVE DETECTION AND LOCALIZATION EXERCISE**

### **(NU) PURPOSE**

1. To exercise a TAS Unit command team in establishing an effective barrier patrol in a known Area of Probability (AOP).
2. To exercise command team in classification, Target Motion analysis and localization of a submarine whose route is predicted.
3. To exercise passive sonar operators in initial detection and classification of a submarine.

### **(NU) FORCES REQUIRED**

1. One or more TAS Units.
2. One noise enhanced submarine.
3. ASW helicopters, if available.

### **(NU) SITUATION**

1. Submarine is at start position at PD at GO TIME.
2. TAS Unit with array streamed, establishes a barrier patrol outside the submarine safety haven promulgated in the CASEX signal.

### **(NU) PROCEDURE**

1. The submarine and TAS Unit should take a satisfactory fix as close as practicable to GO TIME, and thereafter as frequently as possible.
2. COMEX is assumed at GO TIME.
3. At COMEX submarine is to proceed to the best depth for tracking (unless otherwise ordered) on the track ordered in the CASEX signal, minimizing maneuvers, except as necessary, to clear stern arcs.
4. TAS Unit attempts to detect, track and localize submarine remaining outside the submarine safety haven.
5. ASW helicopters may be used to assist tracking and localization operating in or outside the safety haven.

## **(NU) SPECIAL PROVISIONS**

The risk of submarine and TAS Unit (hull or array) collision is minimized by the establishment of a submarine safety haven of 4000 yards radius based on the submarine track ordered in the CASEX signal.

**(NU) RECORDS** See Article 6.3.

**CASEX A-23**

**(NMM) NOT RELEASABLE**

**INTENTIONALLY BLANK**

## CASEX A-24

### INTERMEDIATE ASW AREA SEARCH

#### (NU) PURPOSE

1. To exercise one or more ships and/or helicopters in the conduct of Intermediate ASW Area Search Operations.
2. To exercise submarines in detection avoidance and subsequent simulated attack on escorts without being counter detected.
3. To exercise sonar operators in initial detection and contact classification.

#### (NU) FORCES REQUIRED

1. One or more ships assisted by ASW helicopters, if available.
2. One submarine.

#### (NU) SITUATION

Submarine is on patrol in allocated areas and has freedom to maneuver limited only by Table 2-2.

#### (NU) PROCEDURE

1. Units conduct ASW Area Search until contact gained.
2. To avoid submarine smokes influencing the classification process, attacks are to be marked with signal A1 until completion of the first period of ASW action. In any subsequent period of ASW action, attacks may be marked by any appropriate signal.
3. Duration is to be 30 minutes or until STOP TIME.
4. Relaxations 2\*J, 3A, 3D, 3\*E, 3\*H, 3\*K are to be considered.
5. If sufficient serial time remains at FINEX, ship(s) may break off and attempt to regain contact re-establishing COMEX as required.
6. Unit(s) break off attacks 5 minutes before FINEX.
7. Submarine need not return to PD at STOP TIME.

#### (NU) SPECIAL PROVISIONS

Although this CASEX is predominantly designed for surface ships, it has been written to allow submarine training as individual submarine Commanding Officers see fit. Submarine is

to provoke attacks by surface forces in the final hour of the serial if no contact has been gained.

**(NU) RECORDS**

See Article 6.3.

## CASEX B-1

### BASIC SEARCH, HOMING AND ATTACK BY AIRCRAFT

#### (NU) PURPOSE

1. To exercise aircraft in search, detection, classification, homing procedures and attack.
2. To exercise submarines in visual detection of aircraft.

#### (NU) FORCES REQUIRED

1. One or more aircraft.
2. One or more submarines.

#### (NU) SITUATION

1. The submarine will provide the type and degree of detection opportunity desired by conducting surfaced, periscope, or snorkeling operations as ordered. Submarine course and speed may be restricted or unrestricted.
2. The initial position of the aircraft will be determined by the type of search to be conducted. Detection may be followed by homing and illumination and/or attacks.

#### (NU) PROCEDURE

1. Establish communications prior to GO TIME.
2. Submarine reports "Ready to commence the exercise".
3. At GO TIME submarine proceeds as ordered and aircraft conducts type of search/homing/illumination and attack runs ordered.
4. Aircraft breaks off attacks five minutes before STOP TIME.
5. At STOP TIME the submarine establishes communications with the aircraft.

#### (NU) SPECIAL PROVISIONS

When more than one aircraft is operating with the same submarine, the senior aircraft commander assumes the responsibilities of the Scene of Action Commander (SAC).

#### (NU) RECORDS

As required.

**INTENTIONALLY BLANK**

## CASEX B-2

### BASIC LOCALIZATION AND ATTACK BY AIRCRAFT

#### (NU) PURPOSE

1. To exercise aircraft in localizing, classifying, tracking and attacking a submerged submarine, the initial position of which is known.
2. To exercise a submarine in evasion.

#### (NU) FORCES REQUIRED

1. One or more aircraft.
2. One submarine.

#### (NU) SITUATION

1. When ordered, the submarine acts as a submerged target and may be restricted or unrestricted.
2. The initial position of the aircraft is determined by the type of localization to be conducted.

#### (NU) PROCEDURE

1. Prior to GO TIME, aircraft and submarine must be in visual contact, and establish communications.
2. Submarine reports "Ready to commence the exercise".
3. Aircraft initiates COMEX.
4. At COMEX, submarine dives and maneuvers as prescribed by exercise instructions.
5. EER charges are not to be employed within five minutes of FINEX or STOP TIME, whichever is earlier.
6. At FINEX or STOP TIME, the submarine surfaces or returns to PD, at the discretion of the Commanding Officer, and establishes communications with the aircraft.

#### (NU) SPECIAL PROVISIONS

When more than one aircraft is operating with the same submarine, the senior aircraft commander assumes the responsibilities of Scene of Action Commander (SAC).

#### (NU) RECORDS

As required.

## **CASEX B-3**

### **ADVANCED SEARCH, LOCALIZATION AND ATTACK BY AIRCRAFT**

#### **(NU) PURPOSE**

1. To exercise aircraft in search for, localizing, and attacking submarine.
2. To exercise submarines in detecting and evading aircraft.

#### **(NU) FORCES REQUIRED**

1. One or more aircraft.
2. One or more submarines.

#### **(NU) SITUATION**

1. At GO TIME, the submarine is in a defined area with a specific mission which must be accomplished within conditions ordered.
2. Aircraft conduct an area search designed to detect the submarines.

#### **(NU) PROCEDURE**

1. Prior to GO TIME the aircraft and submarine may be ordered to establish communications by an instruction of the Order Table. Otherwise, they wait until the end of the first ASW action or STOP TIME to establish communication.
2. After GO TIME, the submarine is to take appropriate action when action aircraft are detected.
3. After GO TIME, the aircraft is to take appropriate action to detect, localize and attack the submarine.
4. EER charges are not to be employed within 5 minutes of FINEX or STOP TIME, whichever is earlier.
5. At FINEX or STOP TIME the submarine either surfaces or returns to PD, at the discretion of the submarine commanding officer, and establishes communications with the aircraft. If time remains, the exercise can be initiated again or another CASEX ordered.

#### **(NU) SPECIAL PROVISIONS**

1. When more than one aircraft is operating with the same submarine, the senior aircraft Commander assumes the responsibilities of the Scene of Action Commander (SAC).

2. GO TIME/COMEX may be ordered to be coincident for this exercise. COMEX is initiated by the first aircraft attack using signal A4 or MK 84 Code 1.

**(NU) RECORDS**

(NU) See Article 6.3.

## CASEX B-4

### BASIC AIR/SUB OPERATION EXERCISE

#### (NU) PURPOSE

To train submarines and aircraft in air/sub operations against a snorkeling submarine target or surface contacts of opportunity.

#### (NU) FORCES REQUIRED

1. One or more, nuclear powered or snorkel-equipped, submarines equipped with medium or long-range passive sonar.
2. One or more ASW aircraft.
3. One snorkel-equipped transiting submarine.

#### (NU) SITUATION

1. Patrolling friendly submarines are in assigned JTAA's within the exercise area and transiting submarine is in assigned start position at communication depth prior to GO TIME.
2. Cooperating aircraft are in assigned Aircraft Patrol Areas (APA) prior to GO TIME.
3. The transiting submarine will operate to provide a maximum number of incidents between GO TIME and STOP TIME.

#### (NU) PROCEDURE

1. Submarines and assigned cooperating aircraft start establishing communication 45 minutes prior to GO TIME. Aircraft will designate type of rendezvous desired (e.g., Net Ball, Sunlamp, etc.).
2. All participants report "Ready to Go" to the OTC/OCS at GO TIME.
3. At GO TIME:
  - a. Aircraft report "Ready" to cooperating submarines and commence operations in assigned APAs.
  - b. Friendly submarines in JTAA's dive and commence patrols.
  - c. Transiting submarine dives and commences transit as directed.

4. On gaining contact, submarines cooperate with assigned aircraft, employing the procedures promulgated in the current air/sub operation doctrine.
5. On being attacked, by any means, the transiting submarine is to secure snorkeling and evade for the duration of the specified ASW action period, giving due regard to the Safety Instructions.
6. On completion of the cooperating phase:
  - a. The OTC/OCS orders cooperating units to return to their assigned patrol areas in preparation for the next phase, and target data is exchanged.
  - b. On completion of the exchange of information, the patrolling submarine goes to best depth.
  - c. The transiting submarine resumes snorkel transit.
7. At STOP TIME:
  - a. The patrolling submarine surfaces and report results to OTC/OCS.
  - b. The cooperating aircraft proceed as previously directed (when released).
  - c. The transiting submarine surfaces and reports to the OTC/OCS giving an evaluation of attacks received.

## **(NU) SPECIAL PROVISIONS**

1. By the OSE, designate:
  - a. Transiting submarine's SOA.
  - b. Operating instructions for transiting submarines, designed to generate a maximum number of incidents.
  - c. Simulated weapon assignments and loadings.
  - d. The OCE.
2. By the OTC/OCS:
  - a. Prepare and send the CASEX message using the Order Table (Table 3-1), and obtain acknowledgement from all participants.
  - b. Coordinate with the appropriate SUBOPAUTH and AIROPAUTH to:
  - c. Establish JTAAs and APAs for friendly forces and a submarine exercise operating area(s) for the transiting submarine(s).

- d. Order the appropriate level of cooperation in accordance with current Air/Sub operations doctrine.
  - e. Specify required measures to prevent mutual interference including depth strata assignments, stovepipe/skylight plan, and safety orders for patrolling and transiting submarines. Provisions of Article 2.2.13 of this publication apply.
  - f. Designate the duration of each cooperative phase of ASW action.
- 3. Simulated attacks may be made using appropriate attack signals and safety precautions contained in Articles 2.2.40, 2.2.52.1.b. and 1.c., and 2.2.5
  - 4. When surface targets of opportunity are used for this exercise, only "Call for Assistance" "Aircraft Approach Methods" and "Contact Handover" procedures are to be conducted.

## **(NU) RECORDS**

As required.

**INTENTIONALLY BLANK**

## CASEX B-5

### ADVANCED AIR/SUB OPERATION EXERCISE

#### (NU) PURPOSE

To train submarines and aircraft in advanced air/sub operations. Such training includes detection, classification, localization and attack with evasion and attack by transiting submarines allowed.

#### (NU) FORCES REQUIRED

1. Two or more, nuclear-powered or snorkel-equipped, submarines equipped with medium or long range passive sonar. Active sonar may also be employed.
2. One or more ASW aircraft.
3. One or more nuclear-powered or snorkel-equipped transiting submarines.

#### (NU) SITUATION

1. Patrolling friendly submarines are in assigned JTAA's within the exercise area and transiting submarines are in assigned start positions at communication depth prior to GO TIME.
2. Co-operating aircraft are in assigned APAs prior to GO TIME.
3. Transiting submarines conduct their transit to avoid detection and are to attack patrolling submarines as opportunity occurs.

#### (NU) PROCEDURE

4. All participants establish communications with the OTC 45 minutes prior to GO TIME in accordance with the COMPLAN.
5. All participants report "Ready to Go" to the OTC/OCS at GO TIME.
6. At GO TIME:
  - a. Aircraft report "Ready" to cooperating submarines and commence operations in assigned APAs.
  - b. Friendly submarines in JTAA's dive and commence patrols.
  - c. Transiting submarines dive and commence transits as directed.
7. On gaining contact, submarines and assigned aircraft conduct operations prescribed in current air/sub operations doctrine.

8. Patrolling submarines are to conduct attacks on transitors as opportunity occurs.
9. On completion of each incident, cooperating units exchange target information.
10. At STOP TIME:
  - a. Patrolling submarines surface and report results to the OTC/OCS.
  - b. Aircraft proceed as directed by the OTC/OCS.
  - c. Transiting submarines surface and report to the OTC/OCS, giving an evaluation of attacks received.

## **(NU) SPECIAL PROVISIONS**

1. The OSE designates:
  - a. Transiting submarine's SOA.
  - b. Points through which transiting submarines are to pass.
  - c. Evasion and attack restrictions for transiting submarine.
  - d. Simulated weapon assignments and loadings for all participants.
  - e. The OCS (preferably HQ ashore).
2. By the OTC/OCS:
  - a. Prepare and send the CASEX message using the Order Table (Table 3-1), and obtain acknowledgement from all participants.
  - b. Coordinate with the appropriate SUBOPAUTH and AIROPAUTH to:
  - c. Establish JTAAs and APAs for friendly forces and a submarine exercise operating area(s) for the transiting submarine(s).
  - d. Order the appropriate level of cooperation in accordance with current Air/Sub operations doctrine.
  - e. Specify required measures to prevent mutual interference including depth strata assignments, stovepipe plan/skylight, and safety orders for patrolling and transiting submarines. Provisions of Article 2.2.13 of this publication apply.
  - f. Designate the duration of each ASW action.
3. Simulated attacks by all participants may be made using the appropriate attack signals and the safety precautions contained in Articles 2.2.40, 2.2.52.1.b. and 1.c., and 2.2.54.

**(NU) RECORDS**

Full records as required.

**INTENTIONALLY BLANK**

## CASEX B-6

### BASIC PASSIVE TRACKING AND ATTACK BY AIRCRAFT

#### (NU) PURPOSE

To exercise aircraft in the passive tracking and attacking of submarines.

#### (NU) FORCES REQUIRED

1. One aircraft (OCS).
2. One nuclear submarine or noise enhanced diesel electric submarine.

#### (NU) SITUATION

1. At GO TIME the submarine is in a defined area with the specific mission of proceeding to a given position by STOP TIME.
2. The aircraft conducts passive tracking and attacks on passive information.

#### (NU) PROCEDURE

1. Prior to GO TIME the aircraft and submarine rendezvous to establish communications and to lock plots.
2. After GO TIME the submarine is to proceed to an ordered position making major course alterations at a frequency not exceeding 2 per hour and as directed by the OCS.
3. After GO TIME the aircraft is to take appropriate action to passively track and attack the submarine in passive information.
4. The submarine is to acknowledge all aircraft attacks with a smoke candle, and record the time interval between hearing the attack and firing the candle.
5. Aircraft crews are to measure the accuracy of all attacks by timing from on top the attack marker to on top the submarine candle.
6. SUS are not to be employed within 5 minutes of FINEX or STOP TIME, whichever is earlier.
7. At FINEX or STOP TIME the submarine either surfaces or returns to PD, at the discretion of the submarine commander. After establishing communications, the submarine is to pass the submarine track plot and the time intervals between hearing aircraft attack and firing candles. The aircraft is to mark on top the submarine's position to lock plots.

**(NU) SPECIAL PROVISIONS**

GO TIME-COMEX are coincident for this exercise.

**(NU) RECORDS**

As required.

**CASEX B-7**

**DEFENCE OF A COASTAL AREA BY MPA AGAINST SUBMARINE IN MIO**

**(NU) PURPOSE**

1. To exercise aircraft in localizing, classifying and attacking a submarine in MIO patrolling along a coastline.
2. To exercise submarines in patrolling littoral waters collecting information (IMINT, COMINT, ELINT) and avoiding MPA detection.
3. To exercise participants in conducting inshore operations.

**(NU) FORCES REQUIRED**

1. One ASW aircraft or more.
2. One submarine.

**(NU) DURATION**

3 to 5 hours – Day or Night.

**(NU) LIMITATION**

Environmental conditions: sea state and area size in accordance with MPA radar limitations.

**(NU) SITUATION**

1. At GO TIME, the submarine is in a defined area in littoral waters with a specific intelligence mission.
2. ASW aircraft conduct an area search to detect, classify and attack the submarine.

**(NU) PROCEDURE**

1. No communication established between participants prior to GO TIME in order to increase exercise realism.
2. After GO TIME, the submarine executes her mission at CO discretion, raising masts in accordance with primary mission (IMINT, COMINT, and ELINT).
3. The submarine returns at PD to transmit result of investigations to her OPCON.

4. The ASW aircraft is to take appropriate behavior to detect, classify and attack submarine. MPA initiate COMEX when gaining contact. Attacks are not allowed within 5 minutes of FINEX or STOP TIME.
5. After GO TIME, the submarine is to take appropriate action to evade when detected.
6. After ASW action, a 45 minute out of period is initiated.
7. At FINEX, or STOP TIME the submarine establish communication for hot wash up at CO discretion, only if no other B-7 CASEX scheduled.

## **(NU) SPECIAL PROVISIONS**

1. OSE will inform ASW aircraft on Risk Level and on MANPAD threat.
2. ASW aircraft will not radar shine on search area before GO TIME.
3. The submarine transmits environmental conditions to MPA home base at GO TIME minus 3 hours.

## **(NU) RECORDS**

See Article 6.5 (give details on number of masts raised when at PD).

**CASEX C-1**

**(NMM) NOT RELEASABLE**

**INTENTIONALLY BLANK**

## CASEX C-2

### BASIC COORDINATED ASW EXERCISE

#### (NU) PURPOSE

1. To exercise ASW units in localizing, attacking, and reporting a submarine whose initial position is known.
2. To exercise ASW units in Scene of Action Commander (SAC) duties.

#### (NU) FORCES REQUIRED

1. One or more ships and helicopters.
2. One or more fixed wing aircraft.
3. One submarine.

#### (NU) SITUATION

1. Submarine is on the surface or snorkeling, at 10-20 miles from the ships and helicopters, and remains in the vicinity of its initial position until attacked by fixed wing aircraft. If aircraft fail to locate the submarine, the latter should assist the aircraft by any means available.
2. Initial contact is made by fixed wing aircraft. After first attack, submarine goes to most favourable depth to facilitate tracking.
3. SAU is formed.

#### (NU) PROCEDURE

1. Units establish communications prior to GO TIME.
2. Prior to GO TIME, aircraft completes Joining Procedure.
3. Aircraft locates, attacks and tracks submarine, making contact reports to OTC/ OCS.
4. Helicopters and ships close scene of action as ordered by OTC/OCS.
5. Submarine goes to Safe Depth in accordance with the Safety Precautions and the relaxations in force.
6. If the submarine is prematurely forced deep, it may return to PD, when safe to do so, provided COMEX has not been initiated.
7. SAC tracks, attacks and reports the submarine.

8. SAU Commander initiates SWAP.
9. First ship or helicopter in the SAU gaining contact initiates COMEX.
10. Carry out ASW action.
11. Submarine acts in accordance with Exercise Instructions.
12. Submarine remains at Safe Depth until FINEX or STOP TIME depending on relaxations in force.
13. ASW units break off attack five minutes before FINEX.
14. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73 unless relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

1. To provide balanced training, the exercise should progress through the following three phases:
  - a. Phase One. Search by aircraft, resulting in a contact and attack, with subsequent tracking and reporting. (Recommended duration 30 minutes.)
  - b. Phase Two. SAU approaches Datum; helicopters are homed by aircraft to contact (or Datum) to assist prosecution of the contact. (Recommended duration 30 minutes.)
  - c. Phase Three. SAU arrives at Scene of Action, executes SWAP and prosecutes contact in a coordinated ASW action until FINEX or STOP TIME. (Recommended duration 30 minutes.)

### **Note.**

*The duration of phases may be varied by the OTC/OCS to accomplish specific objectives.*

2. Aircraft tracking methods, with times, should be specified.

## **(NU) RECORDS**

As required.

## CASEX C-3

### ADVANCED COORDINATED ASW EXERCISE

#### (NU) PURPOSE

To exercise ASW ships, helicopters and fixed wing aircraft in coordinated ASW search and attack tactics including advanced SAU procedures.

#### (NU) FORCES REQUIRED

1. Two or more ASW ships and helicopters.
2. One or more fixed wing aircraft.
3. One submarine.

#### (NU) SITUATION

1. Submarine is on surface or snorkeling in a delineated area, its position unknown to participating units. Aircraft should be outside the area at least 30 miles from the submarine, ships should be at least 10 miles from the submarine, or at least five miles further than the longest Convergence Zone (CZ)/Bottom Bounce (BB) range if ship sonars are CZ/BB mode capable, depending on training objectives. The submarine is to remain the surface or continue snorkeling until attacked by ASW aircraft.
2. Initial contact is made by aircraft. After first attack, submarine dives to most favorable depth to facilitate tracking.
3. SAU is formed.

#### (NU) PROCEDURES

1. Units establish communications prior to exercise commencement (GO TIME).
2. Aircraft complete joining procedures (if applicable) prior to GO TIME.
3. At GO TIME, aircraft commence ASW search as directed by SAU commander, locates, attacks and tracks submarine, making contact reports to the OTC/OCS.
4. Submarine goes to Safe Depth in accordance with the Safety Precautions and the relaxations in force.
5. SAU closes scene of action, conducting Direct Path (DP), CZ or BB, active or passive sonar operations as dictated by exercise training objectives. If aircraft weapons are available, CZ/BB environmental conditions exist, and ships are CZ/BB sonar mode capable, the SAU need not enter the Torpedo Danger Area (TDA).
6. First unit gathering contact initiates COMEX.

7. SAU conducts ASW prosecution; including directing aircraft ASW operations, swap with aircraft and simulated attacks (if tactically advisable, or if ships cannot conduct CZ/BB sonar operations).
8. Submarine acts in accordance with exercise instruction.
9. Submarine remains at Safe Depth until FINEX or STOP TIME, depending upon relaxations in force.
10. ASW units continue prosecution and attacks, breaking off action five minutes prior to FINEX.
11. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73 unless relaxations in force permit otherwise.

## **(NU) RECORDS**

As required.

## CASEX C-4

### ADVANCED COORDINATED ASW EXERCISE - PROTECTION OF A FORCE

#### (NU) PURPOSE

1. To exercise ASW units in protecting a force in a submarine probability area.
2. To exercise submarines in tracking, reporting, attacking and avoiding detection.

#### (NU) FORCES REQUIRED

1. One or more ships representing the main body.
2. Assigned ASW units.
3. An aircraft carrier, if available, or aircraft control unit.
4. Carrier borne and/or land based aircraft.
5. One or more submarines.

#### (NU) SITUATION

1. Submarines are positioned to detect and track the main body transiting a prescribed exercise area.
2. When detecting the main body, submarines may be required to report to authority designated by OSE; carry out attacks, avoiding detection.
3. ASW forces will oppose submarines to prevent attacks on the main body.
4. The track of the main body is planned to meet the training objectives of the participating forces.

#### (NU) PROCEDURE

1. When detecting ASW units, submarines take appropriate action.
2. Submarines go to Safe Depth in accordance with the Safety Precautions and the relaxations in force.
3. If submarines are prematurely forced deep, they may return to PD, when safe to do so, provided COMEX has not been initiated.
4. Fixed wing aircraft carry out attacks at every opportunity, marking the attacks by signal A2 or Mk 84 Code and subsequent attacks by Signal A1, A2 or Mk 84 Code 1. Prosecution of contact continues until relieved or as ordered by the authority

controlling the aircraft.

5. The first ASW unit gaining contact may initiate COMEX in accordance with OCE/OCS instructions and prosecute the contact.
6. Submarine remains at Safe Depth until FINEX or STOP TIME unless relaxations in force otherwise permit.
7. Units break off attack 5 minutes before FINEX, and depart the Scene of Action to facilitate continuation of the exercise (see Relaxations 3D and 3\*H).
8. At FINEX, a submarine which has been engaged is to act in accordance with relaxations and Exercise Instructions in force.

## **(NU) SPECIAL PROVISIONS**

1. Participating submarines must be positioned to avoid mutual interference.
2. Submarines may be aided by cooperating aircraft or ships.
3. Out of action periods may be declared to reposition participants.

## **(NU) RECORDS**

As required.

## CASEX C-5

### ADVANCED COORDINATED ASW EXERCISE AGAINST TRANSMITTING/PATROLLING SUBMARINES

#### (NU) PURPOSE

1. To exercise ASW forces in carrying out coordinated operation against transiting or patrolling submarines.
2. To exercise transiting or patrolling submarines in evading ASW forces.

#### (NU) FORCES REQUIRED

1. Ships, helicopters and fixed-wing aircraft are assigned.
2. One or more submarines.

#### (NU) SITUATION

1. At GO TIME, submarines are positioned within a defined area, and given a transit or patrol mission, acting to avoid detection by ASW forces.
2. ASW forces commence search at GO TIME, in positions which provide exercise realism.

#### (NU) PROCEDURE

1. On detecting ASW units, the submarine is to take appropriate action.
2. Submarines go to Safe Depth in accordance with the Safety Precautions and the relaxations in force.
3. If submarines are prematurely forced deep, they may return to PD, when safe to do so, provided COMEX has not been initiated.
4. Fixed-wing aircraft and helicopters carry out attacks at every opportunity, marking the attacks by signal A1 or MK84 Code 1. Prosecution of the contact continues until relieved or as ordered by the authority controlling the aircraft.
5. The first ASW unit gaining contact may initiate COMEX in accordance with OCE/OCS instructions and prosecute the contact.
6. Submarines remain at Safe Depth until FINEX or STOP TIME unless relaxations in force otherwise permit.
7. Units break off attacks 5 minutes before FINEX, and depart the scene of action to facilitate continuation of the exercise. (See Relaxations 3D and 3\*H.)

8. At FINEX, the submarine which has been engaged is to act in accordance with Relaxation and Exercise Instructions in force.

## **(NU) SPECIAL PROVISIONS**

1. Out-of-action periods may be declared to reposition forces.
2. Counter-attacks by submarines must be positioned to avoid mutual interference.
3. Submarines may be aided by cooperating aircraft or ships.

## **(NU) RECORDS**

As required.

## CASEX C-6

### VDS/MTAS EXERCISE USING SAFETY ZONE SEPARATION

#### (NU) PURPOSE

1. To exercise ASW units, including VDS/MTAS fitted ships, in detecting and attacking a submarine.
2. To exercise ASW units in Scene of Action Commander (SAC) duties.

#### (NU) FORCES REQUIRED

1. One or more ASW ships/helicopters with at least one VDS/MTAS ship.
2. One or more fixed-wing aircraft.
3. One submarine.

#### (NU) SITUATION

1. Submarine is on the surface or at PD at GO TIME.
2. The OCS is in visual contact and within 5 miles of the submarine. Under Relaxation 14\*D, the exercise may be started when the participants are not in visual contact. (See Article 2.2.37.(1).b.(4).).
3. The aircraft starts joining the ships at GO TIME.

#### (NU) PROCEDURE

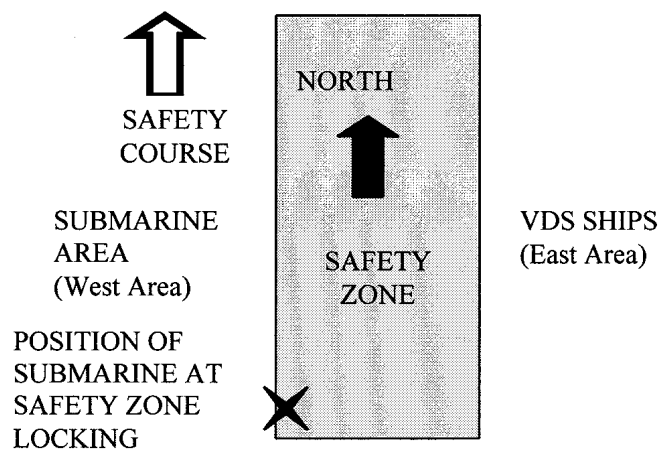
1. OCS orders all ASW units and submarine to lock plots at GO TIME. The Safety Zone (see Special Provisions) is marked on the plots of submarine and all ships.
2. The ships do not come within 10 nautical miles of the submarine while the aircraft joins, or they open out if they have been directed to close at GO TIME for a visual fix.
3. The aircraft, on completion of joining the ships; locates, attacks and tracks the submarine, making contact reports to the OCS.
4. The submarine dives when attacked by the aircraft and maneuvers to facilitate tracking without going into the Safety Zone.
5. SAU closes the scene of action as ordered by the OCS. VDS/MTAS ships must not enter the Safety Zone.
6. Against non-VDS/MTAS ships, the submarine complies with Article 2.2.32.
7. SAU Commander initiates SWAP.

8. First unit gaining contact initiates COMEX.
9. Submarine acts in accordance with the exercise instructions, remaining on her own side of the Safety Zone. The submarine is to remain at Safe Depth until FINEX or STOP TIME, VDS/MTAS depth should not be considered when calculating submarine Safe Depth, and if all ships are VDS/MTAS-fitted the S/M is unrestricted in depth throughout.
10. ASW ships break off attacks 5 minutes before FINEX or STOP TIME.
11. The submarine is to be surfaced in accordance with Article 2.2.73, unless relaxation in force permits otherwise.

## (NU) SPECIAL PROVISIONS

1. This special CASEX C-6 (Safety Zone) is designed to allow both VDS/MTAS ships and submarine freedom from depth restrictions with regard to each other.
2. The danger of submarine/VDS/MTAS collision is minimized by the establishment of a central corridor at the start of the exercise. Unless special Relaxation (14\*) is granted, the central corridor shall be 4,000 yards wide and parallel to the safety course. Insofar as possible, it shall not be at right angles to the current. When Relaxations 14\* is in effect, any change in the profile or dimensions of the central corridor shall conform to Figures 2-2 and 2-3.
3. Unless Relaxation 14\*D is in effect, the lock point for the central corridor is the position of the submarine at mutual locking time, when the submarine is on the surface within 5 nautical miles and in visual contact with the OCS. The submarine area is to be indicated in paragraph U of the Order Table as follows: "Submarine area West (or North or East or South)". The area reserved for VDS/MTAS ships is located on the other side of the central corridor. (See diagram.)

## (NU) CASEX C-6 DIAGRAM



4. The procedures outlined in 2 and 3 above may be altered by the use of a starred relaxation in the 14 series (see Article 2.2.37.(1).b).
5. The submarine and VDS/MTAS ships mark the central corridor on their plotting tables and remain in their respective areas using best available navigation. The central corridor is never to be locked geographically and may not be updated except under the stringent conditions used in the initial locking. If Relaxation 14\*D is to be ordered, see Article 2.2.37.(1).b.(4).
6. There are no restricted areas for non-VDS/MTAS ships.
7. The OCS is always to be aboard a VDS/MTAS ship.
8. Unless Relaxations 14\*A and 14\*D are in effect, this CASEX must not exceed 2 hours, and in areas of strong or variable tidal stream this period should be reduced.
9. Only one run is allowed.
10. Submarine radar must be operating efficiently and radar range checked.
11. The submarine area is to be a minimum of 5 miles wide.
12. The exercise is not to be conducted in visibility of less than 2000 yards. Relaxation 13\*B is not to be authorized.

**INTENTIONALLY BLANK**

## CASEX C-7

### DEFENCE OF MAIN BODY DURING OPPOSED SORTIE/ENTRY

#### (NU) PURPOSE

1. To exercise ASW forces in protecting a main body while entering or leaving port.
2. To exercise ASW ships, fixed-wing aircraft and helicopters in detecting and attacking submarines.
3. To exercise submarines in penetrating a screen and attacking a main body.

#### (NU) FORCES REQUIRED

1. One or more target ships, or a reference ship.
2. Two or more ASW ships, fixed-wing aircraft and/or helicopters.
3. One or more submarines.

#### (NU) SITUATION

1. ASW forces defend the designated sortie/entry area while submarines endeavour to penetrate the ASW screen and attack the main body.
2. All friendly forces are transiting from port to sea or vice versa.

#### (NU) PROCEDURE

1. The OSE/OCE designates the area and establishes mine fields or other constructive barriers.
2. At GO TIME, or as ordered, the submarine is to dive, remaining in assigned sortie/entry area and is to try to penetrate the ASW screen formed by the ASW ships exiting/ entering the harbour.
3. ASW units defend the main body by designated search pattern or formation.
4. Submarines penetrate the screen and attack the main body.
5. First unit gaining contact initiates COMEX.
6. Submarine goes to Safe Depth in accordance with the Safety Precautions and the relaxations in force.
7. ASW ships break off attacks 5 minutes before FINEX or STOP TIME.
8. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73, unless relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

1. Submarines are to be informed of the sortie/entry area limits and may be given information on the type of screen to be used by the ASW units.
2. If more than one submarine takes part, the Senior Submarine Commanding Officer is to coordinate attacks.
3. (NMM) NOT RELEASABLE.

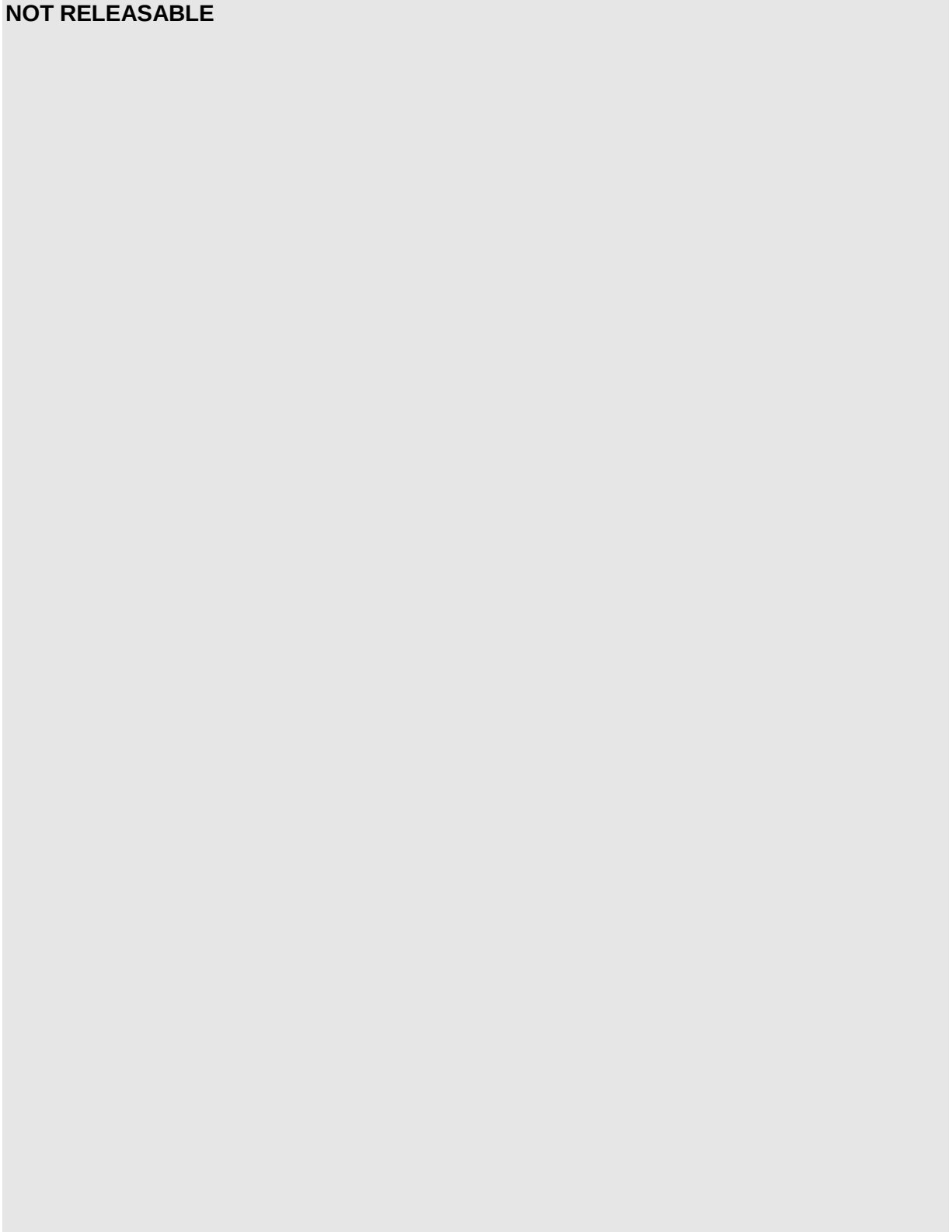
## **(NU) RECORDS**

As required.

**CASEX C-8**

**(NMM) NOT RELEASABLE**

**NOT RELEASABLE**



## CASEX C-9

### ASW FORCES AREA SEARCH FOLLOWED BY SUBMARINE ATTACK ON UNDERWAY REPLENISHMENT GROUP

#### (NU) PURPOSE

1. To exercise two or more ships, helicopters and aircraft in the conduct of ASW area search operations and detecting, attacking and counter-attacking a submarine or submarines.
2. To exercise submarines in detection, avoidance and subsequent simulated attacks on escorts and screened targets without being counter detected.
3. To exercise sonar operators in initial detection, contact classification and weapon attack procedures.
4. To heighten command and control procedures in a complex serial.

#### (NU) FORCES REQUIRED

1. Two or more ships.
2. Organic/non-organic helicopters.
3. One or more submarines.
4. A high value unit.
5. One Maritime Patrol Aircraft (MPA) (Optional).

#### (NU) SITUATION

1. For the first phase of the exercise, the submarine is to be on patrol in the allocated areas and has freedom to manoeuvre in accordance with the relevant relaxations and instructions.
2. ASW units will form up at a rendezvous position and commence the area search.
3. After the first period of ASW action is complete, units will break off attacks and go to an R/V and reform as an Underway Replenishment Group (URG).
4. Helicopters and aircraft may be left at the scene of action to maintain pressure on the submarine.
5. The URG will then steer a course along a NAV PIM, passing through the centre of the allocated area. The group must reach a specified point by a certain time.

6. Countermeasures are to be employed as authorized in the CASEX signal.
7. The submarine is to reposition itself in order to avoid detection and achieve a fire control solution.

## **(NU) PROCEDURES**

### **Phase 1 (two hours)**

1. Units conduct area search until contact is gained
2. In order to avoid submarine smoke candles from influencing the classification process, attacks may only be marked by using signal A1 during the first period of ASW action. In subsequent periods of ASW action, attacks may be marked by the appropriate signals in accordance with instructions in force.
3. COMEX is at the discretion of the OCE/OCS (normally after the final attack).
4. Duration is to be 30 minutes.
5. Relaxation's 2\*J, 3A, 3D, 3\*F and 3\*K are to be considered.
6. The submarine may carry out attacks and counter-attacks as opportunities occur.
7. Units are to break off attacks five minutes before FINEX.

### **Phase 2 (one hour)**

1. On completion of the appropriate period of ASW action, ships are to break off attacks and rendezvous with the high value unit.
2. The rendezvous position should be at least ten miles away from the last known position of the submarine.
3. During this time, the submarine is to reposition itself.

### **Phase 3 (two hours)**

1. Units form up as an URG around the HVU and the OCE/OCS orders one ship to replenish.
2. The HVU is to be screened appropriately and escorted through the submarine probability area.
3. The submarine will make its approach and carry out attacks.
4. COMEX is at the discretion of the OCE/OCS (normally after the first attack).
5. Duration of ASW action is until STOP TIME.

6. The submarine may carry out attacks and counter-attacks as opportunities occur.
7. Units are to break off attacks five minutes before FINEX.
8. At FINEX or STOP TIME, the submarine may remain submerged as long as two-way underwater telephone communications are established before the surface units leave the scene of action.

**(NU) SPECIAL PROVISIONS**

1. If more than one submarine is involved, the OSE is to ensure that they are positioned at least ten miles apart with the appropriate safety separation between their areas.
2. When more than one submarine is in the serial, any relaxations relating specifically to that submarine must refer to it by name (i.e. 12A(16)(WALRUS), 12A(18)(TALENT)).
3. A setting signal is required.

**(NU) RECORDS**

1. SUBVEC's and ME/YOU messages are required from the submarine(s) to the OCE/OCS of the serial.
2. ME/YOU messages are to be signalled to the submarine(s) by surface on completion of the serial.
3. All units in the serial are to signal their initial detection ranges and amount of time in contact to the OCE/OCS.
4. The OCE/OCS is to signal to all participating units a summary of the overall conduct of the serial. This should include:
  - a. Time, range and method of initial detection.
  - b. Approximate percentage time in contact.
  - c. Effectiveness of submarine evasion.
  - d. Comments.

**INTENTIONALLY BLANK**

## CASEX C-10

### COORDINATED PASSIVE TRACKING EXERCISE BY TAS UNITS AND AIRCRAFT

#### (NU) PURPOSE

1. To exercise command and ASW teams of TAS unit and aircraft in localizing a submarine.
2. To exercise sonar operators in classifying and tracking a submarine.
3. To exercise a submarine in evasion tactics.

#### (NU) FORCES REQUIRED

1. One or more TAS units.
2. One nuclear submarine which may be noise enhanced, or a noise enhanced conventional submarine.
3. One or more ASW air units.

#### (NU) SITUATION

1. The submarine is in the defined area at GO TIME with orders to follow a specific run plan or with the specific mission of proceeding to a given position by STOP TIME.
2. TAS unit start position is to be at a range from the submarines defined area at GO TIME greater than the predicted initial detection range.
3. At GO TIME helicopters may be airborne in the vicinity of the TAS unit or at deck alert.
4. MPA should be within radio communication range of TAS unit one hour after GO TIME.

#### (NU) PROCEDURE

1. The submarine and TAS unit are to take a satisfactory fix as close as practicable to GO TIME, ideally within 60 minutes beforehand.
2. The submarine proceeds at the specified depth (if ordered) on the ordered track, or to the given STOP TIME position.
3. The TAS unit maneuvers to gain detection and remain outside the submarine safety lane/haven if ordered.

**(NU) RECORDS**

See Article 6.3.

## CASEX C-11 INTERMEDIATE COORDINATED ASW AREA SEARCH

### (NU) PURPOSE

1. To exercise one or more ships assisted by ASW helicopters/MPA in the conduct of intermediate ASW Area Search Operations.
2. To exercise submarines in detection avoidance and subsequent simulated attack on escorts without being counter-detected.
3. To exercise sonar operators in initial detection and contact classification.

### (NU) FORCES REQUIRED

1. One or more ships assisted by ASW helicopters/MPA.
2. One submarine.

### (NU) SITUATION

Submarine is on patrol in allocated areas and has freedom to manoeuvre limited only by Table 2-2.

### (NU) PROCEDURE

1. Units conduct ASW Area Search until contact gained.
2. To avoid submarine smokes influencing the classification process, attacks are to be marked with signal A1 until completion of the first period of ASW action. In any subsequent period of ASW action, attacks may be marked by any appropriate signal.
3. Duration is to be 30 minutes or until STOP TIME.
4. Relaxations 2\*J, 3A, 3D, 3\*E, 3\*H, 3\*K are to be considered.
5. If sufficient serial time remains at FINEX, ship(s) may break off and attempt to regain contact re-establishing COMEX as required.
6. Unit(s) break off attacks 5 minutes before FINEX.
7. Submarine need not return to PD at STOP TIME.

### (NU) SPECIAL PROVISIONS

Although this CASEX is predominantly designed for surface ships, it has been written to allow submarine training as individual submarine Commanding Officers see fit. Submarine is to provoke attacks by surface forces in the final hour of the serial if no contact has been gained.

**(NU) RECORDS**

See paragraph 6.3.

## CASEX C-12

### ADVANCED CO-ORDINATED ASW EXERCISE (PROWLEX)

#### (NU) PURPOSE

1. PROWLEX is an advanced ASW exercise designed to provide additional training to submarines, surface ships and/or aircraft outside CASEX periods.
2. This CASEX is designed to:
  - a. Provide submarine attack training; and
  - b. Exercise ASW units in detecting, attacking and counter-attacking dived submarines.

#### (NU) FORCES REQUIRED

1. One or more ASW ship and helicopters.
2. One submarine.

#### (NU) SITUATION

1. There are many occasions when submarines, which are operating in exercise areas and are not carrying out specific exercises, can both provide and receive valuable training by carrying out unscheduled attacks on ASW capable ships and be attacked/counter-attacked by ASW forces.
2. PROWLEX will either be scheduled in a Schedule of Events (SOE) or in a message to the participating units from the OSE. If a message is used, it must contain the outline schedule of participating units to include serial number, time, exercise description, units involved, OCS, and exercise area. The OSE will also send the standard PROWLEX CASEX message.

#### (NU) PROCEDURE

1. During PROWLEX periods, the submarine is free to practice attacks on ships indicating that she has done so in the normal way. Similarly, ships and/or aircraft may attack and counter-attack the participating submarine.
2. The OSE is to ensure that no evolutions hazardous to submarine operations are conducted during PROWLEX periods in areas allocated to PROWLEX.
3. To avoid the possibility of carrying out PROWLEX against a non-exercise submarine, the following rules are to be observed:

- a. The contact must be at least one mile inside the exercise area.
  - b. The sighting of a green grenade/ smoke can be taken as a positive identification of a PROWLEX submarine and COMEX can be initiated by any participating PROWLEX unit. ASW action may then be started in accordance with the Standard PROWLEX CASEX Order below.
  - c. If initial contact is obtained by sonar, radar, EW or visually, the detecting ship is not to approach within 1200 yards (or 4000 yards if VDS is streamed) until the contact has been positively identified as the nominated PROWLEX submarine. This identification is not to be attempted until the contact has been classified "POSSUB High 3" or higher and is to follow the "Uncle Joe" procedures specified at Article 5.21. Once the contact has been established as the nominated PROWLEX submarine ASW action may be commenced in accordance with the Standard PROWLEX CASEX Order below.
4. Ships and/or aircraft may break off their scheduled SOE serial at the OTC's discretion to attack or counter-attack submarine contacts.
  5. Submarines may, on occasions, use radar before attacking. EW operators should, therefore, be alert during PROWLEX periods.

## **(NU) SPECIAL PROVISIONS**

1. It is emphasized that Exercise PROWLEX can only be ordered with the prior approval of the relevant national SUBOPAETH and OPCON authority.
2. Once approved by SUBOPAETH and OPCON authority, unless otherwise directed, the following standard PROWLEX CASEX Order is to be used:
  - A. PROWLEX CASEX C12
  - B. OSE
  - D. OTC
  - E. OCS
  - F. FRNFOR
  - G. OPFOR
  - H. Zone Time
  - J. GO TIME
  - JJ. STOP TIME
  - K. For one hour or to the end of the current PROWLEX period, whichever is the shorter
  - KK. Out of action period (Submarine not available for PROWLEX)
  - L. Assigned Area
  - P. Safety Course
  - Q. 2\*B, 2D, 2G, 2L, 3A, 3D, 4\*E, 5J, 7\*C, 8\*B (60m), 8D (60m), 9D(A), 10\*A, 11A
  - T. 140, 141, 149F, 150, 158, 323, 401, 508, 513, 605
  - U. (1). Relaxation 4\*E is only in force after the PROWLEX submarine has been positively identified.

- (2). To avoid possible damage from green grenades, aircraft are to be above 50 feet unless they are helicopters going into or breaking dip, or dipping.
- X. 3 - 4

## **(NU) RECORDS**

As required.

**INTENTIONALLY BLANK**

**CASEX D-1**

**(NMM) NOT RELEASABLE**

**(NMM) NOT RELEASABLE**

**CASEX D-2**

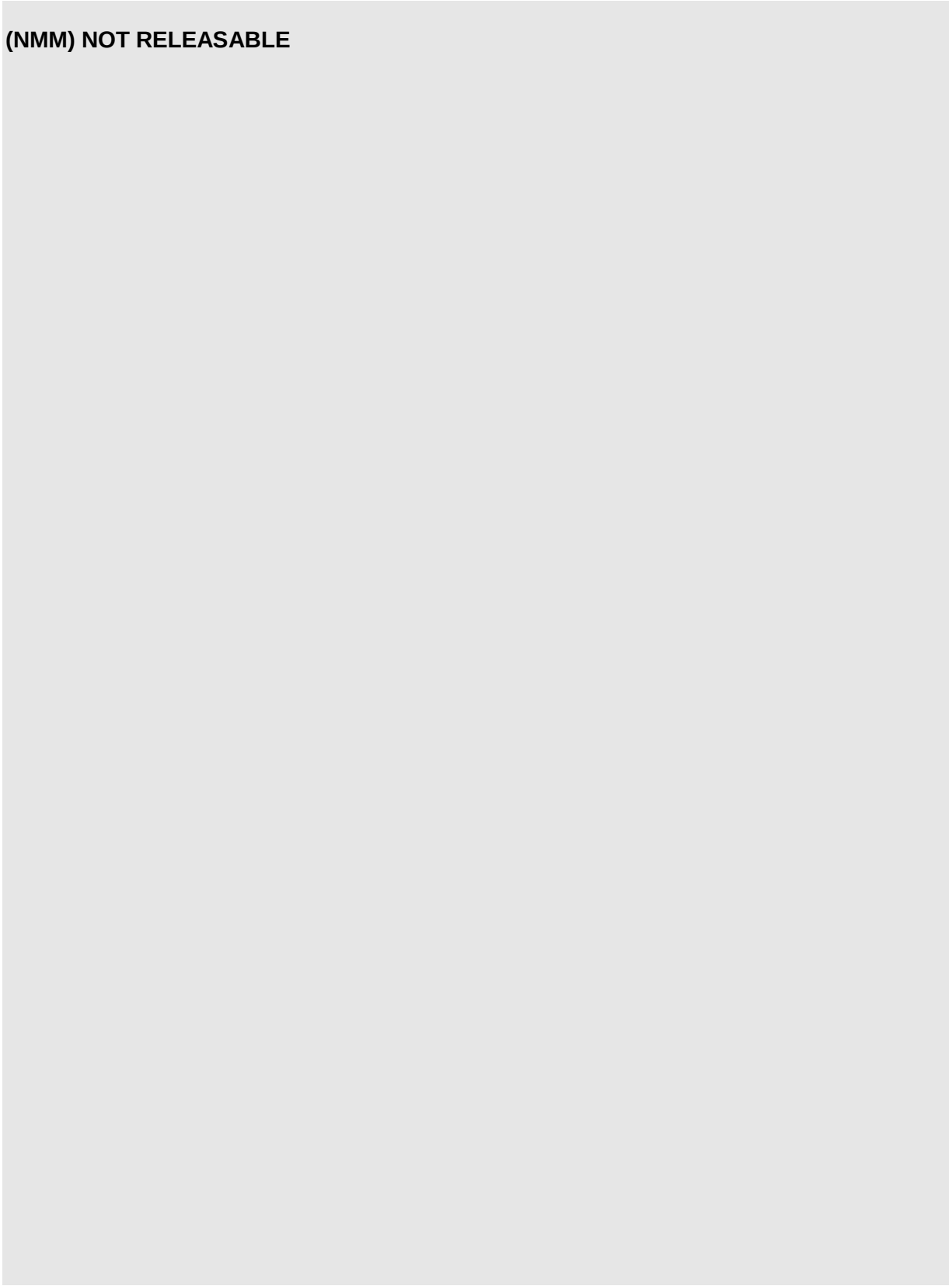
**(NMM) NOT RELEASABLE**

**(NMM) NOT RELEASABLE**

**CASEX D-3**

**(NMM) NOT RELEASABLE**

**(NMM) NOT RELEASABLE**



**CASEX D-4**

**(NMM) NOT RELEASABLE**

**(NMM) NOT RELEASABLE**

**CASEX D-5**

**(NMM) NOT RELEASABLE**

**(NMM) NOT RELEASABLE**

## CASEX E-1 FAMILIARIZATION - SUBMARINE AND ASW UNITS

### (NU) PURPOSE

1. To familiarize personnel in recognizing a submarine maneuvering on the surface and dived exposing masts and equipment in accordance with the program.
2. To provide basic acoustic recognition training of submarine active sonar intercepts.

### (NU) FORCES REQUIRED

1. One submarine.
2. One or more ASW ships and/or helicopters.
3. One to three fixed-wing aircraft.

### (NU) SITUATION

1. The submarine is on the surface by day, at rendezvous.
2. Ships maintain station on the submarine throughout the exercise and are not to approach closer than 500 yards to the submarine.
3. Aircraft join the submarine at rendezvous, at ordered altitude.

### (NU) PROCEDURE

1. Establish communications and conduct time check prior to GO TIME.
2. OTC/OCS designates Zero Time and Base Course.
3. Submarine steers Base Course and conducts the program appropriate to participating ASW units. (Annex A or Annex B to this CASEX.)
4. Annexes A and B are for guidance and may be altered mutually by the OTC/OCS and the submarine Commanding Officer.
5. The exercise terminates with the submarine on the surface.

### (NU) SPECIAL PROVISIONS

1. Annexes A and B are for guidance and may be altered mutually by the OTC/OCS and the submarine Commanding Officer.
2. Paragraph 'A' of the Order Table should indicate which program is to be conducted (e.g. A. CASEX E-1 (SHIPS)).

3. The following action should be taken:
  - a. Sonar operators should be listening for/to submarine HE.
  - b. ESM operations should man equipment to intercept radar transmissions.
  - c. Opportunity should be taken to allow the maximum number of personnel to observe the submarine's activities. Where possible, a running commentary should be given.
  - d. The ASW ACINT teams should be exercised and full analysis undertaken of submarine acoustics.

**(NU) RECORDS**

Not Required.

## CASEX E-1

### ANNEX A (NU) - SHIP PROGRAMME

| Time (min) | Action by Submarine                                                                                                                    |
|------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Zero (Z)   | Dive - Show attack periscope.                                                                                                          |
| Z plus 5   | Show search periscope. Lower attack periscope.                                                                                         |
| Z plus 7   | Show ESM mast.                                                                                                                         |
| Z plus 9   | Show snorkel mast(s). Lower ESM mast. Leave search periscope and snorkel mast(s) up for remainder of exercise.                         |
| Z plus 11  | Show radars.                                                                                                                           |
| Z plus 13  | Show communications masts.                                                                                                             |
| Z plus 15  | Show all masts and periscopes.                                                                                                         |
| Z plus 17  | Fire a white smoke/flare.                                                                                                              |
| Z plus 18  | Fire a yellow smoke/flare (grenade).                                                                                                   |
| Z plus 19  | Fire a green (black) smoke/flare (grenade).                                                                                            |
| Z plus 21  | Commence snorkeling.                                                                                                                   |
| Z plus 22  | Transmit on search radar (all round). Commence transmissions on active sonar.                                                          |
| Z plus 24  | Transmit on search radar (sector scan at each ship in formation).                                                                      |
| Z plus 26  | Transmit on periscope radar (several transmissions at each ship in formation).                                                         |
| Z plus 28  | Stop snorkeling. Lower all masts except search periscope. Cease transmissions on active sonar. Commence transmissions on echo sounder. |
| Z plus 30  | Surface. *After surfacing, submarine fires a red smoke/flare (grenade). Cease transmissions on echo sounder.                           |

\*This is the only occasion on which a submarine is authorized to fire a red pyrotechnic except in emergency. Firing a red smoke/flare is not allowed when confusion with a real emergency can arise.

**INTENTIONALLY BLANK**

## CASEX E-1

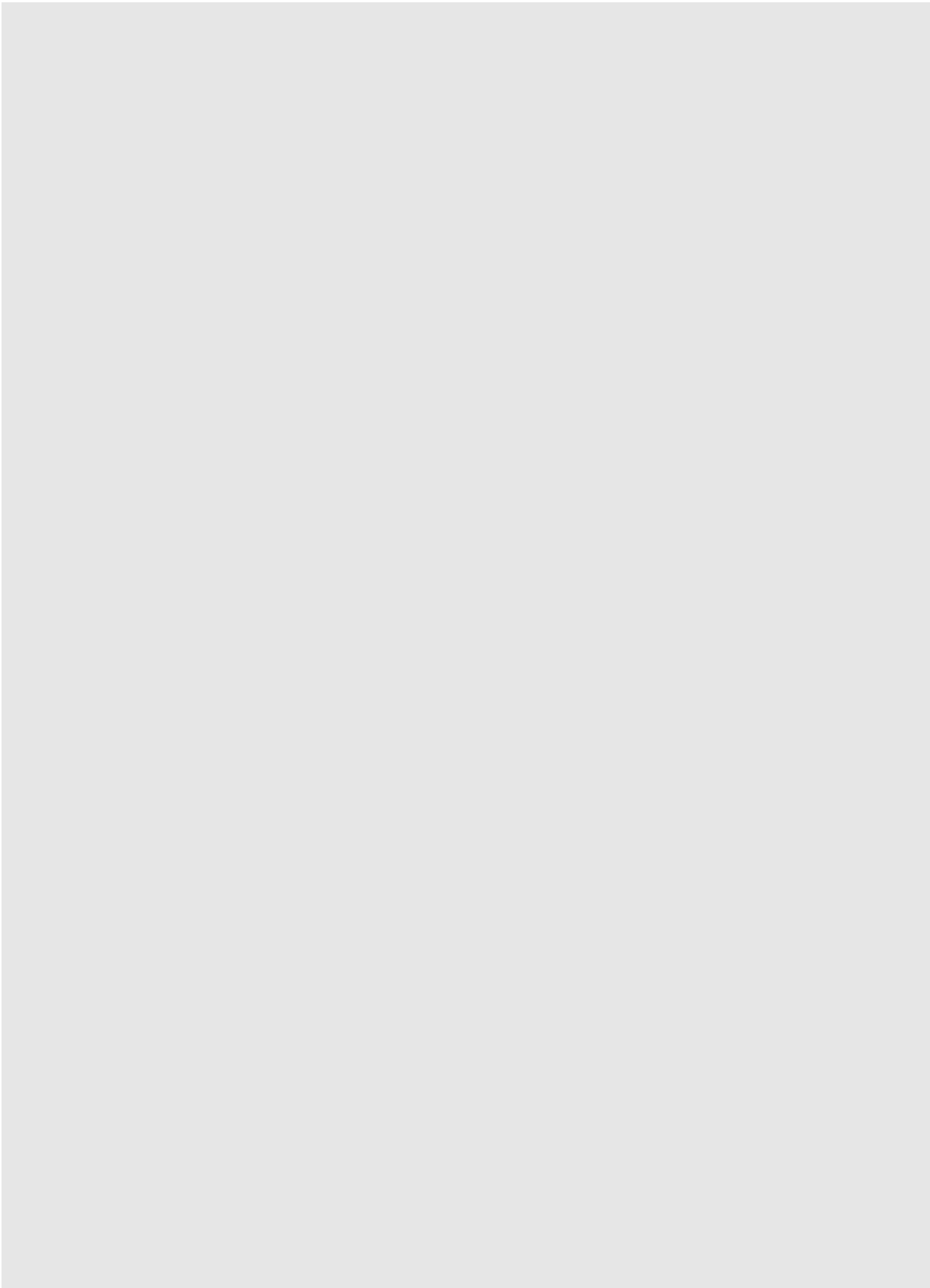
### ANNEX B (NU) - AIRCRAFT PROGRAMME

| Time (min) | Action by Submarine                                                                                                                           |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Zero (Z)   | COMEX. On surface at rendezvous.                                                                                                              |
| Z plus 2   | Proceed on Base Course at 5 knots.                                                                                                            |
| Z plus 5   | Increase to maximum surface cruising speed.                                                                                                   |
| Z plus 8   | Manoeuvre at maximum speed and steer:<br>(1) Into (up) sea;<br>(2) Across Sea; and,<br>(3) Down sea.                                          |
| Z plus 17  | Dive on Base Course.                                                                                                                          |
| Z plus 19  | Take evasive action below periscope depth and release pyrotechnics, air and dye markers at intervals. Commence transmissions on active sonar. |
| Z plus 23  | Cease transmissions on active sonar. Commence transmissions on echo sounder.                                                                  |
| Z plus 24  | Cease transmissions on echo sounder.                                                                                                          |
| Z plus 25  | Return to periscope depth on Base Course at minimum speed, exposing periscopes for periods of 30 seconds.                                     |
| Z plus 30  | Increase speed to 6 knots, continue exposing periscope for periods of 30 seconds.                                                             |
| Z plus 33  | Expose periscope continuously. Alter course 90 degrees to starboard.                                                                          |
| Z plus 36  | Alter course 90 degrees to port.                                                                                                              |
| Z plus 40  | Reverse course.                                                                                                                               |
| Z plus 45  | Commence snorkeling at slow speed.                                                                                                            |
| Z plus 55  | Increase to maximum snorkeling speed.                                                                                                         |
| Z plus 58  | Alter course 90 degrees to starboard.                                                                                                         |
| Z plus 61  | Alter course 90 degrees to port.                                                                                                              |
| Z plus 70  | Surface trimmed down.                                                                                                                         |
| Z plus 75  | Proceed on surface trimmed down, steering:<br>(1) Into (up) sea;<br>(2) Across sea; and<br>(3) Down sea.                                      |
| Z plus 85  | Surface fully. FINEX.                                                                                                                         |

**INTENTIONALLY BLANK**

**CASEX E-2**

**(NMM) NOT RELEASABLE**



## CASEX E-3

### MUTUAL SENSOR EXERCISE

#### (NU) PURPOSE

1. To train lookouts, radar, ESM and sonar operators in detecting and tracking a submarine.
2. To train submarines in obtaining Fire Control data.

#### (NU) FORCES REQUIRED

1. One or more ASW ships.
2. Ships are in assigned sectors.
3. One Submarine.

#### (NU) SITUATION

1. Submarine on the surface, or snorkeling, or at periscope depth.
2. Ships are in assigned sectors.

#### (NU) PROCEDURE

1. Establish communications prior to GO TIME.
2. Ships take station as ordered by OTC/OCS.
3. Submarine reports to OTC/OCS when ready to proceed with the exercise.
4. OTC/OCS orders the submarine to proceed as required.
5. Submarine carries out the exercise at depth, course and speed ordered.
6. Ships vary course, speed and range from the submarine to determine maximum detection ranges (closing and opening) of all sensors.
7. While the submarine is obtaining Fire Control data, and when requested, ships pass the required information using the ME-YOU method (Article 6.4).
8. Submarine surfaces at STOP TIME.

#### (NU) SPECIAL PROVISIONS

1. The submarine is never to be approached closer than 1000 yards by day or 1500 yards by night.
2. If forced deep at any time, the submarine is to carry out full surfacing procedure in accordance with Article 2.2.73, unless Relaxations in force permit otherwise. If desired, the exercise may be restarted after the submarine has returned to periscope depth.
3. Relaxation 13\*B is not to be ordered.

## **(NU) RECORDS**

ME-YOU Message.

## CASEX E-4

### ASW ACTION AGAINST BOTTOMED SUBMARINE OR TARGET

#### (NU) PURPOSE

1. To train sonar operators in locating, holding and classifying a bottomed or hovering submarine, or target.
2. To train ASW teams in attacking a bottomed submarine or target.

**Note.**

*A known wreck may be used as a target.*

#### (NU) FORCES REQUIRED

1. One or more ASW ships or helicopters.
2. One submarine or target.

#### (NU) SITUATION

1. Initially, submarine is on the surface or at periscope depth in visual contact with ASW units.
2. ASW units are stationed outside sonar range from the submarine or bottomed target.

#### (NU) PROCEDURE (when a submarine is participating)

1. Establish communications prior to GO TIME.
2. Submarine reports "Ready".
3. OTC/OCS orders submarine to dive.
4. Submarine dives and bottoms, or hovers at Safe Depth.
5. When bottomed or hovering at safe depth, the submarine reports by UWT, SST or pre-arranged pyrotechnics.
6. ASW units carry out exercise.
7. When contact has been gained, ASW units initiate COMEX.
8. ASW units break off attacks five minutes before FINEX or STOP TIME.
9. At FINEX or STOP TIME, submarine is to be surfaced in accordance with Article 2.2.73 unless Relaxations in force otherwise permit.

## **(NU) SPECIAL PROVISIONS**

Submarines are to bottom only in a designated safe bottoming area.

## **(NU) RECORDS**

Not required; but after surfacing the submarine is to report its heading while it was bottomed (or hovering).

## CASEX E-5 EXERCISE IN SEARCHING AND LOCALISATION FOR A SIMULATED SUBMARINE IN DISTRESS (SMASHEX)

### (NU) PURPOSE

To exercise Search forces in conducting Search and Localization Operations for a distressed submarine.

### (NU) FORCES REQUIRED

1. The scope of the exercise will depend on the forces available. Any of the following may take part:
  - a. One submarine to simulate the Distressed Submarine, hereinafter referred to as the DISSUB.
  - b. One or more submarines to assist in searching.
  - c. Two or more ASW ships.
  - d. One or more fixed wing aircraft.
  - e. One or more ASW helicopters.

### (NU) SITUATION

1. This exercise envisages and simulates a situation in which an incident has occurred. Ships and aircraft(s) from the Search Force proceed to search for the DISSUB in accordance with the current doctrine for submarine search and rescue (ATP-10, ATP-57 and/or National Instructions \*).
2. The DISSUB's bottoming position is to be ordered beforehand. It is to be given a double letter reference (for example, KK) and is to be referred to as such in all messages. The DISSUB is to report its position in the diving message as a bearing and distance from the lettered position. It has to dive within two miles from this position.
3. The datum position given to the searching force may be up to 20 miles from the target submarine's actual bottoming position.
4. Depending on the type of exercise, ships and submarines of the searching force may be either in harbour or at sea at the start of the exercise. If at sea, the searching force should be more than two hours steaming from the datum.
5. Depending on the type of exercise, aircraft and/or helicopters may be either available at their bases or actually airborne.

## (NU) PROCEDURE

1. The exercise is given the code name SMASHEX to facilitate message processing in accordance with ATP-10/ATP-57\* (see note at the end of Chapter 2).
2. The code word SMASHEX is to be included at the beginning of the text of all messages concerning the exercise, except maneuvering signals.
3. Although GO TIME will have been included in the Exercise Message, the exercise is not to start until the DISSUB has made its diving message, and the OCE has sent a message authorizing forces to proceed.
4. The DISSUB is to dive and bottom in the ordered position at GO TIME, releasing an indicator/messenger buoy as ordered. (Time of release to be specified by OCE.)
5. The DISSUB commences releasing smoke candles/flares; the number to be fired and the rate of firing will be dictated by the number available, or as ordered.
6. On receipt of the message authorizing the start of the exercise, search forces are to assemble and proceed to the search area as ordered.
7. The methods of searching and the action to be taken on locating the DISSUB are to be in accordance with current doctrine.
8. Exercise Completed
  - a. The On Scene Commander (OSC) is to report "Exercise Completed" to the OCE after consideration of whether:
    - (1) UWT communication has been satisfactorily established with the DISSUB;
    - (2) ASW ships have located and classified the DISSUB;
    - (3) All ships and aircraft have had an opportunity of sighting the indicator buoy, and/or have had a sonar contact with the submarine;
    - (4) All ships have converged on the position of the DISSUB and made full arrangements for the rescue and treatment of survivors as coordinated by the OSC.
  - b. The exercise should also be terminated:
    - (1) If the DISSUB has not been located within 30 minutes of STOP TIME; or
    - (2) If it is considered that no further value can be obtained from the exercise; or

- (3) When the OSC has surfaced the DISSUB, seen it surface, or heard it report "Surfaced."
9. The following methods are to be employed to surface the DISSUB:
- a. The OSC is to order one ship or submarine to surface the DISSUB using Signal A5.
  - b. If the DISSUB has not been located by STOP TIME, it is to surface, using Signal B1.
  - c. If either of the above signals are made, or five minutes before STOP TIME, ships and submarines employed in the search are to comply with Article 2.2.73, unless Relaxations in force otherwise permit.
10. The DISSUB is to surface at STOP TIME or as ordered by the OSC and send its SURFACED message.
11. On receipt of the SURFACED message, the OCE is then to send the message "SMASHEX Completed."

## (NU) SPECIAL PROVISIONS

1. The exercise is to be ordered by message, referring to the Order Table (Table 3-1), modified as follows:
- D OSC
  - JJ STOP TIME (should nor normally be more than 12 hours after GO TIME)
  - M Datum Position for Search. (The Target Submarine's actual diving position is given only to the submarine and to the OSC in a sealed envelope.)
  - U Should include the following:
    - a. whether a Basic or Advanced exercise, and
    - b. whether Medical or Salvage organizations are to take part.
2. Depending on the standard of training required, this exercise can be conducted either as:
- a. A basic exercise to practice the search procedures involved (in which case, notification of the exercise may be included in normal training programs); or as
  - b. An advanced exercise to test the capability of the command and forces available to carry out SUBMISS/SUBSUNK procedures in as realistic a manner as possible. (In this case, the exercise would be announced at short notice.)
3. Before the exercise, the DISSUB should be informed which compartments are considered to have been flooded. From the moment of bottoming, no equipment from the flooded compartments is to be used for indicating the DISSUB's position. The use of SST will also be dependent on the compartments available.

4. No messages organizing the searching force are to be made until the exercise has started. The Search and Rescue Authority (SSRA) is then to conduct the exercise, ordering the OSC to take charge at sea as appropriate.
5. Oil is not to be discharged unless specified in the Exercise Orders.
6. If the indicator buoy should fail to surface, a second buoy may be released for test purposes after the DISSUB's position has been established.
7. The indicator buoy is to be recovered on completion of the exercise and, if recovered by a surface ship, should be returned to the DISSUB's as soon as practicable.

## **(NU) RECORDS**

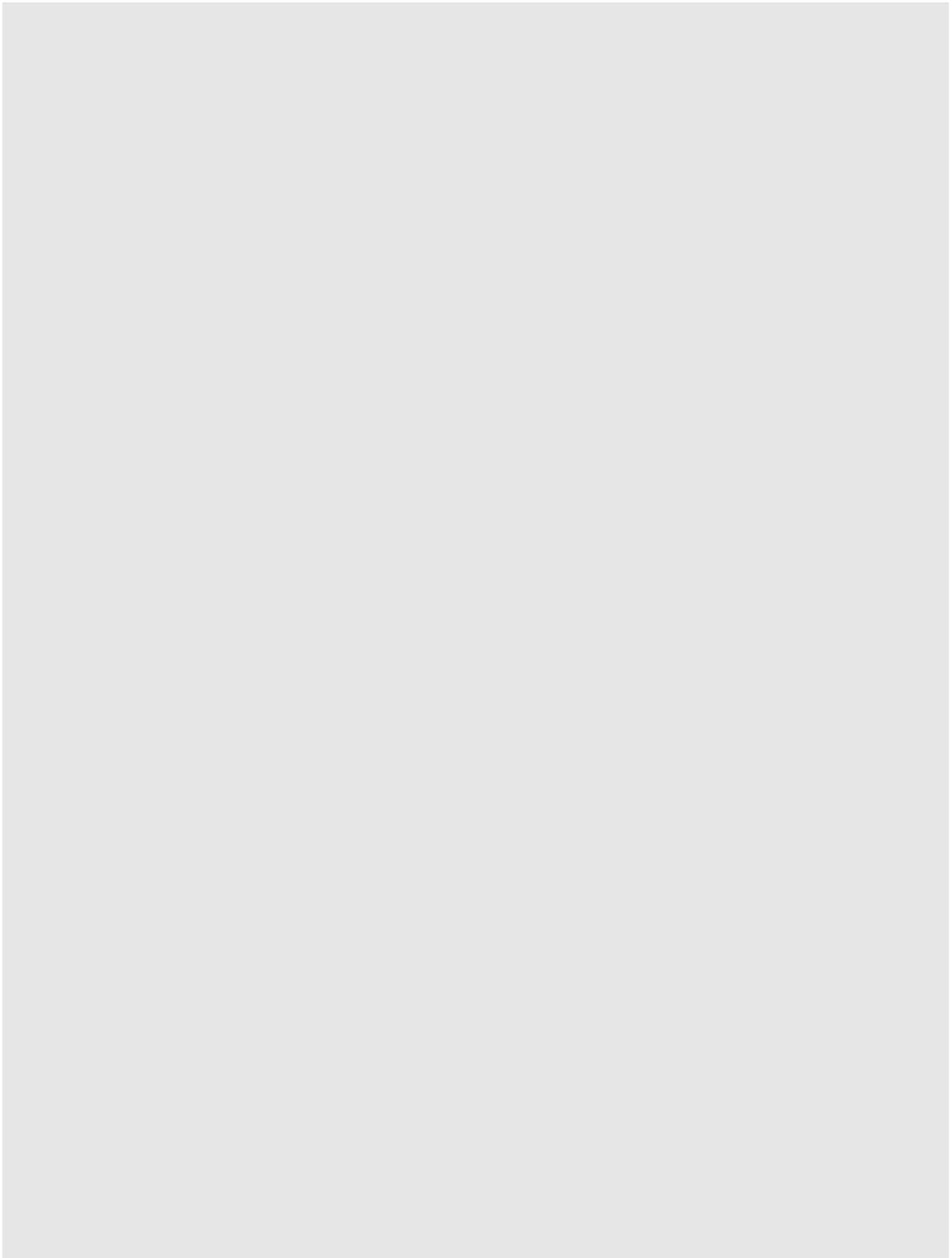
A detailed narrative report is to be forwarded to the SSRA by all participating forces. Any other records, as required.

### **Note.**

*\* ATP-57 takes precedence for the conduct of submarine rescue operations. ATP-10 remains a search and rescue document in general.*

**CASEX E-7**

**(NMM) NOT RELEASABLE**



## CASEX E-8

### HELICOPTER DELIVERED DEPTH CHARGE EXERCISE (By DAY Only)

#### (NU) PURPOSE

To give submarine crews experience in the effects of a depth charge exploding in the vicinity.

#### (NU) FORCES REQUIRED

1. One submarine.
2. One helicopter with authorized Depth Charge.

#### (NU) SITUATION

1. Approval has been obtained from National SUBOPAETH.
2. Water for the drop of a Depth Charge has been allocated.
3. Submarine and helicopter rendezvous and establish communications.
4. Submarine is at periscope depth. Steering directly into wind at slow speed.
5. Helicopter releases smoke marker at agreed stand-off range (normally 500 yards). Helicopter then climbs to release altitude and increases to release speed.
6. Helicopter then releases depth charge directly over smoke marker while flying directly into the wind, parallel to the submarine track, thus maintaining stand-off range.
7. The submarine need not surface at the end of the exercise but is to report all well within 5 minutes of detonation.

#### (NU) PROCEDURES

1. At rendezvous the submarine signals his course and speed to the helicopter; the course is to be directly into the wind and the speed is to be less than 6 knots.
2. The helicopter assumes a hover 500 yards (or the stand-off range as promulgated in the CASEX standard orders) on the beam of the submarine. The helicopter is to pass his hover height and his overall height to the submarine at the rendezvous (if not signalled beforehand) to allow periscope ranging. The hover should normally be at an altitude of about 40 feet. The helicopter should operate radar (if fitted).
3. When stand-off range of 500 yards is mutually agreed the helicopter is to release a smoke marker.

4. The submarine signals ready.
5. The helicopter will then break hover, increase altitude to the release height (normally 500 feet) and increase to a ground speed of 90 knots while conducting a retiring turn.
6. The helicopter then manoeuvres to over-fly the smoke marker at an altitude of 500 feet, ground speed of 90 knots while flying directly into the wind on a course parallel to that signalled by the submarine. of run has been signalled
7. On over-flying the smoke marker the helicopter releases the authorized depth charge.
8. The accuracy of the drop depends entirely upon the ability of the helicopter to maintain the signalled course, ground speed of 90 knots and an altitude of 500 feet and to over-fly the smoke marker. Articles.
9. Altitude 500 feet and ground speed 90 knots are invariably to be used to comply with air-dropped ordnance regulations and to provide a fixed forward throw to ensure that the charge explodes on the beam of the submarine.
10. The submarine need not surface after the depth charge has exploded but is to report within 5 minutes that all is well. The exercise terminates when the submarine has reported or is on the surface.
11. Example helicopter true heights (from bottom of hull to top of the rotor hub) are:

UK Merlin 5.24m (17 feet 3 inches)

UK Lynx 2.97m (9 feet 9 inches)

**(NU) SPECIAL PROVISIONS**

1. This exercise requires the approval of the National SUBOPAUTH.
2. This exercise requires water suitable for the dropping of live ordnance to be allocated.
3. This exercise may only take place in calm weather, in good visibility. Cloud base is not to be below 600 feet.
4. Depth Charges are not to be armed until:
  - a. The submarine has signalled ready.
  - b. The helicopter has achieved the release course, altitude and ground speed.
5. Helicopters carrying live weapons are not to over-fly submarines.
6. The stand-off range is normally to be 500 yards. Any change to this requires the approval of the SUBOPAUTH.

**(NU) RECORDS**

No records required.

**INTENTIONALLY BLANK**

## CASEX F-1

### BASIC SIMULATED ANTI SUBMARINE WARFARE EXERCISE LINK EXERCISE (LINKEX)

#### (NU) PURPOSE

Train basic ASW procedures (SAU procedures and close ASW action) when no submarine is available

#### (NU) DURATION

Three hours

#### (NU) EXECUTION

1. A unit providing threat simulation (TSU) (position, course and speed of the synthetic submarine by voice or link) is to be assigned by the OCE. This unit will also provide elements for the classification process.
2. The OCE promulgates a DATUM and designates a SAU, a SAU approach is to be executed and once units are within range, the TSU provides information concerning the position (bearing and range relative to each unit), course and speed of synthetic submarine. This information is plotted or, when available, fitted into the sonar simulation system.
3. Plans BLACK and RED are to be executed.
4. Once attack criteria are met, weapon co-ordination and simulated weapon engagements are to be executed.
5. A simulated HELO/MPA or a HELO in flight conducting simulated ASW operations (sonar operator on threat simulation circuit) may be introduced for initial DATUM search, training of SWAP procedure and stand-off attacks.
6. During the approach the TSU is to provide EW/riser info, forcing DATUM/ETA-TDA updates and SAU manoeuvring. Furthermore the TSU may initiate counter attacks by the synthetic submarine to provoke TCM's.
7. This exercise can be executed with ships manoeuvring or static (in harbour).
8. Duties of the OCE:
  - a. Provide a scenario (including sonar detection ranges);
  - b. Assign a TSU; and
  - c. If required, assign a unit simulating a HELO/MPA.

9. Duties of the OCS:
  - a. Act as ASWC/FTC/EWC/ACU; and
  - b. Assign data link, threat simulation and coordination circuits.

## CASEX F-2

### SIMULATED ANTI SUBMARINE WARFARE EXERCISE

#### (NU) PURPOSE

1. To exercise advanced ASW procedures when no submarine or MPA is available. The following is to be practiced:
  - a. MPA joining procedures.
  - b. SAU procedures.
  - c. Stand-off conventional and close ASW action.

#### (NU) DURATION

Approximately three hours

#### (NU) EXECUTION

#### (NU) SUBMARINE AND MARITIME PATROL AIRCRAFT

1. One ship takes station 15 nm ahead of the force. This ship will represent the submarine target. The target ship is limited to a maximum speed of 18 knots.
2. The target ship's helicopter (if carried) is to be used to simulate the MPA.
3. Other ships are not to take tactical advantage of the targets ship's radar echo, except as provided for in paragraphs C.5 and E.1 below.

#### (NU) MAIN BODY AND SCREEN

1. The OCS will signal the OPGEN for the serial, designating one ship as the main body, and a screen commander. The screen commander will form a screen around the main body.
2. The screen commander will detach a SAU based on the information from the MPA after full MPA joining procedures have been carried out.
3. Once a SAU has been detached, the ship representing the main body, may be diverted by the screen commander. It should continue to act as a merchant ship to give the target submarine opportunity to evade the SAU and press home his attack. Alternatively, the main body can be detached and "leapfrogged" ahead as the OCS of another serial to follow.

## (NU) MARITIME PATROL AIRCRAFT

1. Full MPA joining procedures can be exercised if desired. This should be done before the SAU is detached.
2. If the helicopter simulating the attack is not IFF equipped, a suitable radar responder can be used.
3. Once the joining procedure has been completed, the MPA will initiate the detection of the submarine as a JEZEBEL or radar contact.
4. The actual radar echo of the target *must not* be plotted. To assist realism, MPA may report an incorrect grid position, such as could occur in the event of an inaccurate gridlock on joining.
5. Radar on top of KINGPIN or target position can be exercised using actual radar echo as the on-top position. The plot may then be marked but further movement of the target radar echo must be disregarded.

## (NU) SEARCH ATTACH UNIT

1. Full SAU procedures, including ETA at TDA, submarine's limiting courses, and Plans Red and Black are to be practiced.
2. Ships in the SAU are to disregard the target's radar echo, except when the MPA marks on top.
3. SWAP is to be executed with the MPA at an appropriate moment.
4. Active and/or passive sonar is to be used to search for and track target ship.

## (NU) ATTACKS

1. Once the SAU has gained sonar contact with the target, simulated stand-off attacks, using the appropriate Plan Red, may be carried out with helicopters or other stand-off ASW weapon systems. Helicopters may simulate either a torpedo or a nuclear depth charge load-out. In the event of poor sonar conditions, the OCS may order the SAU to use the target radar echo for attacks.
2. If desired, a close ASW action by no more than two ships at a time may be ordered using Plan Red 3A (Geographic Sector).

## (NU) SAFETY

1. No air-dropped weapons are to be released.
2. No surface-launched weapons may be fired except "air-shots".

3. In a close ASW action, the rules of the road are to be obeyed and no ship is to close within 600 yards of the targets.
4. The target ship is to man the SAU/fighting net and if she at any time is in doubt of her safety, she is to broadcast the message "break off" three times (i.e. "Break-off, Break-off, Break-off), which means that all ships immediately stop the exercise and act in accordance with the International Rules for Preventing Collision at Sea. If the message "Break-off" has been broadcast, only the OCS can order continuation of the exercise.

## **(NU) METHOD OF ORDERING**

The OCS will send a CASEX order message and the appropriate OPGEN/ OPTASK supplement as required.

## **(NU) UMPIRING**

The target ship is to monitor all tactical circuits and is to report on the performance of the SAU and other relevant comments.

## **(NU) DEVELOPMENT**

1. Further development of the SYNTEX can be made as follows, if the basic procedures are successful and safe:
  - a. The target ship can be designated nuclear and be unrestricted in speed. Course restrictions must be applied at speeds greater than 18 knots for safety reasons.
  - b. The distance to the target must not be less than 3000 yards to provide greater difficulty for sonar operators.

**NATO UNCLASSIFIED**

**INTENTIONALLY BLANK**

**NATO UNCLASSIFIED**

## CHAPTER 4

### INSTRUCTIONS, DEFINITIONS, SAFETY RULES AND PROCEDURES APPLICABLE TO SUBMARINE ASW EXERCISES - COORDINATED SUBMARINE OPERATIONS - "S" SERIES

#### 4.1 INSTRUCTIONS FOR SUBMARINE ASW EXERCISES

#### 4.2 PURPOSE

(NU) The purpose of conducting submarine ASW exercises is to train the Commanding Officer and the attack team of a submarine in detecting, classifying, tracking and attacking submarine targets.

#### 4.3 MINIMUM REQUIREMENTS FOR PARTICIPATING SUBMARINES

4.3.1. (NU) The following are the minimum requirements for submarines participating in ASW exercises:

- a. Sonar. All participating Submarines must be capable of reliable underwater communication with each other, either by underwater telephone (UWT) and/or SST. Should any submarine be unable to communicate, it must surface and assume an "Out-of-Action" status until the equipment is serviceable
- b. Radar. All participating Submarines should be fitted with serviceable warning radars. The range index error of the radar must be accurately known.

#### 4.4 WHEN EXERCISES MAY BE CONDUCTED

(NU) Unless otherwise specified in the Special Provisions for individual CASEXes, these exercises may be conducted either by day and/or night.

#### 4.5 RECORDS

4.5.1. (NU) When submarine ASW exercises are to be analyzed, the following records, additional to those required by National authorities, may be requested by the designated analyzing authority.

- a. **From the Attacking Submarine**
  - (1) Attack form.
  - (2) Navigational plot (scale 1,000 yards: 1 inch).
  - (3) Attack log.
  - (4) Tracing of the time bearing plot.

(5) Contact Evaluation Plot (CEP).

**b. From the Target Submarine**

(1) Navigational plot (scale 1,000 yards: 1 inch).

(2) Containing depth, course, and speed for each incident.

(3) Contact Evaluation Plot (CEP).

4.5.2. (NU) For advanced or large-scale exercises, submarines may be required to forward the appropriate FORMEXes.

4.5.3. (NU) When torpedoes are fired, complete attack and firing data are required by the analyzing authority.

## **4.6 INTELLIGENCE BASED ON SAFETY SIGNALS**

(NU) Intelligence gained from any of the safety signals required in submarine ASW exercises is not to be used for attack or evasion by any of the participating units.

## **4.7 - 4.9 Spare**

## **4.10 DEFINITIONS APPLICABLE TO SUBMARINE ASW EXERCISES**

(NU) The following definitions are particularly applicable to submarine ASW exercises.

### **4.11 MARKED SUBMARINE**

4.11.1 (NU) A marked submarine is a submarine which proceeds at least 1 meter (3 feet) less than the optimum periscope depth for the prevailing conditions with all masts and periscopes fully extended. Should there be any doubt as to the visibility of the extended masts, a large red flag (BRAVO) is to be attached to one of the masts.

4.11.2. (NU) A submarine may be ordered to be the 'marked submarine' in exercises where both the attacking and target submarines are at periscope depth throughout, or during part of, the exercise. (See Exercise Instructions 160 and 161.)

### **4.12 RESPONSIBLE SUBMARINE**

(NU) In submarine ASW exercises, the responsible submarine is the submarine responsible for taking action to avoid a submerged collision.

### **4.13 SAFETY BEARING**

(NU) The safety bearing is the bearing of the target from the attacking submarine at the start of each Run.

### **4.14 SAFETY CIRCLES**

4.14.1. (NU) A safety circle drawn with its centre being the initial position of an attacking submarine at the start of each Run. Two concentric circles are drawn on the plots of the attacking and target submarine and called inner and outer safety circles.

4.14.2. (NU) The radii of the safety circles may be altered at the discretion of the SUBOPAETH (Relaxation 24\*A). The **minimum radii** must conform to the following:

- a. The inner safety circle is **never** to be less than **3000** yards; and
- b. The outer safety circles must be at least **2000** yards greater than the radius of the inner safety circle.

4.14.3. (NU) A special Safety Circle exists for use in CASEX S4 (Article 4.22.3).

## 4.15 SAFETY LINE

(NU) A safety line is a line drawn perpendicular to the safety bearing, at the range specified in the exercise orders/message (Relaxation 23A), from the initial position of the attacking submarine. This range is **never** to be less than **2000** yards.

## 4.16 SAFETY ZONES

(NU) Safety zones are zones established on either side of a transit lane. The width of the safety zones is to be specified in the exercise orders/message.

## 4.17 TOO CLOSE

(NU) Throughout submarine ASW exercises, if the attacking and target submarines are at periscope depth they are too close when the range is less than 1500 yards and the distance off track is less than 800 yards. (These limits may be reduced at the discretion of the national SUBOPAETH by the use of Relaxation 25\*A.)

## 4.18 TRANSIT LANE

(NU) A transit lane is a lane between transit positions in which the target submarine has complete freedom of action **except** when restricted for depth. The lane width is to be specified in the exercise orders/message.

## 4.19 TRANSIT POSITIONS

(NU) Transit positions are positions specified in the exercise orders/message, which provide the centre line of a transit lane.

## 4.20 SAFETY RULES FOR EXERCISES INVOLVING MORE THAN ONE SUBMARINE

4.20.1. (NU) The following Articles are the rules which apply for the Prevention of Collision between submerged submarines, and are applicable to all submarines.

4.20.2. (NU) The OTC/OCS is responsible for promulgating the Safety Instructions to all participants in submarine ASW exercises.

4.20.3. (NU) When submarines are conducting coordinated operations, the OTC/OCS shall promulgate the Safety Instructions.

4.20.4. (NMM) NOT RELEASABLE.

4.20.5. (NU) Delegation of responsibility for promulgation of the Safety Instructions does not in any way relieve the Commanding Officers of participating submarines of their individual responsibility for the safety of their own commands.

#### 4.21 RESPONSIBILITY FOR AVOIDING SUBMERGED COLLISION

4.21.1. (NU) In submarine ASW exercises, both the attacking and the target submarine are equally responsible for target action to avoid a submerged collision.

4.21.2. (NU) In exercises where one submarine is ordered to be 'marked submarine' (Article 4.11.1), the unmarked submarine automatically becomes responsible for taking action to avoid coming Too Close to the marked submarine.

4.21.3. (NU) If two submarines get Too Close (Article 4.17) or if a submarine collision appears imminent:

- a. **The target submarine is to surface;** and
- b. **The attacking submarine is to go to a safe depth** (as described in Article 2.2.13) and remain there until surfaced by the target submarine. (Article 2.2.3 applies unless Relaxations in force otherwise permit.)

#### 4.22 SAFETY CIRCLE

4.22.1. (NU) The attacking submarine may be at any depth within the inner safety circle. When outside the inner safety circle, the attacking submarine must remain below 97 meters (318 feet). If Relaxation 21\*C (Table 3-2) is in force when HE is detected, the attacking submarines may proceed to periscope depth to classify the noise source, provided:

- a. It points the bearing (toward or away);
- b. The bearing is changing; and
- c. It returns to 97 meters (318 feet) within 5 minutes of reaching periscope depth.

4.22.2. (NU) When submerged, the target submarine is **never** to cross the outer safety circle. If forced deep, it is not to go below 62 meters (203 feet) and is to increase speed as necessary to continue cavitating. If unable to cavitate, it is to transmit on UWT or SST its call sign at least once every minute.

4.22.3. (NU) Unless otherwise specified in the exercise orders/message the Special Safety Circle in CASEX S-4 has a radius of 3000 yards centered on the initial position of each attacking submarine (see Relaxation 24\*B). In this case there is no outer safety circle and attacking submarines are never to cross their safety circles.

4.22.4. (NU) The radius of the special safety circle is defined in Relaxation 24\*C. This safety circle only applies for bottomed submarines. A Rescue Support Submarine must never bottom within this safety circle. The safety circle is never to be less than 200 yards.

## 4.23 SAFETY LINE

(NU) Attacking submarines are never to cross the safety line.

## 4.24 SAFETY ZONES AND TRANSIT LANES

(NU) Attacking submarines are to be at Safe Depth (Article 2.2.13) when entering a Safety Zone or a Transit Lane.

## 4.25 SAFETY RULES FOR BASIC EXERCISES

4.25.1. (NU) In basic submarine exercises, safety of participating submarines is achieved by:

- a. Horizontal separation (e.g. safety line);
- b. Vertical separation (e.g. by assigning submarines separate depth zones); or
- c. A combination of a. and b. (e.g. safety circles).

## 4.26 SAFETY RULES FOR ADVANCED EXERCISES

4.26.1. (NU) In advanced submarine ASW exercises, when both the attacking and target submarines may operate at periscope depth without horizontal separation, safety is achieved by:

- a. Time separation during which either the attacking or target submarine may be at periscope depth; and/or
- b. Either the attacking or target submarine being ordered to actively transmit on UWT or SST while at periscope depth.

4.26.2. (NU) Submarines not required to actively transmit on UWT or SST may snorkel when periscope visibility is not less than 2000 yards during daylight and at night during assigned periods only.

4.26.3. (NU) Submarines required to transmit at periscope depth are to broadcast "SCOPE-SCOPE-SCOPE" or "ACA" on UWT or SST, respectively, at intervals not to exceed 3 minutes.

## 4.27 (NC) (NMM) NOT RELEASABLE

## 4.28 SEPARATION BETWEEN TARGET SUBMARINES

4.28.1. (NU) When two or more target submarines are participating, each having its own Transit Lane, the boundaries of their respective Transit Lanes are to be separated by not less than 5 miles.

4.28.2. (NU) When routed via the same Transit Lane, target submarines are to be not less than 10 miles apart. This separation is to be increased to not less than 20 miles for exercises of more than 24 hours duration.

## **4.29 Spare**

## **4.30 PROCEDURES APPLICABLE TO SUBMARINE ASW EXERCISES**

### **4.31 GRIDLOCK**

4.31.1.(NU) In open water, where accurate navigation may not be possible, submarine ASW exercises may achieve a degree of accurate positioning by gridlocking the relative positions of participating submarines prior to GO TIME for each run/exercise.

4.31.2. (NU) Method for Gridlock

- a. Both the target and attacking submarines are stopped on the surface or at periscope depth in pre-selected positions not more than 8000 yards apart.
- b. Both submarines fix their relative positions, by the most accurate method available, and mutually exchange bearing and range.
- c. Using a modified Cartesian coordinate grid, see ATP-01 Volume I, the attacking submarine's initial position is the grid position (0,0) plotted on its DR plot. To improve accuracy the size of the grid is reduced to 100 by 100 nautical miles.
- d. Both submarines start their DR plots at the time ordered by the attacking submarine.

### **4.32 PROCEDURE FOR SUBMARINES CHANGING DEPTH THROUGH DEPTH ZONES ASSIGNED TO OTHER SUBMARINES**

4.32.1.(NU) In advanced exercises where submarines have freedom of action in assigned depth zones, they are to observe special caution when changing depth through depth zones assigned to other submarines. (see Relaxations 21\*E, 21\*F and 21\*G).

4.32.2. (NU) When changing depth zones, or if out of assigned depth zone for any reason, the following procedure shall apply:

- a. From 3 minutes before changing depth, while passing through, and clear of the other submarine's depth zone, each submarine shall:
  - (1) Steer Safety Course, and
  - (2) Transmit the appropriate signal from Table 4-1 at least once a minute.
- b. Any submarine hearing these Safety Signals will become the responsible submarine, and if there is risk of submerged collision shall take the following action:

- (1) Turn to and remain on the ordered Safety Course until the transmission of the Safety Signals has ceased, indicating that the other submarine has reached its assigned depth zone; and
- (2) Initiate a range check (Table 5-9).
- (3) If the changing depth signal is answered within the 3 minute period (paragraph 2a above) neither submarine is to change depth until it has ascertained that it is safe to do so.

4.32.3. (NU) When changing depth in order to go to periscope depth submarines may clear baffles in the depth zone allocated to another submarine only if Relaxation 21\*F and 21\*G are in force and provided they transmit the word "Baffles" vice the code word for the safety course (see Table 4-1).

## 4.33 USE OF UNDERWATER TELEPHONE

4.33.1. (NU) During submarine ASW exercises, the volume control of the UWT must be at a gain setting which will ensure reception of Safety Signals.

4.33.2. (NU) When transmitting Safety Signals, the UWT transmitter gain control should be at a maximum practical setting. It may be dangerous to reduce the volume of the Safety Signals by turning down the gain or by 'whispering'.

| Heading             | VOICE/UWT                                                         |                                                | CW/SST |     |            |
|---------------------|-------------------------------------------------------------------|------------------------------------------------|--------|-----|------------|
|                     | Coming Up                                                         | Going Down                                     | Coming | Up  | Going Down |
| North               | Deep-Deep-Deep<br>Coming Up November                              | Shallow-Shallow-Shallow<br>Going Down November | UUN    | UUB | QN         |
| East                | Deep-Deep-Deep<br>Coming Up Echo                                  | Shallow-Shallow-Shallow<br>Going Down Echo     | UUE    | UUB | QE         |
| South               | Deep-Deep-Deep<br>Coming Up Sierra                                | Shallow-Shallow-Shallow<br>Going Down Sierra   | UUS    | UUB | QS         |
| West                | Deep-Deep-Deep<br>Coming Up Whiskey                               | Shallow-Shallow-Shallow<br>Going Down Whiskey  | UUW    | UUB | QW         |
| Clearing<br>Baffles | Deep, deep, Deep<br>Coming up Baffles,<br>(.....) depth in meters |                                                |        | UUB |            |

Table 4-1. Changing Depth Safety Signals (NU)

## 4.34 MARKING ATTACKS

4.34.1. (NU) When a submarine has made an attack on another submarine, and to enable the attacking submarine to make an initial assessment of its attack, the following procedure

for marking attacks is to be followed:

- a. By the Attacking Submarine
- b. Make appropriate Attack Signals (Table 5-4).
- c. Initiate a range check by Mark-Snap method (Table 5-9).
- d. Make ME-YOU Message (Article 6003).
- e. By the Target Submarine
- f. Acknowledge Attack Signals (Table 5-4).
- g. Reply to Range check (Table 5-9).
- h. Reply to ME-YOU Message (Article 6003).

#### **4.35 REQUIREMENTS WHEN TORPEDOES ARE FIRED**

4.35.1. (NU) When Relaxation 2K has been authorized for submarine ASW exercises, torpedoes may be fired in accordance with Articles 2.2.52.1.C.(2) (NMM) NOT RELEASABLE.

4.35.2. (NU) The firing submarine is responsible for stationing the torpedo recovery vessel and for providing information to spotter aircraft (if available).

#### **4.36 - 4.39 Spare**

#### **4.40 METHOD OF ORDERING SUBMARINE ASW EXERCISES**

4.40.1. (NU) Submarine exercises are to be ordered by using Order Table 3-1.

4.40.2. (NU) Standard submarine ASW exercises ('S' Series CASEXes) are listed in Table 4-2.

4.40.3. (NU) Appropriate relaxations (Table 3-2) and/or exercise instructions (Table 3-3) may be used as required to achieve realistic training objectives.

#### **4.41 - 4.49 Spare**

**4.50 (NMM) NOT RELEASABLE**

**4.51 (NMM) NOT RELEASABLE**

## 4.52 (NMM) NOT RELEASABLE

## 4.53 - 4.99 Spare

| CASEX No.            | TITLE                                                                                                                                                      | MINIMUM DURATION                | MINIMUM SIZE OF AREA                     | REMARKS                                                                                                                                                                              |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S-1                  | Submarine, at or below safe depth, attacks another submarine transiting its patrol area at periscope depth.                                                | 2 hrs per run                   | 10 x 10 nm                               | Basic Exercise                                                                                                                                                                       |
| S-2                  | Submarine, at periscope depth (or with freedom in depth until detecting HE), attacks another submarine transiting its patrol area at periscope depth.      | 2 hrs per run                   | 10 x 10 nm                               | Basic Exercise (may be made more advanced by Relaxation 21*D)                                                                                                                        |
| S-3                  | Submarine, with freedom in depth, attacks another submarine transiting close to its patrol area at periscope depth.                                        | 2 hrs per run                   | 10 x 10 nm                               | Intermediate Exercise                                                                                                                                                                |
| S-4                  | One or more submarines, at periscope depth, attack another submarine transiting their patrol areas at periscope depth (by day only).                       | 2 hrs                           | 10 x 10 nm                               | Intermediate Exercise                                                                                                                                                                |
|                      |                                                                                                                                                            | (for each patrolling submarine) |                                          |                                                                                                                                                                                      |
| S-5                  | One or more submarines, with freedom in depth, attack another submarine, restricted in depth, in a transit lane transiting through their areas.            | 4 hrs                           | 10 x 10 nm                               | More Advanced Exercise                                                                                                                                                               |
|                      |                                                                                                                                                            | (for each patrolling submarine) |                                          |                                                                                                                                                                                      |
| S-6                  | One or more patrolling submarines, with relative freedom in depth, attack other submarines, with relative freedom in depth, transiting their patrol areas. | 48 hrs                          | 20 x 20 nm for each patrolling submarine | These are advanced exercises designed to exercise submarines as realistically as possible, and are particularly suitable for large scale exercises and/or Sub/Air Barrier exercises. |
| S-7                  | (NMM )NOT RELEASABLE                                                                                                                                       |                                 |                                          |                                                                                                                                                                                      |
| S-8                  | (NMM) NOT RELEASABLE                                                                                                                                       |                                 |                                          |                                                                                                                                                                                      |
| S-9                  | Advanced exercise of detection, tracking and Attack of a transiting submarine on a SUBNOTE                                                                 |                                 |                                          |                                                                                                                                                                                      |
| S-10                 | (NMM) NOT RELEASABLE                                                                                                                                       |                                 |                                          |                                                                                                                                                                                      |
| S-11                 | (NMM) NOT RELEASABLE                                                                                                                                       |                                 |                                          |                                                                                                                                                                                      |
| S-12 to S-20: Spares |                                                                                                                                                            |                                 |                                          |                                                                                                                                                                                      |

Table 4-2. 'S' Series CASEXes (NU)

4-9 (RB)

EDITION E VERSION 7

**INTENTIONALLY BLANK**

## CASEX S-1

### **SUBMARINE, AT OR BELOW SAFE DEPTH, ATTACKS ANOTHER SUBMARINE TRANSITING ITS PATROL AREA AT PERISCOPE DEPTH**

#### **(NU) PURPOSE**

To exercise a submarine patrolling at or below Safe Depth in detecting, classifying, tracking and attacking another submarine transiting its area at periscope depth.

#### **(NU) FORCES REQUIRED**

Two submarines.

#### **(NU) SITUATION**

1. The attacking submarine is at periscope depth in its assigned initial position.
2. The target submarine is at periscope depth in a position approximately 20,000 yards from the attacking submarine's initial position.

#### **(NU) PROCEDURE**

1. Establish communications prior to GO TIME.
2. Initiate runs by the Executive method.
3. At GO TIME for each run, the target submarine commences a dived transit (remaining at periscope depth and cavitating throughout) to pass within a specified range of the attacking submarine's initial position. Unless otherwise ordered, the target is unrestricted for course and speed.
4. The attacking submarine is to remain at or below Safe Depth from 10 minutes after GO TIME. After detecting and classifying the target submarine, the attacking submarine is to track and close the target to achieve a firing position.
5. On receipt of the Attack (or Run Completed) signal, the target submarine is to surface, and then surface the attacking submarine in accordance with Articles 2.2.72 and 2.2.73 unless Relaxations in force otherwise permit.
6. Target should not maneuver to avoid torpedoes.
7. If the Attack (or Run Completed) signal is not received by the time the target submarine has reached a position 8000 yards beyond the attacking submarine's initial position, the target submarine is to surface, and then surface the attacking submarine in accordance with Article 2.2.73 unless Relaxation in force permit otherwise.

8. The exercise ends on completion of the last Run or at STOP TIME, whichever is the earlier.

## **(NU) SPECIAL PROVISIONS**

1. The ranges in Situation (paragraph 2) and Procedure (paragraph 7) may be altered at the discretion of the OTC/OCS.
2. To save time and to assist in classification, the attacking submarine may request the target submarine to transmit (for a short time or at intervals) on its echo sounder (Designator U of the Order Table).

## **(NU) RECORDS**

1. ME-YOU Message on completion of each run.
2. In accordance with Article 4.5.

CASEX S-2

**SUBMARINE, AT PERISCOPE DEPTH (OR WITH FREEDOM IN DEPTH UNTIL DETECTING HE) ATTACKS ANOTHER SUBMARINE TRANSITING ITS PATROL AREA AT PERISCOPE DEPTH**

**(NU) PURPOSE**

To exercise a submarine patrolling at periscope depth, or with freedom in depth until detecting HE, in detecting, classifying, tracking and attacking another submarine transiting its patrol area at periscope depth.

**(NU) FORCES REQUIRED**

Two submarines.

**(NU) SITUATION**

1. The attacking submarine is on the surface in its assigned initial position.
2. The target submarine is at periscope depth in a position approximately 10,000 yards from the attacking submarine's initial position. The target submarine's initial position is not to be disclosed to the attacking submarine; however the Safety Bearing reported by the target submarine will be known by the attacking submarine.

**(NU) PROCEDURE**

1. Establish communications prior to GO TIME.
2. When the attacking submarine is ready for the exercise, it reports to the target submarine **"Ready for Run One"**.
3. On receipt of the "Ready" signal, the target submarine takes a bearing and radar range of the attacking submarine and signals **"GO TIME Run One (time). Safety Bearing is (...). Read Back."** (see Article 4.13). The target submarine is not to commence its transit, nor is the attacking submarine to dive, until this signal has been read back correctly.
4. Both submarines establish the Safety Line on their plots (Article 4.15 and 4.23). The Safety Bearing and Safety Line are not to be altered during the Run.
5. The target submarine is to remain at periscope depth throughout the Run. Unless otherwise ordered, it is unrestricted for course and speed and must broadcast SCOPE SCOPE SCOPE or ACA on UWT or SST respectively at intervals not to exceed 3 minutes (Article 4.26.3).
6. After GO TIME for the Run, the target submarine is free to open the range before actually commencing its transit towards the attacking submarine's initial position.

7. The attacking submarine is to remain at periscope depth (unless Relaxation 21\*D is in force) while conducting its approach and attack. On completion of each attack/Run, the attacking submarine is to surface and inform the target submarine "Run (No.) Completed" and remain in its surfacing position until GO TIME for the next Run.
8. On receipt of the Attack (Run Completed) signal, the target submarine may remain at periscope depth while proceeding to the start position for the next Run, and signals **"GO TIME Run (No.) (time). Safety Bearing is (...). Read Back"**.
9. The full procedures for plotting Safety Bearing and Safety Line, and for commencing the Run, are to be conducted for each subsequent Run.
10. When attacking and target roles are reversed, the target submarine is to surface on receipt of the "Run Completed" signal, and remain in its surfacing position for the attacking submarine. The attacking submarine is now the target submarine and opens the range for the next Run and uses the full procedure for starting a Run.
11. If the attack (or Run Completed) signal has not been received by the time the target submarine has reached a position 8000 yards beyond the Safety Line, the target submarine is to surface, and then surface the attacking submarine in accordance with Article 2.2.73 unless relaxations in force permit otherwise.
12. The exercise ends on completion of the last Run, or at STOP TIME, whichever is the earlier.

## (NU) SPECIAL PROVISIONS

1. The ranges in Situation (paragraph 2) and Procedure (paragraph 12) may be altered at the discretion of the OTC/OCS.
2. Normally this exercise is conducted by day, but may be conducted by night if Relaxation 21\*D is in force.
3. Submarines are to surface if they are liable to be put deep by a surface vessel.
4. Submarines are to surface and stop the exercise if the visibility through the periscope becomes less than 2000 yards unless Relaxation 13\*B is in force.
5. Unless Relaxation 21\*D is in force, the attacking submarine is to be **marked** and the following rules apply:
  - a. The **target** submarine is the responsible **submarine**;
  - b. The target submarine is to surface if -
    - (1) Within 1000 yards of the Safety Line without having sighted the attack submarine, or

- (2) Having crossed the Safety Line, it loses sight of the attacking submarine.
  - c. The target submarine is **not** to alter course toward the attacking submarine once it has crossed the Safety Line.
6. If, despite the Safety Rules, either submarine is forced deep, it is to turn to a course reciprocal to the **last** bearing of the other submarine and is to remain within 40 degrees of that course until it is safe to return to periscope depth.
7. This CASEX can be made more realistic by the use of Relaxation 21\*D. In this case the following rules apply:
- a. On detecting and classifying the target submarine's HE, the attacking submarine is to signal that it is going to Safe Depth. The target submarine must acknowledge the signal **before** the attacking submarine goes deep.
  - b. After receipt of the acknowledgement, the attacking submarine is to go to and remain at the end of the run. The attacking submarine is now free to cross the Safety Line.
  - c. The target submarine is to surface if, within 1000 yards of the Safety Line, it has not received and acknowledged the attacking submarine's "Going to safe depth" signal.

## (NU) RECORDS

- 1. ME - YOU Message on completion of each Run.
- 2. In accordance with Article 4.5.

**INTENTIONALLY BLANK**

## CASEX S-3

### SUBMARINE WITH FREEDOM IN DEPTH ATTACKS ANOTHER SUBMARINE TRANSITING CLOSE TO ITS PATROL AREA AT PERISCOPE DEPTH

#### (NU) PURPOSE

To exercise, under realistic patrol conditions, a patrolling submarine in detecting, classifying, tracking and attacking another submarine transiting close to patrol area at periscope depth.

#### (NU) FORCES REQUIRED

Two submarines.

#### (NU) SITUATION

1. More realistic patrol conditions are achieved by the attacking submarine having freedom of movement and limited freedom in depth, but little or no knowledge of where or when the target submarine will transit close to its area.
2. The attacking submarine, at any depth, is within a Safety Circle (Articles 4.14 and 4.22).
3. The target submarine is at periscope depth in a position not less than 10,000 yards from the centre of the Safety Circles at GO TIME.
4. The principles of this exercise may be employed in submarine ASW exercises and Sub/Air Barrier exercise.

#### (NU) PROCEDURE

1. The target submarine commences its submerged transit any time after GO TIME.
2. The target submarine is unrestricted in course and speed and is free to evade attack, but must remain at periscope depth and cavitate throughout the exercise/Run and comply with Article 4.22.2.
3. The attacking submarine commences its submerged patrol at GO TIME and must comply with Article 4.22.1 until STOP TIME or until surfaced by the target submarine.
4. If the target submarine has not been attacked and has reached a position beyond the centre of the Safety Circles at which the distance is 2000 yards greater than the radius of the Outer Safety Circle, it is to surface and then surface the attacking submarine in accordance with Article 2.2.72, unless Relaxation is in force otherwise permits.
5. The exercise ends on completion of the last Run, or at STOP TIME, whichever is the earlier.

## **(NU) SPECIAL PROVISIONS**

1. The safety and success of this CASEX depend on accurate navigation. If accurate fixes cannot be obtained, submarines must gridlock prior to GO TIME (Article 4.31).
2. The target submarine is to surface if it is liable to be put deep by a surface vessel.
3. Sub/Air Barrier exercises are to be conducted in accordance with current Air/Sub procedures.

## **(NU) RECORDS**

1. ME - YOU Message on completion of each Run.
2. In accordance with Article 4.5.

## CASEX S-4

### ONE OR MORE SUBMARINES AT PERISCOPE DEPTH ATTACK ANOTHER SUBMARINE TRANSITING THEIR PATROL AREAS AT PERISCOPE DEPTH (BY DAY ONLY)

#### (NU) PURPOSE

To exercise submarines patrolling at periscope depth in detecting, classifying, tracking and attacking another submarine transiting at periscope depth.

#### (NU) FORCES REQUIRED

1. One or more attacking submarines.
2. One target submarine.

#### (NU) SITUATION

1. An exercise based on CASEX S-2 with any number of submarines attacking the same target. Each attacking submarine is positioned within its Special Safety Circle (Article 4.22.3).
2. The attacking submarines are on the surface, in their Special Safety Circles specified in the exercise orders/message.
3. The target submarine is at periscope depth in a position not less than 10,000 yards from the centre of the Special Safety Circle of the first attacking submarine. This position is not to be disclosed to the attacking submarine.

#### (NU) PROCEDURE

1. Establish communications prior to GO TIME.
2. When all attacking submarines have reported "**Ready for Run One**", the target submarine will order "**GO TIME Run One (time), Acknowledge**".
3. After acknowledging, the attacking submarines are to dive to periscope depth at GO TIME for the Run.
4. At GO TIME for each Run, the target submarine commences a dived transit (remaining at periscope depth throughout) to pass through each attacking submarine's Special Safety Circle. Unless otherwise ordered, it is unrestricted for course and speed and must broadcast SCOPE SCOPE SCOPE or ACA on UWT or SST respectively at intervals not to exceed 3 minutes (Article 4.26.3).
5. Attacking submarines are to remain at periscope depth and within their Special Safety Circles (Article 4.22.3) while conducting their approach and attack.

6. On completion of each attack/Run, attacking submarines are to surface and return to their initial positions, but are not to dive again until the target submarine has reported "**Clear of Safety Circle.**"
7. (NU) On receipt of each Attack (Run Completed) signal, the target submarine remains at periscope depth and commences its Run for the next attacking submarine. When clear of an attacking submarine's Special Safety Circle, it must report to that submarine "**Clear of Safety Circle.**"
8. The exercise ends on completion of the Run for the last submarine, or at STOP TIME, whichever is the earlier.

## (NU) SPECIAL PROVISIONS

1. This exercise is to be conducted by day only.
2. The circumferences of individual Special Safety Circles should not be less than 4000 yards apart.
3. It is imperative that reliable fixes can at all times be obtained. Submarines are to surface if at any time they are uncertain of their navigational positions.
4. Submarines are to surface if they are liable to be put deep by a surface vessel.
5. Submarines are to surface and stop the exercise if the visibility through the periscope becomes less than 3000 yards.
6. Attacking submarines are to be **marked** and the following rules apply:
  - a. The **target** submarine is the **responsible** submarine;
  - b. The target submarine is to surface if -
    - (1) Within 1000 yards of a Special Safety Circle without having sighted the attacking submarine, or
    - (2) Having crossed the Special Safety Circle, it loses sight of the attacking submarine; and
  - c. The target submarine is **not** to alter course toward the attacking submarine once it has entered the Special Safety Circle.
7. If, despite the Safety Rules, either submarine is forced deep, it is to turn to a course reciprocal to the **last** bearing of the other submarine and is to remain within 40 degrees of that course until it is safe to return to periscope depth.

## (NU) RECORDS

1. ME - YOU Message on completion of each Run.
2. In accordance with Article 4.5.

## CASEX S-5

### ONE OR MORE SUBMARINES WITH FREEDOM IN DEPTH ATTACK ANOTHER SUBMARINE RESTRICTED IN DEPTH IN A TRANSIT LANE TRANSITING THROUGH THEIR AREAS

#### (NU) PURPOSE

To exercise patrolling submarines with freedom in depth in detecting, classifying, tracking and attacking another submarine which is restricted in depth, transiting through their areas.

#### (NU) FORCES REQUIRED

1. One or more attacking submarines.
2. One target submarine.

#### (NU) SITUATION

1. The attacking submarines may be at any depth in their assigned patrol areas when outside the Safety Zones and Transit Lanes (Articles 4.16 and 4.18).
2. The target submarine may be at any depth within its assigned Depth Zone in the Transit Lane. (NMM) NOT RELEASABLE.
3. The Transit Lane runs through each attacking submarine's patrol area.

#### (NU) PROCEDURE

1. Depth Zone throughout. Unless otherwise ordered, it is unrestricted for course and speed but must remain within the Transit Lane and must broadcast SCOPE SCOPE SCOPE or ACA on UWT or SST respectively at intervals not to exceed 3 minutes (Article 4.26.3).
2. At GO TIME, attacking submarines may be at any depth outside the Safety Zones and Transit Lane. They may enter the Safety Zones and Transit Lane (within the limits of their own patrol area) but must be at Safe Depth or deeper when doing so. (NMM) NOT RELEASABLE.
3. On completion of each attack/Run, attacking submarines may, if safe to do so, return to periscope depth and, if desired, surface to wait instructions for the next Run.
4. The exercise ends on completion of the last Run, or at STOP TIME, whichever is the earlier.

#### (NU) SPECIAL PROVISIONS

1. The safety and success of this CASEX depend on accurate navigation by all participants. (See Special Provision 6 below.)
2. (NU) Attacking submarines are not to approach within one mile of the edges of their areas.
3. (NU) Submarines are to surface as follows:
  - a. The target submarine -
    - (1) If at any time its navigational position is in doubt,
    - (2) If restricted to periscope depth during its transit and liable to be put deep by surface shipping, or
    - (3) If, despite the above, the target submarine is forced deep, it is to transmit on UWT/SST call sign, course and depth; and
  - b. The attacking submarine(s) (outside the Safety Zones and Transit Lane) if, at any time, its navigational position is in doubt.
4. The target submarine's Depth Zone, transit positions, width of Transit Lane and Safety Zones are to be specified in the exercise orders/messages.
5. If more than one target submarine participates, Article 4.28 is applicable.
6. If this CASEX is conducted in an area where accurate navigation may not be possible, the following additional provisions apply:
  - a. Establish communications prior to GO TIME;
  - b. Only one target submarine and one attacking submarine may participate;
  - c. Submarines are to gridlock their relative positions and start their DR plots in accordance with Article 4.31);
  - d. Transit positions are selected by the target submarine and are to be transmitted to the attacking submarine by the **READ BACK** method;
  - e. Submarines are not to make allowance for tidal streams, currents or drift; and
  - f. Submarines are to surface if the accuracy of their DR plots is in doubt.
7. Full procedures are to be repeated for subsequent runs.

## (NU) RECORDS

1. ME - YOU Message on completion of each attack.
2. In accordance with Article 4.5.

CASEX S-6

ONE OR MORE PATROLLING SUBMARINES WITH RELATIVE  
FREEDOM IN DEPTH ATTACK OTHER SUBMARINES WITH  
RELATIVE FREEDOM IN DEPTH TRANSITING THEIR AREAS

(NU) PURPOSE

To exercise submarines in advanced ASW operations.

(NU) FORCES REQUIRED

1. Two or more attacking submarines.
2. ASW ships and aircraft if desired.

(NU) SITUATION

1. Patrolling submarines are in their allocated Depth Zones and Areas conducting ASW patrols.
2. Transiting submarines are in their allocated Depth Zones, Transit Lane(s) (Article 4.28) and initial positions, which are to be outside the patrolling submarine's Tactical Sonar Range (TSR).
3. This CASEX is particularly suited to advanced large scale exercises and Sub/Air Barrier exercises.

(NU) PROCEDURE

1. At GO TIME, transiting submarines commence dived transits within their assigned Transit Lane(s) and Depth Zones at the ordered Speed of Advance (SOA) or remaining within their Mobile Exercise Area (MXA). Unless otherwise ordered, they have freedom of movement (course and speed) within assigned Transit Lane(s) between the surface and periscope depth and when in their allocated **deep** Depth Zone. While at periscope depth, submarines must broadcast SCOPE SCOPE SCOPE or ACA on UWT or SST respectively at intervals not to exceed 3 minutes (Article 4.26.3). Within exercise objectives, transit policy is at the discretion of individual Commanding Officers.
2. At GO TIME, patrolling submarines commence ASW patrols, remaining in their patrol areas. They have freedom of action (course, speed and depth) from the surface to the floor of their allocated **upper** Depth Zone and within their **lower** Depth Zone.
3. Submarines may be at periscope depth and/or snorkel as follows:
  - a. **Transiting Submarines.** At any time when in assigned Transit Lane(s) except during the night periods allocated to patrolling submarines (Relaxations 21A or B) when they must be on the surface or in their allocated **deep** Depth

Zone. If on the surface during these periods and required to dive, transiting submarines must immediately go to and remain in their assigned **deep** Depth Zones.

b. **Patrolling Submarines -**

- (1) **By Day.** Sunrise to Sunset, if periscope visibility is not less than 2000 yards (Article 4.26.2); but see paragraph 4a below.
- (2) **By Night.** During allocated periods (Relaxations 21A or B).
- (3) **To Classify.** Classify sonar contacts in accordance with paragraph 4 below.

4. Patrolling submarines may classify sonar contacts as follows:

- a. **If at periscope** depth and a sonar contact is achieved which cannot be classified as a surface target or snorkeling submarine within 5 minutes of the acquisition, they are to go to the floor of their **upper** Depth Zone, and remain in there throughout the attack/time in contact. This restriction does not apply during the night periscope depth periods allocated to patrolling submarines.
- b. **If deep** when contact achieved, come to periscope depth in accordance with Article 4.32. If the contact is not classified as a surface target or a snorkeling submarine within 5 minutes after arrival at periscope depth, they are to return either to the floor of their **upper** Depth Zone or to their **deep** Depth Zone in accordance with Article 4.32, and remain there throughout the attack/time in contact. This restriction does not apply during the night periscope depth periods allocated to patrolling submarines.

5. Submarines may evade attack as follows:

a. **Transiting Submarines**

- (1) **If surfaced**, by altering course and/or speed; but **do not dive**.
- (2) **If at periscope depth**, by altering speed and stopping snorkeling. Broadcast SCOPE SCOPE SCOPE or ACA on UWT or SST respectively at intervals not to exceed 3 minutes (Article 4.26.3), altering course **away** or surfacing; but **do not go deeper or alter course toward**.
- (3) **If in allocated deep Depth Zone**, by altering course and/ or speed; but **remain in that Depth Zone**.

b. **Patrolling Submarines**

- (1) **If surfaced**, by altering course and/or speed; but **do not dive**.

- (2) **If in allocated Depth Zone**, they are unrestricted except that -
  - a. They are not to alter course towards; and
  - b. They must remain in that allocated Depth Zone.

**Note.**

*Evasion is not to be attempted if the attack signals are the first indication of the other submarine presence.*

- 6. With Relaxation 20A in force, transiting submarines may attack patrolling submarines while evading and before being attacked, if they are in their own allocated Depth Zones, but **must not** change Depth Zones during the attack/time in contact.
- 7. When changing depth through a Depth Zone allocated to another submarine, submarines are to comply with Article 4.32.
- 8. Participating ASW ships and aircraft conduct patrols as required by the OCE.
- 9. The exercise ends at STOP TIME.

**(NU) SPECIAL PROVISIONS**

- 1. If a submerged collision at periscope depth is imminent, submarines are to alter course away, and:
  - a. Transiting submarines are to surface.
  - b. Patrolling submarines are to go deep to the floor of their upper Depth Zone.
- 2. Transiting and patrolling submarines are to be allocated Depth Zones in accordance with Article 2.2.14 and Table 2-2, as follows: (NMM) NOT RELEASABLE.
  - a. **Transiting Submarines**
    - (1) The surface to periscope depth; **except** during night periods allocated to patrolling submarines; and
    - (2) A **Deep** zone **between** the patrolling submarine's **upper** and **lower** Depth Zones.
  - b. **Patrolling Submarines**
    - (1) An **Upper** Depth Zone to include the surface and periscope depth; and
    - (2) A **Lower** Depth Zone **below** the transiting submarine's **Deep** Depth Zone.

3. Submarines **may** be restricted for speed when in the upper Depth Zones.
4. This exercise will normally be conducted in open water; therefore, submarines are to navigate with extreme caution. If in adjacent patrol areas, submarines shall not approach within 3 miles of common boundaries.

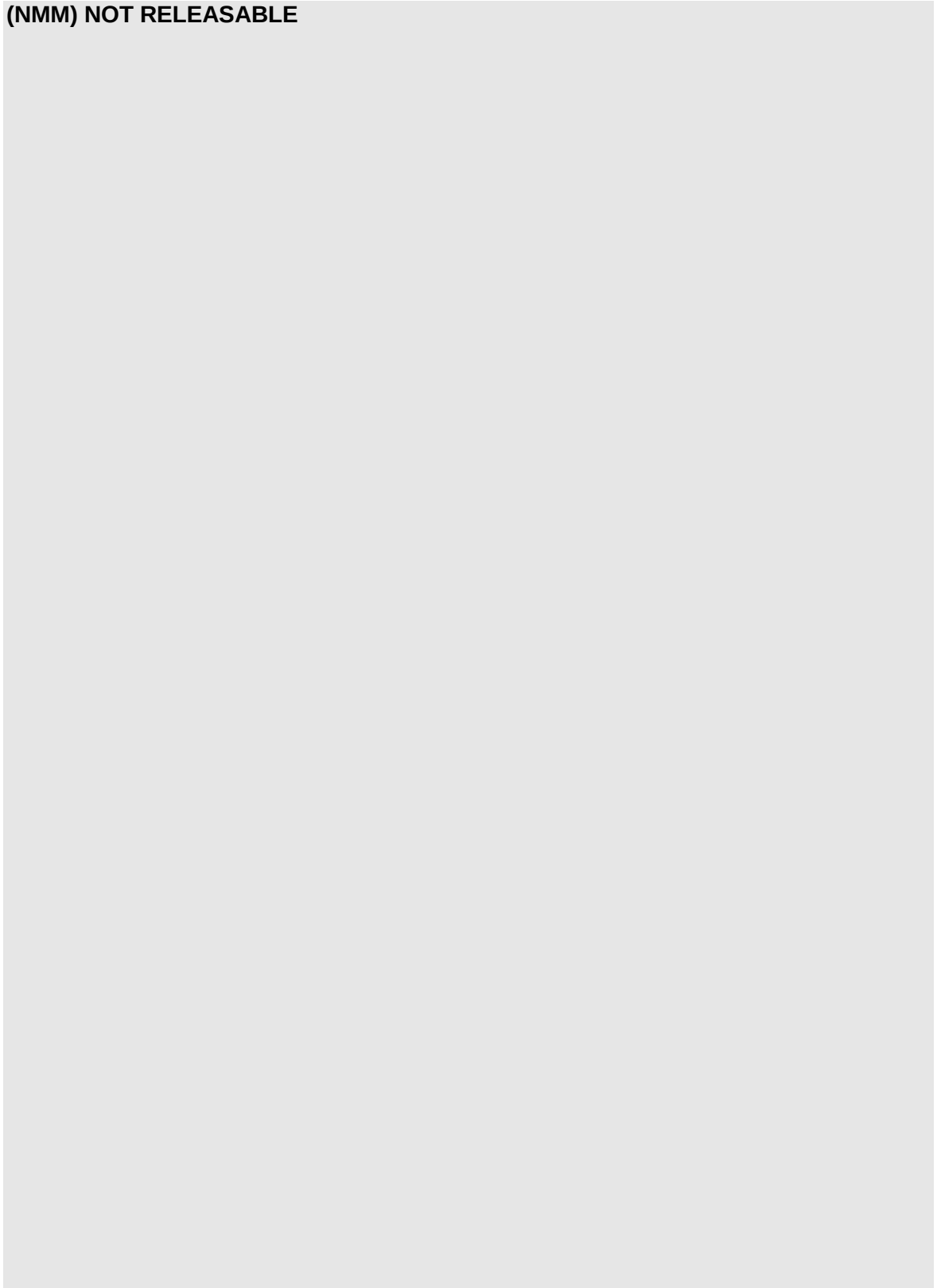
## **(NU) RECORDS**

In accordance with Article 4.5.

**CASEX S-7**

**(NMM) NOT RELEASABLE**

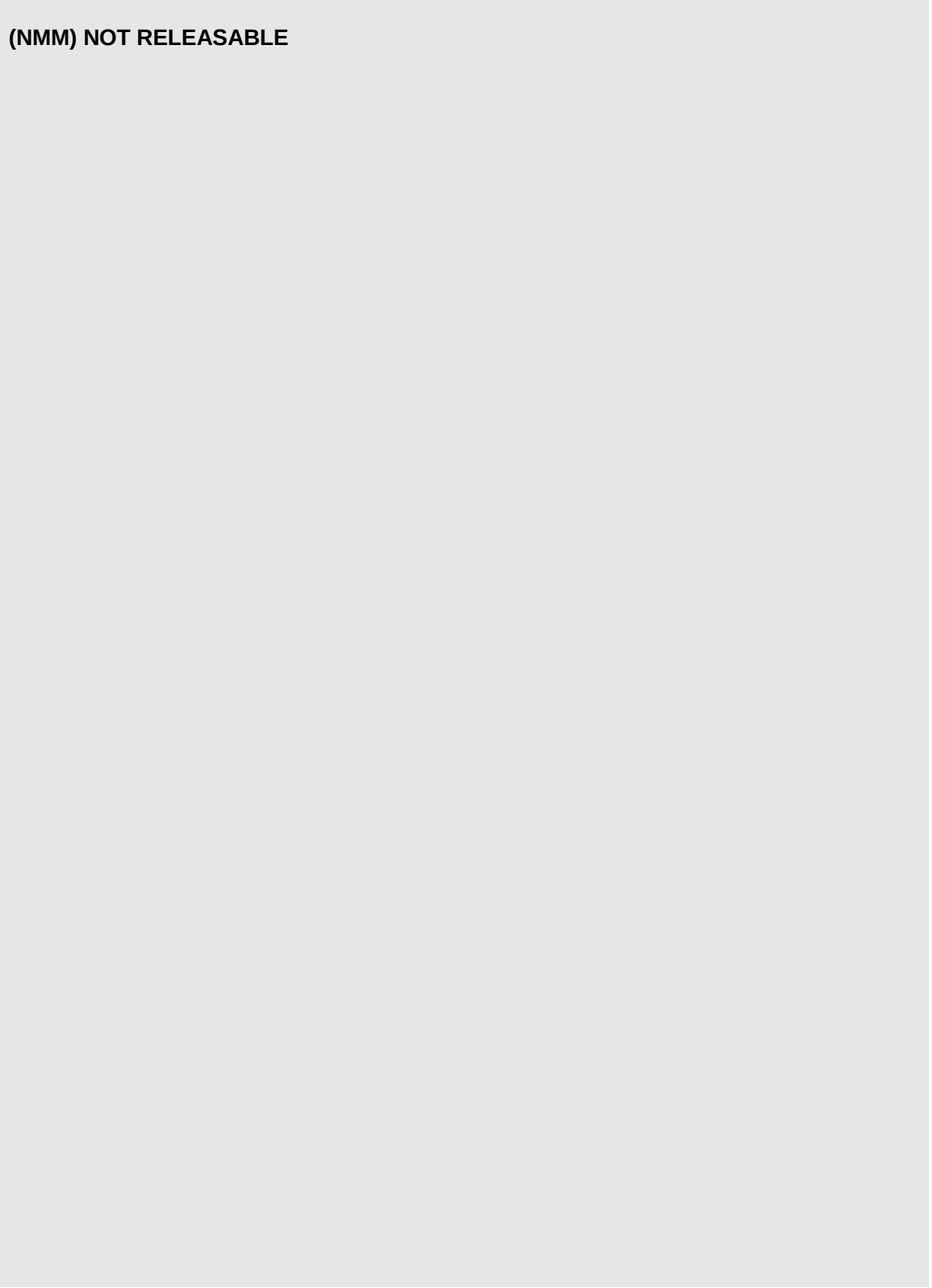
**(NMM) NOT RELEASABLE**



**CASEX S-8**

**(NMM) NOT RELEASABLE**

**(NMM) NOT RELEASABLE**



## CASEX S-9

### ADVANCED EXERCISE OF DETECTION, TRACKING AND ATTACK OF A TRANSITING SUBMARINE ON A SUBNOTE

#### (NU) PURPOSE

1. To exercise a patrolling submarine in detecting, classifying, tracking and attacking another submarine.
2. To exercise a submarine in Counter-detecting another submarine and evading.
3. To take advantage of PASSEX Training opportunities presented between a patrolling submarine and a submarine transiting on a SUBNOTE.

#### (NU) REQUIRED FORCES

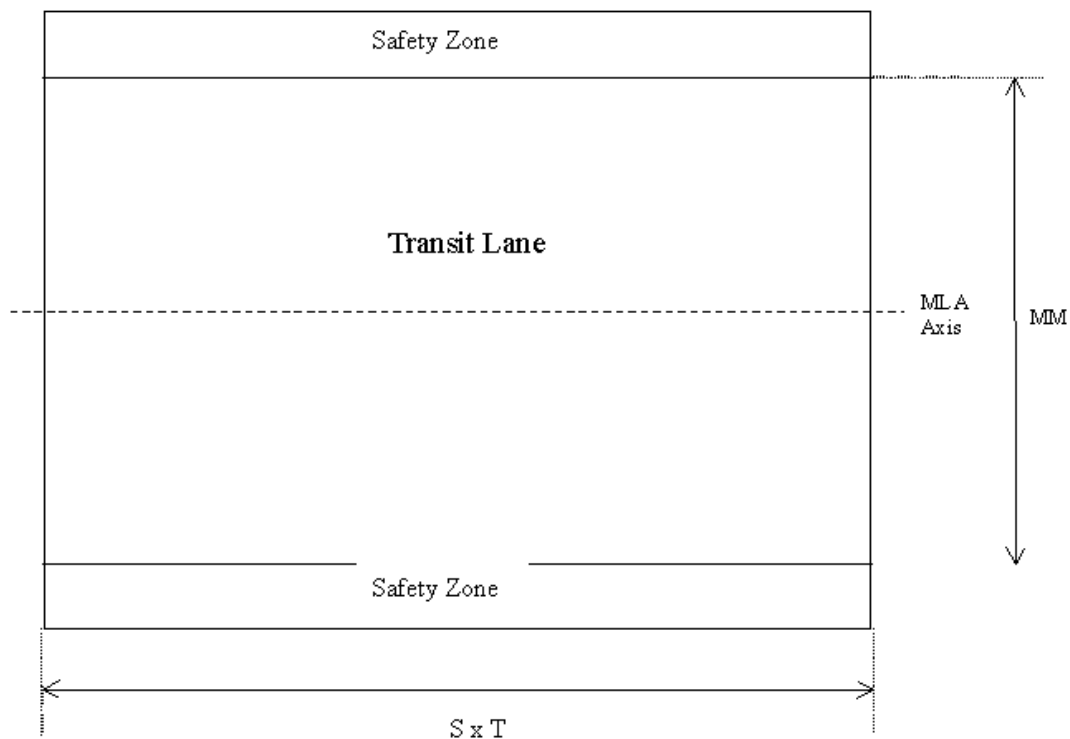
1. **FRNFOR**
  - a. One attacking submarine. The submarine should be TA equipped.
2. **OPFOR**
  - a. One target submarine.

#### (NU) SITUATION

3. This exercise can be effectively use in case of non-delaying PASSEX based on a SUBNOTE.
4. At GO TIME a transit lane which corresponds to the SUBNOTE MHN, is established geographically, with the OPFOR start position based upon the OPFOR submarine's SUBNOTE.
5. The FRNFOR submarine is on patrol waiting for a transiting submarine. It is free in depth outside of the transit lane and the safety zones. It must operate in its allocated depth zone when in the transit lane or the safety zone.
6. The OPFOR submarine is transiting in a transit lane in its allocated depth zone.
7. The transit lane is defined by the Mean Line of Advance (MLA) of the OPFOR Submarine SUBNOTE and as specified in para M and N2 of the CASEX Order Table. Safety zones are a minimum of 2nm wide.
8. Para J, JJ, N2, SS of the CASEX Order Table in accordance with the OPFOR submarine's SUBNOTE.

|                         | TRANSIT LANE                               | SAFETY ZONES                               | OUTSIDE OF TRANSIT LANE |
|-------------------------|--------------------------------------------|--------------------------------------------|-------------------------|
| <b>OPFOR Submarine</b>  | As specified in CASEX Order Table para PP2 | Forbidden                                  | Forbidden               |
| <b>FRNFOR submarine</b> | As specified in CASEX Order Table para PP1 | As specified in CASEX Order Table para PP1 | Free                    |

Table 4-3. Transit Lane (NU)



S is the average speed of the OPFOR submarine.

T is the duration of the CASEX.

MM is the width of the channel of transit lane as specified in para MM of the CASEX Order.

Figure 4-1. Submarine Transit Lane (NU)

## (NU) PROCEDURES

1. The OPFOR submarine transits in the transit lane. If requested, it can be at the most favourable depth to be detected during the first part of the CASEX. It tries to counter-

detect the FRNFOR submarine. It evades and counter-attacks according to the directions of the CASEX Order Table.

2. The OPFOR submarine is to remain at less than ½ MM from the PIM defined in the CASEX Order Table.
3. The FRNFOR submarine tries to detect and track the OPFOR submarine. From a given time, the FRNFOR submarine is allowed to attack the OPFOR submarine. A rendezvous may be planned at STOP TIME to exchange first impression report.
4. The Noise Augmentation Units (NAU) are used in accordance with the CASEX Order Table. The NAU of the FRNFOR submarine should be switched off during the attack.

**Note.**

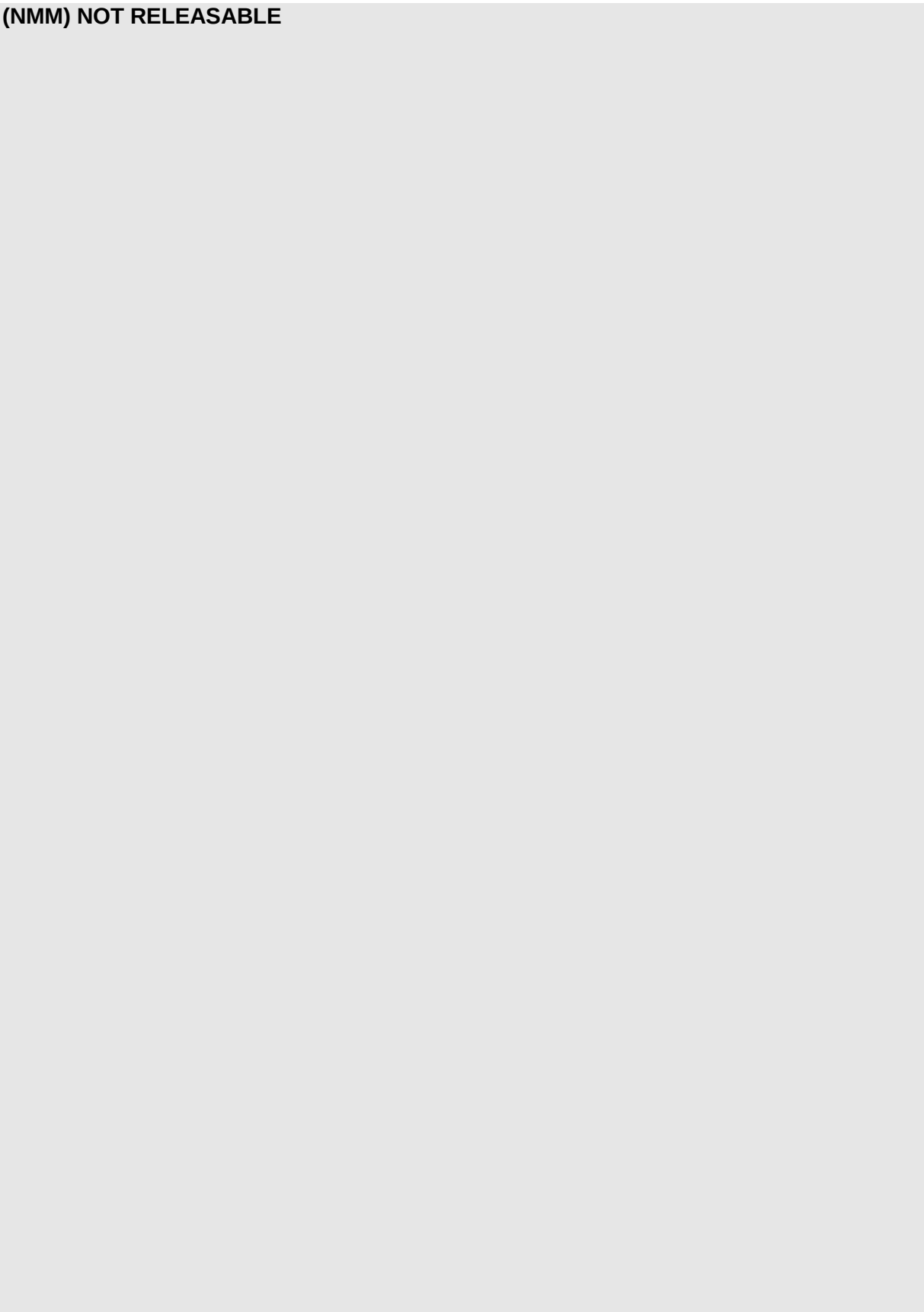
*This CASEX can also be used when both submarines are transiting on SUBNOTES provided the OPFOR submarine is allocated a Sub Area for the duration of the exercise.*

**INTENTIONALLY BLANK**

**CASEX S-10**

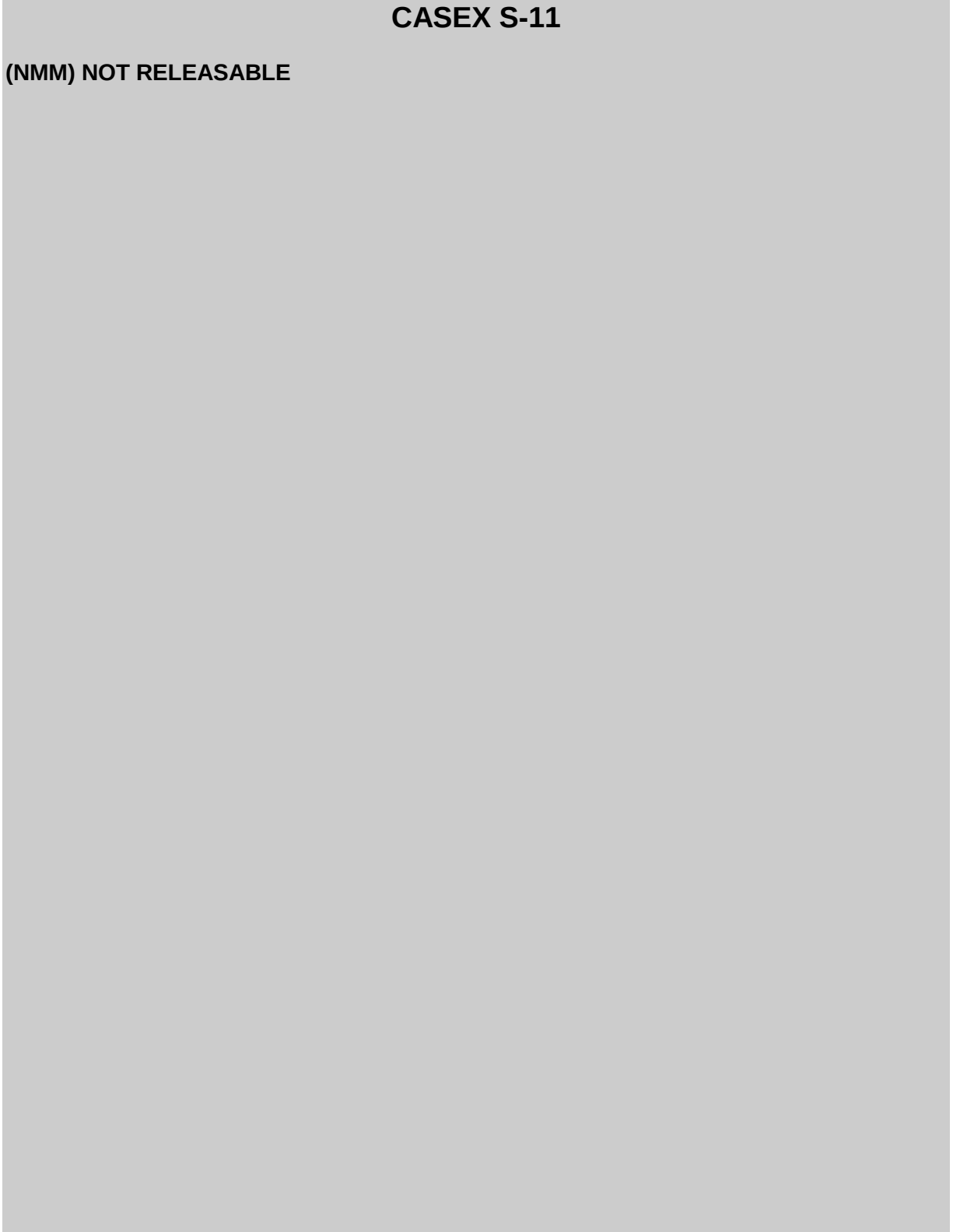
**(NMM) NOT RELEASABLE**

(NMM) NOT RELEASABLE

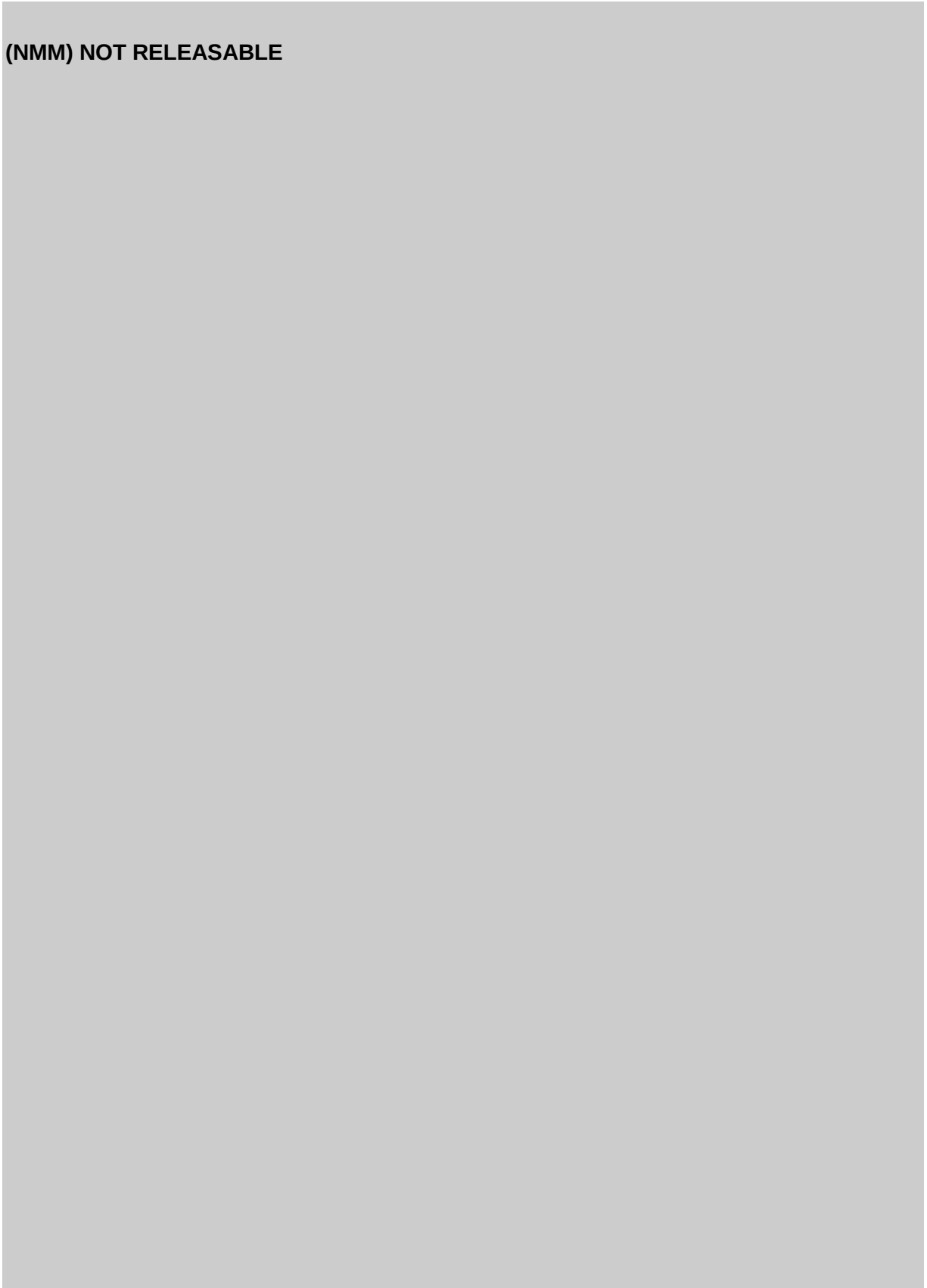


**CASEX S-11**

**(NMM) NOT RELEASABLE**



**(NMM) NOT RELEASABLE**



## CHAPTER 5

### COMMUNICATIONS

#### 5.1 INTRODUCTION

5.1.1. (NU) Some positive means of communication between all exercise participants is essential to provide for safety and control. This is normally accomplished by a combination of radio, underwater telephone (UWT), keyed sonar (SST), explosive or electronic sound signals (SUS and ESUS), and visual signals.

5.1.2. (NU) Selection of the best communication system to employ will largely depend on equipment fitted. For example, modern submarines and aircraft are not well suited for flashing light signaling. Environmental conditions are also major factors to be considered when using SST or UWT.

5.1.3. (NU) This chapter contains:

- a. The requirements and procedures for Submarine Diving and Surfacing Messages and Check Reports.
- b. Tables of communications procedures and signals between surface ships, submarines and aircraft.

#### 5.2 - 5.9 S PARE

#### 5.10 COMMUNICATION METHODS

(NU) When appropriate, submarines are to acknowledge all explosive charge signals, and ships are to acknowledge smoke flares. Explosive charge signals and submarine pyrotechnics (except B1) need not be used when in good communications by other means.

#### 5.11 EXPLOSIVE CHARGE SIGNALS

5.11.1. (NU) The safety of submarines is involved in the proper use of explosive charges and explosive charge signals. Explosive charges are not to be dropped in the immediate vicinity of submarines because of the danger of damage should the charge explode in contact with the hull (Article 2.2.40).

5.11.2. (NU) Explosive charges dropped by aircraft must comply with the prescriptions of Article 2.2.40.

5.11.3. (NU) In multiple charge signals, charges should be dropped in a regular manner and without undue delay between charges. Commanding officers of surface ships originating explosive charge signals are responsible for ensuring that a proper number of actual explosions take place for the signal intended.

5.11.4. (NU) Submarines must have a supply of explosive charge signals on board for use when on the surface.

5.11.5. (NU) As it is never certain that a submarine will hear an explosive charge signal, ships initiating COMEX at long range may repeat the COMEX signal when they have closed the contact.

5.11.6. (NU) Table 5-2 details Explosive Charge Signals, their meanings and action to be taken.

5.11.7. (NU) Since the MK 84 MOD 0 and 1 ESUS are non-explosive devices, they are also acceptable for use in communications with submarines (see Table 5-5, MK 84 MOD 0 and 1 ESUS Underwater Signal Code).

## **5.12 SUBMARINE PYROTECHNIC SIGNALS**

(NU) Submarine pyrotechnic signals (Table 5-3) may be in the form of floats (both smoke and flame), stars, flares, rockets or grenades (See Relaxation 2L). They may emit colored smoke and/or flame; their characteristics vary according to the nationality of the submarine. Submarines taking part in exercises with aircraft by day should, where possible, fire yellow smokes in order to avoid confusion with aircraft smoke markers, which normally give off white smoke. The varieties used by some nations are set forth in Table 5-1. If a red pyrotechnic is released by mistake, the submarine must surface as soon as possible to assure other forces that no emergency exists.

## **5.13 SONAR SIGNAL CODE TABLE**

(NU) This signal code is primarily for use between ASW ships/helicopters and submarines (Table 5-4). In order to ensure that the submarine understands the signal transmitted, dots should be 0.5 seconds, dashes should be 2 seconds with 5 seconds between dots and dashes and 10 seconds between letters. Thus, transmission time for the letter A is 7.5 seconds and the sequence AAA requires 42.5 seconds. This should be followed by at least 11 seconds before any other character is transmitted.

## **5.14 SUBMARINE SAFETY AND CONTROL SIGNALS**

5.14.1. (NU) Communications between the submarine and the OCE/OTC/OCS must be established in accordance with the requirements laid down for the particular CASEX. If possible this should be carried out at least 30 minutes prior to GO TIME.

5.14.2. (NU) The OCS is to ensure that the submarine has received the CASEX order and must confirm that torpedoes may be fired where this has been planned.

5.14.3. (NU) The procedure for the particular exercise is to be followed for diving the submarine.

5.14.4. (NU) COMEX is generally initiated by the first unit obtaining contact. Where this is at long range, the OCS may delay the execution of COMEX.

5.14.5. (NU) Where the exercise order (designator K) allows, the ASW action may be repeated. To repeat an ASW action, a new COMEX is to be initiated at least 5 minutes before the present ASW action ends. Then, FINEX is delayed until the end of the new ASW action (from the new COMEX). The OCS must decide if the ASW action is to be repeated, keeping the submarine informed.

## 5.15 SHIP/SUBMARINE TORPEDO ATTACK SIGNALS

(NU) The signals to be displayed by ships to show whether or not have they are open to submarine torpedo attack are given in Table 5-6. In CASEXes where torpedoes may be fired, the OTC/OCS must confirm this fact at Start Time by message to the submarine. If, at some later time, during the CASEX, weather conditions or any other factor prevents torpedo firing, every effort should be made to inform the submarine. In addition to the visual signals from Table 5-6, ships should be ordered to:

- a. Switch on navigation lights to full brilliancy.
- b. Switch off long and medium range sonar.
- c. Transmit on SST, UWT and on submarine Attack Net the signal ICI from Table 5-4. Where the type of exercise requires communications to a greater range, or sonar equipment does not allow CS transmissions, the CASEX order may allow long and medium range sonar to transmit in a mode easily recognized by a submarine to indicate that torpedoes are not to be fired. (Frequency modulation of a sonar is an example of such a mode).

## 5.16 SIGNALS BY AIRCRAFT MANEUVRE

(NU) Signals by aircraft maneuver (Table 5-7) may be used to start or stop exercises or to acknowledge messages.

## 5.17 AIRCRAFT OR SURFACE EMERGENCY/CONTINGENCY DISTRESS SIGNALS

(NU) Aircraft distress signals and signals indicating assistance by the submarine is required are set forth in Table 5-5 and Table 5-8.

## 5.18 SPECIAL SIGNALS

(NU) Submarines may use an air bubble to indicate their position.

## 5.19 SUBMARINE ATTACK SIGNALS

(NU) Submarines can mark their attacks using different modes to communicate to a unit that is being attacked.

- a. Marking of Short Range Torpedo Attacks by UWT Communication. The submarine is always free to transmit the appropriate code from Table 5-4 to mark an attack. In fact this method is recommended if all participating units are equipped with UWT.
- b. Marking of Short Range Torpedo Firing by Release of a Green Flare/Smoke. The release of a green pyrotechnic signals is a clear and unmistakable way to indicate an attack. However, when helicopters are operating in the vicinity, the submarine is restricted in the use of green flares (Table 5-3, Relaxation 2L and Article 2.2.31 pertain).
- c. Marking of a Simulated Long Range Torpedo Firing by a DEEP FIELD Signal –
  - (1) When the submarine is attacking from such a long range that the unit being attacked is not likely to notice the green flare, nor to be able to clearly interpret the transmissions of UWT attack signals, the submarine is to transmit a DEEP FIELD signal to inform the target that a simulated attack by long range torpedoes has taken place.
  - (2) An unclassified DEEP FIELD Signal with FLASH precedence is to be transmitted on the Weapon Simulation Circuits (as designated in the Order Table for the Exercise) and UWT in the following format:
    - (a) NAWS DE (encrypted call- sign)
    - (b) DEEP FIELD, DEEP FIELD, DEEP FIELD

- (c) TRUE BEARING FROM TARGET
  - (d) GEOGRAPHIC POSITION OF TARGET
  - (e) TARGET BY TYPE AND NAME (encrypted call-sign if known) (f) NUMBER OF TORPEDOES FIRED
  - (g) DTG OF FIRING
- (3) The DEEP FIELD Signal is to be repeated twice, or more if necessary, to ensure that the minimum transmission time is at least 60 seconds.
- d. Marking by a SNIPE Signal of a Simulated Missile Attack -
- (1) An unclassified, FLASH precedence signal is to be made by the submarine using the following format:
    - (a) NAWS DE (encrypted call-sign)
    - (b) SNIPE CHARLIE, SNIPE CHARLIE, SNIPE CHARLIE
    - (c) T R U E BEARING FROM TARGET
    - (d) GEOGRAPHIC POSITION OF TARGET
    - (e) TARGET BY TYPE AND NAME (encrypted) call sign if known
    - (f) NUMBER OF MISSILES FIRED
    - (g) DTG OF FIRING
  - (2) This signal is to be repeated twice or more, if necessary, to ensure that the minimum transmission time is at least 60 seconds.
  - (3) Frequency to be used as in preceding subpara c.(2).
  - (4) In addition to transmitting the SNIPE Signal as above, the submarine has to shine his radar down the firing bearing during the simulated missile flight.

## **5.20 DIVING MESSAGES, SURFACING MESSAGES AND CHECK REPORTS**

ATP-10 lays down the requirement for these messages.

**5.21 ( N M M ) NOT RELEASABLE**

**5.22 - 5.99 SPARE**

Table 5-1. Characteristics of National Submarine Pyrotechnics (NU)

| COUNTRY                    | SMOKE CANDLES/SMOKE BOMBS/<br>SMOKE FLOATS                                                                                                                                                                                                                                                                                | GRENADES (FLARES)                                                                                                                                                        |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| United Kingdom,<br>Germany | White and yellow smoke candles. After ejection from the submarine, the candle floats on the surface, emitting white or yellow smoke for several minutes. White smoke candles also emit flame. Yellow smoke candles are more conspicuous in bad weather but do not emit flame. Only white smoke candles are used by night. | Green, yellow and red grenades (flares) are fired from floats ejected by the submarine and resemble Very lights.                                                         |
| France                     | Calcium Phosphate bombs that float on the surface after ejection and emit white flame and smoke, yellow smoke or green smoke. Certain types leave a green fluorescent stain on the surface.                                                                                                                               | Green and red grenades similar to those above.                                                                                                                           |
| Germany                    | (NMM) NOT RELEASABLE                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                          |
| Italy                      | Smoke candles (without flame) emitting green, yellow and red smoke.                                                                                                                                                                                                                                                       | Green, yellow and red flares. They are fired about 300 feet into the air and float downwards suspended by parachute. They leave a distinct smoke trail and burn about 30 |
| USA, Turkey<br>and Greece  | Smoke candles emitting red, yellow, green and black smoke. Black and green smoke have the same meaning.                                                                                                                                                                                                                   | Green, yellow and red flares as above.                                                                                                                                   |
| Canada                     | Same pyrotechnics as USA and UK.                                                                                                                                                                                                                                                                                          | Same pyrotechnics as USA and UK.                                                                                                                                         |
| Netherlands                | White and yellow smoke candles. (See UK)                                                                                                                                                                                                                                                                                  | Red, yellow and green grenades. (See UK)                                                                                                                                 |
| Norway                     | White and yellow smoke candles.                                                                                                                                                                                                                                                                                           | Red and green flares. They are fired from floats ejected by the submarine and resemble Very lights.                                                                      |
| Portugal                   | Calcium Phosphate bombs that float on the surface after ejection and emit white or yellow smoke and flame. Certain types leave a green fluorescent stain on the surface.                                                                                                                                                  | Green and red flares are fired from floats ejected by the submarine and resemble Very lights.                                                                            |
| Spain                      | White and yellow smoke candles that float on the surface. Only white smoke candles, that also emit flame, are used by night. Certain types leave a green fluorescent stain on the surface.                                                                                                                                | Green, yellow and red flares are fired from floats ejected by the submarine and resemble Very lights.                                                                    |

Table 5-2. Explosive Charge Signals (NU)

| NO. | SIGNAL                               | MEANING                                                                                                    | ACTION BY<br>SUBMARINE<br>IF FULLY<br>SUBMERGED                                                                                                                            | ACTION BY<br>SURFACE<br>SHIPS OR<br>AIRCRAFT                                                     | REMARKS                                                                                                                                                                                  |
|-----|--------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1  | One<br>explosive<br>charge           | (1) Record your course,<br>speed and depth when used<br>by ships or helicopters. An<br>attack carried out. | Records time,<br>course, speed<br>and depth.                                                                                                                               | Records any<br>attack data<br>required.                                                          | Is to be used by<br>ships and aircraft for<br>record purposes when<br>the submarine is not<br>required to indicate its<br>position. Not to be used<br>within one minute<br>of signal A4. |
| A2  | Two<br>explosive<br>charges<br>(QQQ) | (1) Indicate your<br>position if fully submerged.<br><br>(2) Record your course,<br>depth and speed.       | RRR.<br><br>Release an<br>answering<br>smoke/flare other<br>than red.<br><br>Flare must be<br>used during<br>darkness.<br><br>Records time,<br>course, speed<br>and depth. | Acts in<br>accordance<br>with<br>circumstances<br>or the detailed<br>orders for the<br>exercise. | Signal A2 is not to<br>be repeated within two<br>minutes to avoid<br>interfering with Signal<br>A4.                                                                                      |

|    |                               |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                 |                                                                                                                                                                                                         |                                                                                                                                                           |
|----|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| A3 | Three explosive charges (JJJ) | (1) ECB/SLOT Buoy received (if recently sent). Remain at depth.<br><br>(2) Danger. Remain at safe depth.                                                                                                                                                                                                         | RRR.                                                                                                                                                                                            | (1) Ship making signal and other exercise ships close at hand come to safety course and proceed clear of submarine.<br><br>(2) Repeat signal within 15 minutes if submarine is to remain at safe depth. |                                                                                                                                                           |
| A4 | Four explosive charges (CCC)  | COMEX. Indicate the start of ASW action.                                                                                                                                                                                                                                                                         | As directed by orders for the exercise.<br><br>Unless otherwise ordered, the submarine is not to answer this with a smoke/flare.                                                                | As directed by orders for the exercise.                                                                                                                                                                 | The ASW unit initiating the signal is to inform all other cooperating ASW units.                                                                          |
| A5 | Five Explosive Charges (DDD)  | (1) Return to periscope depth and establish tactical radio communications. All clear during the next 10 minutes.<br><br>(2) If repeated two or more times, establish tactical communications as soon as possible. (Aircraft distress or other emergency requiring assistance from the submarine. (See Table 5-8) | RRR.<br><br>(1) Carry out procedures to come to PD or surface. (See Article 2.2.73)<br><br>(2) Establish tactical communications with aircraft or previously designated exercise unit/commander | All warships close at hand proceed clear of submarine's position and steer Safety Course or reciprocal. (See Article 2.2.73.)                                                                           | If ships are in the immediate vicinity, the submarine's position must be known before this signal is made. Signal A2 (or "QQQ") can be used if necessary. |

|     |                          |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                            |                                                                 |                                                                                                                                                                                                                                                  |
|-----|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A6  | Six explosive charges    | <p>a. During exercise operations:</p> <p>(1) FINEX. Indicates completion of ASW action. Establish tactical radio communications (unless otherwise directed in the exercise message).</p> <p>- or -</p> <p>(2) Suspect that you are a non-exercise submarine; communicate with me.</p> <p>b. During SAR operations, position of sunken submarine has been established.</p> | <p>RRR.</p> <p>Exercise submarine proceed to PD or surface and establish communications with aircraft or previously designated unit/commander . If exercise directive indicates to remain submerged for next serial, acknowledge FINEX signal by UWT or ECB/SLOT buoy.</p> | Remain in vicinity.                                             | Charges must not be dropped closer than 500 yards to the submarine.                                                                                                                                                                              |
| A9  | Nine explosive charges   | A Rescue Bell Operation will be attempted.                                                                                                                                                                                                                                                                                                                                | RRR.                                                                                                                                                                                                                                                                       | Remain in vicinity.                                             | Charges must not be dropped closer than 500 yards to the submarine.                                                                                                                                                                              |
| A12 | Twelve explosive charges | <p>Ships are standing by.</p> <p>Safe to abandon submarine.</p> <p>A Rescue Bell Operation will not be attempted.</p>                                                                                                                                                                                                                                                     | RRR.                                                                                                                                                                                                                                                                       | <p>Remain in vicinity.</p> <p>Prepare to pick up survivors.</p> | <p>Charges must not be dropped closer than 500 yards to the submarine.</p> <p>Charges must not be dropped until at least one lifeboat is ready. It is most important that there should be the least possible delay in firing the 12 charges.</p> |

Table 5-3. Submarine Pyrotechnics and SST/UWT Signals by Day and Night (NU)

| NO. | SIGNAL FROM SUBMARINE                                                             |                                                                                                    | ACTION BY ASW<br>UNITS                                                                                                                                                                                             | ACTION BY<br>SUBMARINE                                                                                                   | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | Signal                                                                            | Meaning                                                                                            | AS APPROPRIATE                                                                                                                                                                                                     |                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| B1  | Release one yellow or white flare; three minutes later release second smoke/flare | Keep clear.<br><br>My position is as indicated.<br><br>I intend to carry out surfacing procedures. | Keep clear. If impracticable, order submarine to stay at Safe Depth using Signal A3. By night, switch on navigation lights. Acknowledge with QPQ, Roger smoke or Roger flare as appropriate. (See Article 2.2.73.) | (1) Make TTT followed by safety course and own callsign.<br><br>(2) Carry out surfacing procedure. (See Article 2.2.73.) | <p>A/S ships are to regard either of the following as indicating a submarine intending to surface:</p> <p>(1) Unexpected SST signals (that is, SST signals not in answer to signal in Table 5-2).</p> <p>(2) Pyrotechnic signals not in answer to signal in Table 5-2.</p> <p><b>Note.</b><br/><i>If after 10 minutes neither a second smoke/flare nor submarine has appeared, exercise may be continued. Smoke/ flares are sometimes fired in answer to signals from adjacent areas.</i></p> |

|    |                                                    |                                                        |                                         |                                         |                                                                                                                                                                                                                                                                                                                            |
|----|----------------------------------------------------|--------------------------------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B2 | One green flare or Smoke bomb. (BBB by SST or UWT) | I have fired (or simulated firing) exercise torpedoes. | As directed by orders for the exercise. | As directed by orders for the exercise. | Unless otherwise ordered by OSE, the moment of firing (or simulating firing) the first torpedo should be the moment at which the submarine fires the green flare. The submarine is to fire a green smoke bomb instead of a green flare when helicopters are taking part in the exercise, unless Relaxation 2L is in force. |
| B3 | NOT RELEASABLE                                     |                                                        |                                         |                                         |                                                                                                                                                                                                                                                                                                                            |

# NATO UNCLASSIFIED

MXP-01

|    |                                                                               |                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                           |
|----|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B4 | One red pyrotechnic repeated as often as possible.<br><br>(SOS by SST or UWT) | Keep clear. I am carrying out emergency surfacing procedures, or I am in an emergency and unable to surface/on the bottom. | (1) Break off attacks.<br>(2) Clear immediately the area of the submarine and act in accordance with Articles 2.2.4. and 2.2.73.<br>(3) Switch on navigation lights (night time only).<br>(4) Mark ship's position.<br>(5) Establish Datum based on bearing, time and approximate range of Red or unexpected pyrotechnic.<br>(6) Cavitate.<br>(7) Switch off/recover/ cut decoys.<br>(8) Consider recovering other towed systems (i.e.VDS).<br>(9) Call S/M on UWT (consider minimizing MRS/LFAS or reducing power).<br>(10) Set Watch on SM Safety Net.<br>(11) Broadcast 'Emergency Surfacing' to all units.<br>(12) Inform OCE.<br>(13) Direct all available lookouts to watch datum area.<br>(14) If available, Helicopter/MPA carry out visual search of datum area.<br>(15) Stand By to lay Danbuoy.<br>(16) When considered appropriate attempt to gain MRS contact (consider reduced power).<br>(17) In case of a DEU submarine, secure the pyrotechnics(s) and check for emergency messages(s). | (1) Act as necessary.<br>(2) Make every endeavour to turn to safety course and release smoke/flare.<br>(3) At night, switch on navigation lights. | This signal may also be used by a submarine on the bottom which is unable to surface, in order to indicate that it is in difficulty, and as a means of marking its position. If a red pyrotechnic is released by mistake, the submarine must surface as soon as possible to assure other forces that no emergency exists. |
|----|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 5-4. Underwater Signal Code Table (NU)

**Note.**

1. This signal code is primarily designed for use between ASW ships, helicopters and submarines, but may be employed between aircraft and submarines.
2. Governing pennants (e.g. Negat) are never to be used with this code.

| SIGNAL | MEANING                                                                                                                  |
|--------|--------------------------------------------------------------------------------------------------------------------------|
| ACA    | Keep clear. Do not pass over me.                                                                                         |
| ASA    | Wait. Temporarily discontinue exercise.                                                                                  |
| BBB    | I am simulating firing straight running torpedoes at target vessel. (May be followed by the call sign of target vessel). |
| BLR    | I am firing a long range standoff weapon. (May be followed by target vessel call sign.)                                  |
| BNN    | NOT RELEASABLE                                                                                                           |
| BNS    | NOT RELEASABLE                                                                                                           |
| BRS    | I am simulating firing a long range standoff weapon. (May be followed by target vessel call sign.)                       |
| CCC    | COMEX                                                                                                                    |
| DDD    | Return to periscope depth and establish tactical radio communications. All clear during the next 10 minutes.             |
| FFF    | Change speed (followed by numerals to indicate new speed).                                                               |
| * FFT  | Open to attack. Torpedo may be fired in accordance with exercise orders.                                                 |
| GGG    | Change base course (followed by numerals to indicate new course).                                                        |
| HHH    | I am firing or I have fired ... torpedoes (followed by numerals to indicate number of torpedoes fired).                  |
| * ICI  | Open to attack. Torpedoes are not to be fired.                                                                           |
| III    | I have lost contact. Send Vs.                                                                                            |
| * IPI  | No torpedoes sighted. Surface when safe to do so and proceed to search.                                                  |
| JJJ    | (1) ECB/SLOT Buoy received (if recently sent),<br>- or -<br>(2) Danger, remain at safe depth.                            |
| KKK    | I am at correct depth, course and speed and am ready to commence the exercise.                                           |
| LLL    | Change depth to that indicated by the following numerals ....; Take exercise depth.                                      |
| MMM    | I have sighted torpedo. (If followed by numerals, indicates number of torpedoes sighted.)                                |
| MUT    | My Underwater Telephone is inoperative.                                                                                  |
| NNN    | I am unable to comply with your last signal.                                                                             |
| * NON  | Submarines are not to attack.                                                                                            |
| OAB    | Your bearing at the attack time is ... (followed by numerals to indicate bearing)                                        |
| OAC    | Your course at the attack time is ... (followed by numerals to indicate course)                                          |

**Note.**

*\*Submarine torpedo attack signals to be used in conjunction with procedure outlined in Article 5.15.*

|       |                                                                                                                                                                                                             |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OAD   | Your depth at attack time is ... (followed by numerals to indicate depth)                                                                                                                                   |
| OAR   | Your range at attack time is ... (followed by numerals to indicate range)                                                                                                                                   |
| OAS   | Your speed at attack time is ... (followed by numerals to indicate speed)                                                                                                                                   |
| OAT   | Attack time is ... (followed by numerals to indicate time)                                                                                                                                                  |
| OOH   | I am firing flight delivered torpedo.                                                                                                                                                                       |
| OON   | NOT RELEASABLE                                                                                                                                                                                              |
| OOO   | I am simulating firing homing torpedo (followed by bearing of the target but may also be followed by call-sign of the target vessel).                                                                       |
| OOW   | I am simulating firing wire guided torpedo. (May be followed by call-sign of target vessel.)                                                                                                                |
| PPP   | Prepare to surface or to come to periscope depth.                                                                                                                                                           |
| QAP   | Listen for me on ordered radio frequency (or KC).                                                                                                                                                           |
| QPQ   | Pyrotechnic/smoke sighted (bearing ....).                                                                                                                                                                   |
| QQQ   | Fire (or fired) smoke/flare to indicate position.                                                                                                                                                           |
| QRS   | Send slower.                                                                                                                                                                                                |
| QRZ   | You are being called by.....                                                                                                                                                                                |
| QSY   | Shift to another frequency.                                                                                                                                                                                 |
| QSZ   | Send each group twice.                                                                                                                                                                                      |
| QTE   | Your true bearing is (degrees) at (time); or What is my true bearing from you?                                                                                                                              |
| RLR   | Repeat last run.                                                                                                                                                                                            |
| RRR   | Received last transmission or message.                                                                                                                                                                      |
| SOS   | Emergency; I desire to surface (or I am surfacing).                                                                                                                                                         |
| SSS   | I am firing simulated or practice ASW weapon:<br><br><b>Plus long dash</b> (end of long dash is instant of firing).<br><br><b>Second dash</b> (submarine sends water slug/smoke filters at time indicated). |
| SXS   | Stop the attack. Exercise cancelled. Surface when safe to do so.                                                                                                                                            |
| TAS   | I have streamed Critical-Angle Towed Array System.                                                                                                                                                          |
| TRT   | Steer Safety Course.                                                                                                                                                                                        |
| * TSX | Torpedo or torpedo track in sight; carry on with the exercise.                                                                                                                                              |
| TTT   | I desire to surface (not an emergency).                                                                                                                                                                     |
| TXT   | Cease present exercise; further instructions follow.                                                                                                                                                        |
| UJO   | (NMM) NOT RELEASABLE                                                                                                                                                                                        |
| UUU   | You are standing into danger.                                                                                                                                                                               |

**Note.**

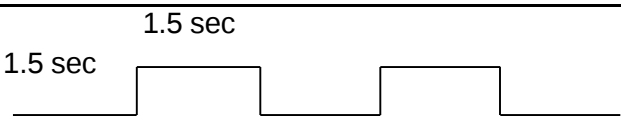
*\*Submarine torpedo attack signals to be used in conjunction with procedure outlined in Article 5.15.*

|     |                                                                                                                                                                                       |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VAA | Course and speed of indicated YBA or YBB ship is ... (followed by numerals to indicate course and speed).                                                                             |
| VAC | My course is ... (followed by numerals to indicate course).                                                                                                                           |
| VBS | My speed is ... (followed by numerals to indicate speed).                                                                                                                             |
| VCD | My depth is ... (followed by numerals to indicate keel depth in metres).                                                                                                              |
| VDM | My VDS/DTAS is being towed outside allocated depth limits and is at (followed by numerals to indicate keel depth in metres).                                                          |
| VDS | I have streamed VDS or DTAS. (May be followed by numerals to indicate cable length in metres (feet), depending on the Relaxation in force.)                                           |
| VFM | Stand by for range by method Mark - Snap (UWT) (see Table 5-9).                                                                                                                       |
| VFR | Your range is ... (followed by numerals to indicate range in yards).                                                                                                                  |
| VLN | Cavitate for bearing.                                                                                                                                                                 |
| VPO | I am coming to periscope depth.                                                                                                                                                       |
| VQC | What is your present course?                                                                                                                                                          |
| VQS | What is your present speed?                                                                                                                                                           |
| VRD | What is your present depth?                                                                                                                                                           |
| VRR | I have detected you by radar.                                                                                                                                                         |
| VRS | I have detected you by sonar.                                                                                                                                                         |
| VSS | I see you.                                                                                                                                                                            |
| VVV | This is my position and I am resuming base course and speed (repeated several times for sonar location).                                                                              |
| WSN | Your air bubble not sighted. Use more air.                                                                                                                                            |
| WWW | Release air bubble or turn on underwater/navigation lights to indicate position.                                                                                                      |
| XXA | I am at periscope depth.                                                                                                                                                              |
| XXX | Come to periscope depth.                                                                                                                                                              |
| YBA | Fishing vessel or boat engaged in underwater activities is in the immediate area. (May be followed by numerals to indicate true bearing and range from submarines.)                   |
| YBB | Ship with draught expected to exceed the draught assumed for this exercise is in the immediate area. (May be followed by numerals to indicate true bearing and range from submarine.) |
| YBC | Exercise ship in immediate area.                                                                                                                                                      |
| YYY | Non-exercise ship is in immediate area. (May be followed by numerals to indicate true bearing from submarine.)                                                                        |
| ZPZ | Snorkel (followed by numerals to indicate speed).                                                                                                                                     |
| ZZZ | I am out of action in accordance with umpire rules.                                                                                                                                   |

**Note.**

*\*Submarine torpedo attack signals to be used in conjunction with procedure outlined in Article 5.15.*

Table 5-5. ESUS MK 84 Underwater Signal Code (NU)

| CODE                                                                                               | MEANING                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ONE</b><br>    | ATTACK/COMEX Signal                                                                                                                                                                                                                                                                                         |
| <b>TWO</b><br>    | (1) ECB/SLOT Buoy received (if recently sent) – or -<br>(2) Remain at Safe Depth                                                                                                                                                                                                                            |
| <b>THREE</b><br>  | (1) Return to periscope depth and establish tactical radio communications. All clear during the next 10 minutes. – or -<br>(2) If repeated two or more times, establish tactical communications as soon as possible. (Aircraft distress or other emergency requiring submarine assistance.) (See Table 5-8) |
| <b>FOUR</b><br> | (1) FINEX. Indicates completion of ASW action. Establish tactical radio communications (unless otherwise directed in the exercise message). - or -<br>(2) Suspect that you are a non-exercise submarine, communicate with me by any means.                                                                  |
| <b>FIVE</b><br> | (1) Fishing vessel within 4000 yards, return to PD as soon as safe to do so and establish VHF communications (on assigned channel).                                                                                                                                                                         |
| Available in MK 84 MOD 1 only. Steady tone (high frequency F-2).                                   |                                                                                                                                                                                                                                                                                                             |

**Notes.**

1. The ESUS MK 84 transmits on two primary frequencies:  $f_1$  of 3.2kHz and  $f_2$  of 3.5kHz.  $F_2$  must be at least 3% greater than  $f_1$  to ensure that the operators can differentiate between the two frequencies.  $F_1$  must be greater than 2.95kHz and  $f_2$  must not be greater than 3.55kHz.

a. The adjacent code illustrations indicate the high and low frequency shifts; the amplitude (or signal level) remains the same.

b. The pulse lengths are 0.5 sec and 1.5 sec.

c. The codes are repeated until the battery is exhausted (45-120 sec).

2. Exercise codes of Table 5-5 are to be used for all training evolutions unless, during support submarine or air/sub cooperation exercises, one side or the other is required to employ separate operational codes. If so, the OCE must specify ESUS Code FOUR application for each opposing force to avoid any unit misinterpreting FINEX for some other code meaning.

Table 5-6. Ship/Submarine Torpedo Attack (NU)

| DESCRIPTION                                      | USED BY                          | MEANING                                                                                                                                                                           |
|--------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flag FOUR over Flag SEVEN (Displayed both sides) | Target Ship for Submarine Attack | Open to attack by submarines. Torpedoes may be fired in accordance with orders for the exercise. (See Note below.)                                                                |
| Flag FOUR over Flag FOUR (Displayed both sides)  | Target Ship for Submarine Attack | Open to attack by submarines. Torpedoes must not be fired. (See Note below.)                                                                                                      |
| Flag QUEBEC                                      | Submarines                       | 1. Disregard me. I am not open to attack. I am not to be reported.<br><br>- or -<br><br>2. Disregard me. I am participating in EVENT SUBMISS/SMASHEX as part of the Search Force. |

**Note.**

See Signals in Table 5-4 denoted \*.

Table 5-7. Signals by Aircraft (NU)

| MANOEUVRE                                                                                                                                                                           | MEANING                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Lateral movement of wings (rocking wings)                                                                                                                                           | Roger - I have received your last message or signal.                                               |
| Gentle dive along course of submarine. Aircraft are not to descend below 200 feet by day or below 500 feet by night. Navigation and anti-collision lights are to be shown at night. | Start or recommence exercise. Time of aircraft passing overhead is GO TIME or COMEX as applicable. |
| Gentle dive along reverse course of submarine. Altitude restrictions and light instructions above apply.                                                                            | Stop exercise. (STOP TIME or FINEX as applicable.)                                                 |
| Series of gentle dives and climbs while orbiting (Porpoising)                                                                                                                       | Wait                                                                                               |
| Sharp turn to starboard                                                                                                                                                             | Spare                                                                                              |
| Sharp turn to port                                                                                                                                                                  | Spare                                                                                              |

Table 5-8. Aircraft Distress Signals (NU)

| NATURE OF AIRCRAFT EMERGENCY                                                     | SIGNAL BY AIRCRAFT                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                              | ACTION BY AIRCRAFT                                                                                                                                                                                                                                                         | ACTION BY SHIP OR SURFACED SUBMARINE                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                  | TO SHIP OR SURFACED SUBMARINE                                                                                                                                                                                                                                                                                                                                                                        | TO SURFACE A SUBMERGED SUBMARINE                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                           |
| DISTRESS - Grave imminent danger threatens and immediate assistance is required. | Fire one red flare or a succession of red flares singly at short intervals directed near ship or submarine.<br><br>Aircraft not carrying flares or without multiple flare-dispensing capability, conduct low pass close aboard surface unit with all navigation/landing lights on steady while rocking wings and transmitting Morse letter Zulu (dash- dash-dot-dot) by Aldis lamp or blinker light. | Fire five explosive charges two or more times at short regular intervals*. (See Signal A5, Table 5-2)<br><br>Two or more MK 84 Code 3 buoys can be dropped simultaneously in lieu of explosive charges. (See Table 5-5)<br><br><b>These signals should be used only if no participating naval ships are in the vicinity.</b> | If time permits, inform ship by radio or visual signals of the following:<br><br>1. Identity.<br><br>2. Intention, i.e. ditching, abandoning aircraft, or deferred landing (see emergencies 1, 2 and 3 below).<br><br>3. Position and time.<br><br>4. Assistance required. | Inform OSE and/or appropriate Rescue Coordination Centre (RCC) giving:<br><br>1. Identity of aircraft.<br><br>2. Nature of distress.<br><br>3. Aircraft position and time.                                                                                                                                                                |
| 1. Ditching                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                              | Land in sea near ship or submarine. Switch on navigation lights by night.                                                                                                                                                                                                  | Man boats equipped with rescue gear and maneuver ship as necessary to permit earliest rescue operations. Some aircraft are equipped with a Sonar Locator Beacon (SLB). Were an aircraft to sink after ditching, the SLB is depth activated, and transmits on 9.5 Khz (pulse length 14 msec, repetition rate 1 pulse per sec) for 10 days. |

|                                                   |  |  |                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>2. Abandon aircraft by parachute</p>           |  |  | <p>Position aircraft in order that personnel may bail out as near as possible to the ship or submarine, and from an upwind direction if practicable.</p>                                                                                                | <p>Manoeuvre ships so as to be in the centre of landing area of parachuting personnel, with boats manned and lookouts posted in preparation for rescue of personnel.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>3. Deferred forced landing on or near land</p> |  |  | <p>Inform ships of additional information, viz.</p> <p>a. Endurance remaining.</p> <p>b. Point of intended landing.</p> <p>If practicable, pass over ship or submarine en route to point of intended landing. Switch on navigation lights by night.</p> | <p>Follow aircraft, as navigation permits, with rescue boats manned for immediate launching. At closest approach point, dispatch properly manned boats to effect landing on shore and assist in rescue of aircraft personnel. Notify OSE and/or appropriate Rescue Coordination Centre giving additional information as below:</p> <p>1. Endurance remaining.</p> <p>2. Point of intended landing.</p> <p>Notify of details of actual landing when available.</p> <p>N.B. In cases where aircraft is unable to pass any information other than the distress signal by itself, ships or surfaced submarine should prepare to mount rescue operations as required, informing OSE and/ or appropriate Rescue Coordination Centre.</p> |

|                                                                                                                             |                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                       |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p><b>URGENCY -</b><br/>Aircraft in difficulties which compel it to land without immediate assistance.</p>                  | <p>Succession of white flares.</p> <p>Aircraft not carrying flares or without multiple flare dispensing capability fly left-hand racetrack pattern perpendicular to surface unit's track, passing overhead the surface unit, while flashing navigation/landing lights.</p>                                                        | <p>Fire five explosive charges two or more times at short regular intervals*. (See Signal A5, Table 5-2)</p> <p>Two or more MK 84 Code 3 buoys can be dropped simultaneously in lieu of explosive charges. (See Table 5-5)</p> <p><b>These signals should be used only if no participating naval ships are in the vicinity.</b></p> | <p>Inform ship by radio or visual signals of the following:</p> <ol style="list-style-type: none"> <li>1. Identity.</li> <li>2. Nature of distress.</li> <li>3. Aircraft position and time.</li> <li>4. Endurance.</li> <li>5. Intentions.</li> </ol> | <p>Render any assistance possible. Inform OSE and/or Rescue Coordination Centre.</p> |
| <p>Aircraft has a very urgent message to transmit concerning the safety of a ship, aircraft or other person or vehicle.</p> | <p>Succession of green flares.</p> <p>Aircraft not carrying flares or without multiple flare dispensing capability fly left-hand circular pattern around surface unit with all navigation lights on steady while rocking wings and transmitting Morse letters Mike Mike (dash-dash-dash-dash) by Aldis lamp or blinker light.</p> | <p>Fire five explosive charges two or more times at short regular intervals*. (See Signal A5, Table 5-2)</p> <p>Two or more MK 84 Code 3 buoys can be dropped simultaneously in lieu of explosive charges. (See Table 5-5)</p> <p><b>These signals should be used only if no participating naval ships are in the vicinity.</b></p> | <p>Transmit message by radio or visual signals.</p>                                                                                                                                                                                                   | <p>Relay message or act as required.</p>                                             |

Table 5-9. Range by Method MARK-SNAP (NU)

Having established communication by UWT, **Ship "A"**, wishing to carry out ranging by Method MARK - SNAP, makes:

"Stand by for range check."

**Ship "B"** when ready makes:

"Ready."

**Ship "A"** makes:

"5-4-3-2-1 MARK" (Starting a chronoscope on the word "MARK")

When **Ship "B"** hears the count-down he makes:

"SNAP" at the same time as "MARK" from Ship "A" is anticipated, and starts his chronoscope.

**Ship "A"** makes:

"MARK" on hearing "SNAP" from Ship "B", and stops his chronoscope.

**Ship "B"** stops his chronoscope on hearing the second "MARK" from Ship "A".

Ships then exchange ranges.

**Note.**

*Count-down from Ship "A" must be made at an even cadence so that "MARK" can be anticipated by Ship "B"*

**INTENTIONALLY BLANK**

## CHAPTER 6

### RECORDS AND ANALYSIS

#### 6.1 GENERAL CONSIDERATIONS

6.1.1. (NU) It is of the utmost importance that submarine and anti-submarine warfare exercises should be analyzed in order to establish any errors in procedure or drill and to allow the formulation of new and improved techniques. Such analysis will also enable a senior officer to assess the efficiency of his forces. (The value of post-exercise discussions is covered in Article 1.4.)

6.1.2. (NU) In order to permit satisfactory analysis, it is of the utmost importance that track charts and records should be neatly and accurately produced. Track charts should include the direction of true North, the scale of the chart, the appropriate latitude and longitude scale (where possible), a geographic reference point, COMEX/FINEX times, and the name and hull number of the submitting command.

6.1.3. (NU) The analysis of ASW exercises falls into two broad categories which are discussed in the following articles:

- a. Analysis or assessment of weapon attacks; and
- b. Tactical analysis.

#### 6.2 ANALYSIS OR ASSESSMENT OF WEAPON ATTACKS

6.2.1 (NU) ASW **Ships**. Two methods are available to assist in evaluating the effectiveness of surface ship attacks:

- a. **Method A - Recording of Attack and Submarine Data.** This method may be the most suitable for long range attack systems or when it is not desired to compromise the submarine's position by requiring it to fire a smoke flare.
  - (1) **The surface ship** sends the appropriate signal by explosive charge signal, SST, or UWT, at the time of firing its weapon(s) and records the target data used (that is, submarine's estimated course, speed and depth).
  - (2) **The submarine**, on receipt of the signal, records its course, speed, and depth, together with any changes during the anticipated time flight of the weapon.

- b. **Method B - Marking the Position of Submarine and Weapon.** This method is best suited for evaluation of short range weapon attacks, where there is no objection to compromising the submarine's position.
- (1) **The surface ship** fires (or drops a marker on the surface which is related to the position at which the weapon or projectiles would enter the water) and makes the appropriate signal by explosive charge, SST, or UWT to alert the submarine to fire smoke/ flare or bubble.
  - (2) **The submarine** marks its position by smoke/flare or bubble, subject to any time delay in use, and records time, course, speed and depth. This information is to be passed in the submarine vectored attack (SUBVEC) message format given below:

|                                                                                      |               |
|--------------------------------------------------------------------------------------|---------------|
| IDENTIFIER (SUBVEC Serial No./Run No.) Passed as:                                    | SUBVEC.../... |
| TIME of attack (second charge heard)                                                 | A.....        |
| BEARING of submarine from smoke candle at second charge                              | B.....        |
| DISTANCE in yards of submarine from smoke candle at charge                           | C.....        |
| COURSE of sub marine at second charges                                               | D.....        |
| Speed of submarine to nearest half knot                                              | E.....        |
| DEPTH of submarine keel in meters (feet)<br>(Units of measurement must be specified) | F.....        |

**Note.**

*This system is subject to errors caused by the smoke/flare being washed aft, which increases submarine speed or depth up to a maximum of 40 yards.*

6.2.2. (NU) ASW **Aircraft.** During ASW attacks by aircraft, attack positions should be marked, when practicable, to permit the results to be assessed. The procedure for marking attacks aims to provide a visual representation of the result and is conducted as follows:

- a. **The aircraft** marks the position of the attack using underwater charges, smoke combs, markers, and so forth. It should be noted, however, that since attacks using a single charge (Signal A1 or ESUS Mk84 code one) are not answered by the submarine, a visual aiming point is necessary to allow the assessment or analysis of such attacks.

- b. In reply to an attack in which two charges have been used, the submarine releases an answering smoke/flare, other than red, to indicate its position.

## 6.3 TACTICAL ANALYSIS

6.3.1. (NU) When so ordered, ships, aircraft and submarines taking part in tactical exercises are to record such information as is required for preparing an accurate account of the exercises for use at a post exercise conference and/or for preparing a general report on the exercises.

6.3.2. (NU) The OCE will promulgate in the relevant OPOD or CASEX message a list of FORMEX and/or CASEX forms specifically required. Figures 6-1 to 6-4 illustrate the CASEX forms that may be used. Examples and instructions for completing FORMEXes that may be required are in the Maritime Analysis Handbook.

6.3.3. (NU) In addition to other forms required for record keeping which must be ordered in the CASEX message, the submarine is to forward the following records to the ship or other specified authority on completion of the exercise:

- a. Narrative (FORMEX 101);
- b. Contact Evaluation Plot (CEP) (FORMEX 116);
- c. Range Evaluation Plot (REP) if kept;
- d. Ship Position Plot (AUTOLOG print out) (FORMEX 114);
- e. Machinery Log; and
- f. Artifact Log.

## 6.4 CLAIMS FOR ATTACKS BY SUBMARINES OR ASW SHIPS

6.4.1. (NU) The following message is available to enable attacking units to claim their attacks. Claim message (ME - YOU) may be made by the appropriate communication method, as described in the paragraphs which follow:

- a. **Message from Attacking Unit.** The attacking unit is to send as follows:
  - (1) The target attacked, and its estimated course and speed,
  - (2) The number of weapons that have or would have been fired, followed by the word **Fired** or **Dummy**,

- (3) The mean course or bearing on which weapons would have been set to run,
  - (4) Estimated range on firing, and running range/time where appropriate (in hundreds of yards or seconds),
  - (5) Time interval between consecutive firings a salvo,
  - (6) DTG of firing, and
  - (7) Estimated position of target unit.
- b. This information is to be made by the attacking unit in accordance with the following example: "YOU 180-12-2 FIRED ME 090-12-30-13-250925Z." This would mean, "I estimated your course to be 180 degrees at 12 knots when I fired. Two weapons have been fired, their mean course was 090 degrees, my estimated range on firing was 1200 yards and their running range is 3000 yards. The interval between consecutive firings in the salvo was 13 seconds. I fired at 250925Z."
- c. **Message from the Attacked Unit.** The attacked unit is to reply to the ME - YOU message with a message concerning relevant courses, speeds and times. Information to be made by the attacked unit in accordance with the following example:

ME 175 – 15 – 250910Z 185 - 12

This would mean: During the ASW attack period my course was 175 at 15 knots until 0910Z and from then onwards my course was 185 at 12 knots.

## 6.5 SUBMARINE TRACK MESSAGE

6.5.1. (NU) The Submarine Track Message is designed to provide a method by which accurate and concise records of an exercise submarine's movement and operating events can be exchanged with participating units following a short term action period. These records are required to provide for a rapid post exercise analysis.

6.5.2. (NU) The Submarine Track Message is a numerical method of recording the submarine's movement during each exercise serial. It employs a grid system based on initial position coded as 500

500, and measure displacement in hundreds of yards East-West and North-South from the initial position. The first group indicates displacement East-West; the second group displacement North- South. Displacements East and North of the initial position will be added

to and displacements West and South of the initial position will be subtracted from 500. To indicate the time of each position reported, a third group is included. The first figure denotes the last figure of the hour and the last two figures denote the time in minutes of the hour.

**Example:** Time 1435, position 4100 yards East and 3600 yards South of the Initial position, would encode as 541 464 435.

6.5.3. (NU) On reaching 50,000 yards from the initial position in either an East-West or North-South direction, the numbering sequence for that particular direction will revert to 500. The sequence should never be allowed to progress to a four figure group.

6.5.4.(NU) At COMEX, the submarine will note the latitude and longitude and include this information at the beginning of the Track report. The submarine is to record its position whenever an alteration of course is made, and on the hour, or, is to record its position every 10 minutes, whichever is more convenient.

6.5.5. (NU) To assist in analysis, the submarine is to report pertinent operating events using the Brevity Code, Table 6-1. The letter designator is to be included after the three group position report. More than one designator may be used.

6.5.6. (NU) The last group of the track message is to be the position in which the submarine surfaces; the group is to be preceded by the words "SURFACING POSITION".

**Example:** TO C/S FM C/S COMEX POSIT 3150N 6410W 500 475 430 GD37/496 461 435 J/492 472 444C/490 454 500/500 430 503 VS 00010/500 400 525 SEA 280/ ETC.

**Meaning:** To participating Unit from Submarine  
COMEX 3150N 6410W. 500 475 AT 1430Z GO TIME DIVED TO  
DEPTH 37 METERS POSITION 496 461 AT 1435Z DETECTED JULIE.  
POSITION 492 472 TIME 1444Z COMMENCED SNORKELLING. POSITION  
490 454 AT 1500Z ON THE HOUR POSITION. POSITION 500 430 AT 1503Z  
SIGHTED SHIPS BEARING 000 AT 10 MILES. POSITION 500 400 TIME  
1525Z SECURED SNORKELLING AIRCRAFT RADAR INTERCEPTED  
BEARING 280, ETC.

## 6.6 DATA FORMS

(NU) The authority requiring records is to order those required, for analysis and subsequent reporting, from the Major NATO Commanders' Exercise Directives Volume IV, CASEX forms A, B, C and D and National Forms.

**6.7 (NMM) NOT RELEASABLE**

**6.8 - 6.99 Spare**

Table 6-1. Brevity Code (NU)

| LETTER<br>DESIGNATION | EVENT MEANING                                                                     |
|-----------------------|-----------------------------------------------------------------------------------|
| A                     | Began out-of-action.                                                              |
| B                     | End out-of-action.                                                                |
| C                     | Commenced snorkeling.                                                             |
| D                     | Dived, to be followed by numerals indicating depth in meters (tens of feet).      |
| EA                    | Electronic emission information from aircraft bearing in true three figure group. |
| ES                    | Electronic emission information from ships bearing in true three figure group.    |
| F                     | Running on surface.                                                               |
| G                     | GO TIME.                                                                          |
| H                     | HF transmission from submarine.                                                   |
| M                     | Missile fired.                                                                    |
| N                     | Changed depth, to be followed by numerals indicating depth in meters (tens of     |
| R                     | Radar transmission from submarine.                                                |
| S                     | Secured snorkeling (routine).                                                     |
| SEA                   | Secured snorkeling (aircraft radar intercepted). Bearing true.                    |
| SES                   | Secured snorkeling (ship's radar intercepted). Bearing true.                      |
| SVA                   | Secured snorkeling (aircraft visual).                                             |
| SVS                   | Secured snorkeling (ship visual).                                                 |
| SS                    | Secured snorkeling (ship HE bearing true).                                        |
| T                     | Torpedo fired with target's course and speed in five figure group.                |
| VA                    | Visual sighting aircraft.                                                         |
| VS                    | Visual sighting ships, with bearing and range (in miles) in five figure group.    |
| W                     | Initiated action enables aircraft to regain contact.                              |

**Note.**

*All bearings are True.*

Table 6-2. ( N M M ) NOT RELEASABLE

Figure 6.1. CASEX Form A – A/S Ship/Target Ship Record Form NU)

| CASEX FORM A--A/S SHIP/TARGET SHIP RECORD FORM                                                |          |        |                        |       |                                         |                        |
|-----------------------------------------------------------------------------------------------|----------|--------|------------------------|-------|-----------------------------------------|------------------------|
| SECTION I -- GENERAL INFORMATION                                                              |          |        |                        |       |                                         |                        |
| Name of Ship _____                                                                            |          |        |                        |       |                                         |                        |
| CASEX Number or description of the exercise _____ Date _____                                  |          |        |                        |       |                                         |                        |
| Time zone used in report _____                                                                |          |        |                        |       |                                         |                        |
| Weather _____ Sea State _____ Visibility _____                                                |          |        |                        |       |                                         |                        |
| Position in formation of A/S ship or ship acting as submarine target _____                    |          |        |                        |       |                                         |                        |
| Layer depth (measured from surface to top of layer) _____                                     |          |        |                        |       |                                         |                        |
| Temperature drop in layer _____                                                               |          |        |                        |       |                                         |                        |
| Predicted sonar range _____                                                                   |          |        |                        |       |                                         |                        |
| Observed Sonar Range _____                                                                    |          |        |                        |       |                                         |                        |
| SECTION II - NAVIGATIONAL RECORD DURING A/S ACTION OR WHEN A TARGET SHIP FOR SUBMARINE ATTACK |          |        |                        |       |                                         |                        |
| Time                                                                                          | Own Ship |        | Contact with Submarine |       |                                         | Position and Remarks** |
|                                                                                               | Course*  | Speed* | Bearing                | Range | Estimated Course and Speed of Submarine |                        |
|                                                                                               |          |        |                        |       |                                         |                        |

\* Own ship's course and speed need not be recorded during A/S actions.

\*\* Remarks column is to include (1) times of sighting or hearing signals from Table 5-3 or Table 5-4, (2) times of making signals laid down in Tables 5-2, 5-4, or 5-5 or 5-6, and (3) own geographic positions.

**EDITION E VERSION 7**

Figure 6.2. CASEX Form B – Fixed Wing Aircraft Antisubmarine Sortie Report (NU)

| CASEX FORM B—FIXED WING AIRCRAFT ANTI-SUBMARINE SORTIE REPORT                                                                                                                                                          |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------|----------------------------|--------|----------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------|--------|--------------|
| CASEX Number or description of the exercise                                                                                                                                                                            |               |                                |                            |        | Date                                                                       |                    |                                                                               |        |              |
| <b>SECTION I--AIRCRAFT DETAILS</b>                                                                                                                                                                                     |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| Base or Parent Ship                                                                                                                                                                                                    | Squadron      | Aircraft Type                  |                            |        | Aircraft Number, Letter, or Callsign                                       | Aircraft Commander |                                                                               |        |              |
|                                                                                                                                                                                                                        |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| <b>SECTION II--SORTIE TIMES</b>                                                                                                                                                                                        |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| Airborne (DTG)                                                                                                                                                                                                         | On Task       |                                |                            |        | Off Task                                                                   |                    |                                                                               |        | Landed (DTG) |
|                                                                                                                                                                                                                        | Ordered       | Actual                         | Punctuality                | Reason | Ordered                                                                    | Actual             | Punctuality                                                                   | Reason |              |
|                                                                                                                                                                                                                        |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| To include types of searches or patrols carried out, area covered, and details of any deviations from the ordered task.                                                                                                |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| * This form is intended for use in peace and wartime exercises. Section VII (Submarine Detection and Attack Report) is to be answered at the discretion of the commanding officer and the form classified accordingly. |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| <b>SECTION IV--NARRATIVE OF SORTIE</b>                                                                                                                                                                                 |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| To include all important incidents, sightings of own or enemy forces, and narrative of attack with positions and times.                                                                                                |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| <b>SECTION V--UNSERVICEABILITY OF EQUIPMENT</b>                                                                                                                                                                        |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| To include unserviceabilities to aircraft, radio, underwater tracking equipment, and so forth.                                                                                                                         |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| <b>SECTION VI--DISAPPEARING RADAR CONTACTS</b>                                                                                                                                                                         |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |
| Time                                                                                                                                                                                                                   | Type of Radar | Geographic Position of Contact | Relative Bearing and Range |        | Classification of Contact (Positive, Probable, Possible, or Non-submarine) |                    | Underwater Detection and Tracking Equipment Used and Results (see Section IV) |        |              |
|                                                                                                                                                                                                                        |               |                                |                            |        |                                                                            |                    |                                                                               |        |              |

| CASEX FORM B (Cont'd)                                                                                               |                |                 |
|---------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
| <del>SECTION VII--SUBMARINE DETECTION AND ATTACK REPORT</del> -----                                                 |                |                 |
| a. Initial Detection and Sighting                                                                                   | First Sighting | Second Sighting |
| 1. Time and position of initial contact                                                                             |                |                 |
| 2. Relative bearing and range from aircraft                                                                         |                |                 |
| 3. First detected by _____ (visual, radar, sonobuoys, ESM, and so forth, including type of radar or equipment used) |                |                 |
| 4. If visual, was radar being used? If not, give reason                                                             |                |                 |
| 5. Altitude of aircraft                                                                                             |                |                 |
| 6. Nature of first visual sighting (surfaced, snorting, periscope depth, and so forth)                              |                |                 |
| 7. Contact gained by _____ (position in aircraft)                                                                   |                |                 |
| 8. Aspect of submarine when first sighted (beam on, bow or stern on, and so forth)                                  |                |                 |
| 9. Estimated course and speed of submarine on sighting                                                              |                |                 |
| 10. Was submarine sighted in daylight, darkness, moonlight, or twilight?                                            |                |                 |
| 11. Was sighting up or down sun or moon?                                                                            |                |                 |

| CASEX FORM B (Cont'd)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | First Sighting | Second Sighting |
| <u>a. Initial Detection and Sighting (Cont'd)</u><br>12. Was sighting by means of illuminants? If so give:<br>(a) Type of illuminant<br>(b) Distance from submarine illumination was used<br>(c) Position of illumination relative to target during the attack run<br>(d) Height of aircraft at time of illumination<br>(e) Was illumination adequate? If not, give details.<br><br>13. Bearing and distance of submarine from combatant force, convoy or ship<br><br>14. If sonobuoy contact, number and position of buoys holding contact<br><br>15. Hydrophone depth of sonobuoy<br><br>16. Length of time contact held<br><br>17. Time taken to classify<br><br>18. Predicted detection range<br><br>19. Distance of target from sonobuoy, if known<br><br>20. BT data obtained |                |                 |
| <u>b. Action by Aircraft</u><br><br>1. Was submarine attacked? (See Section IX below.)<br><br>2. Reason if no attack was made<br><br>3. Was underwater tracking equipment used? (See Section IX below.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |

| CASEX FORM B (Cont'd)                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | First Sighting | Second Sighting |
| <u>c. Cooperation with Surface Ships</u><br>1. Action taken to home A/S ships<br><br>2. Reason for failure to contact or home A/S ships<br><br>3. Identity of ships contacted<br><br>4. Time of arrival and identity of ships homed to the datum                                                                                                                                                                                |                |                 |
| <u>d. Cooperation with Other Aircraft</u><br>1. Did any other aircraft cooperate? Give details and times (If VECTACs were carried out, see subsection g below)<br><br>2. Was sighting aircraft relieved, or did it leave before being relieved? If so, why?                                                                                                                                                                     |                |                 |
| <u>e. Underwater Tracking</u><br>1. Time of laying first buoy<br><br>2. Was positive contact made?<br><br>3. Length of time contact was held<br><br>Notes: The following information should be shown on the plotting grid in Section IX:<br>(a) Sonobuoys (details of pattern(s) laid, position(s) of Master Buoy(s), distance of other buoys, and extensions)<br>(b) Description of results, and plot of submarine's movements |                |                 |
| <u>f. Weather Conditions at Time of Sighting or Attack</u><br>1. General weather (fair, fine, rain, and so forth)<br><br>2. Visibility at patrol height                                                                                                                                                                                                                                                                         |                |                 |

| CASEX FORM B (Cont'd)                                                                                     |  |                |       |                 |       |
|-----------------------------------------------------------------------------------------------------------|--|----------------|-------|-----------------|-------|
| f. <u>Weather Conditions at Time of Sighting or Attack</u> (Cont'd)                                       |  | First Sighting |       | Second Sighting |       |
| 3. Cloud type, base, amount below 5000 feet, and total amount                                             |  |                |       |                 |       |
| 4. Moon, phase, altitude, and azimuth                                                                     |  |                |       |                 |       |
| 5. Wind direction and speed                                                                               |  |                |       |                 |       |
| 6. Sea state                                                                                              |  |                |       |                 |       |
| g. <u>Attack Report</u>                                                                                   |  | Run 1          | Run 2 | Run 3           | Run 4 |
| 1. Time and position of attack                                                                            |  |                |       |                 |       |
| 2. Attack approach (direct, manoeuvring in cloud, down sun, up moon, and so forth)                        |  |                |       |                 |       |
| 3. Was target visible at time of attack? If not, what was aiming point?                                   |  |                |       |                 |       |
| 4. Angle of attack relative to submarine's course                                                         |  |                |       |                 |       |
| 5. Height of release of weapon(s)                                                                         |  |                |       |                 |       |
| 6. Ground speed of attack                                                                                 |  |                |       |                 |       |
| 7. Time interval between disappearance of submarine and release of weapon(s)                              |  |                |       |                 |       |
| 8. Position of either point(s) of entry of weapon(s) or explosions relative to submarine or swirl         |  |                |       |                 |       |
| 9. Position of answering submarine smoke candle relative to entry point(s) of weapon(s)                   |  |                |       |                 |       |
| 10. Was a VECTAC conducted with another aircraft or helicopter? If so, give details and estimated results |  |                |       |                 |       |

| CASEX FORM B (Cont'd)                                                                                                                                                        |  |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|-------|-------|-------|
|                                                                                                                                                                              |  | Run 1 | Run 2 | Run 3 | Run 4 |
| h. <u>Weapon(s) Used</u>                                                                                                                                                     |  |       |       |       |       |
| 1. Number and type of weapons used or simulated                                                                                                                              |  |       |       |       |       |
| 2. Was a gunnery attack simulated? If so, with what results?                                                                                                                 |  |       |       |       |       |
| i. <u>Submarine Data</u>                                                                                                                                                     |  |       |       |       |       |
| 1. Type                                                                                                                                                                      |  |       |       |       |       |
| 2. Name or number (if known)                                                                                                                                                 |  |       |       |       |       |
| 3. Details of submarine tactics before, during, and after attack. (Any photographs taken are to be attached to this report)                                                  |  |       |       |       |       |
| j. <u>Aircraft Commander's Assessment of Attack</u>                                                                                                                          |  |       |       |       |       |
| Aircraft commander's assessment of accuracy of attack, and estimation of results.                                                                                            |  |       |       |       |       |
| <div style="text-align: center;">           .....<br/>           Aircraft Commander Signature         </div>                                                                 |  |       |       |       |       |
| <b><del>SECTION VIII--COMMENTS BY COMMANDING OFFICER</del></b>                                                                                                               |  |       |       |       |       |
| The commanding officer's comments are to include an assessment of crew efficiency and of attacks carried out.                                                                |  |       |       |       |       |
| <div style="text-align: center;">           Run    1 .....<br/>                     2 .....<br/>                     3 .....<br/>                     4 .....         </div> |  |       |       |       |       |
| <div style="text-align: center;">           .....<br/>           Commanding Officer Signature         </div>                                                                 |  |       |       |       |       |

CASEX FORM B (Cont'd)

SECTION IX--DIAGRAM OF ATTACK OR PLOT OF UNDERWATER TRACKING

Scale: .....  
Wind Velocity: .....

W  $\begin{array}{c} \text{N} \\ | \\ \text{---} \\ | \\ \text{S} \end{array}$  E Insert true bearing of Sun or Moon

Figure 6.3. CASEX Form C – Submarine Record Form (NU)

| CASEX FORM C--SUBMARINE RECORD FORM                                                              |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------|-----------|--------|-------|------------------------------------------|---------|------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SECTION I--GENERAL INFORMATION                                                                   |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| Name of submarine _____                                                                          |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| CASEX Number or description of the exercise _____                                                |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| Time zone used in report _____                                                                   |           |        |       |                                          |         | Date _____ |       |                                                                                                                                                                                      |
| Weather _____                                                                                    |           |        |       | Sea State _____                          |         |            |       |                                                                                                                                                                                      |
| Visibility _____                                                                                 |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| Geographic position of diving _____                                                              |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| Layer depth (measured from surface to top of layer) _____                                        |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| Temperature drop in layer _____                                                                  |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| SECTION II--NAVIGATIONAL RECORD (FOR USE WHEN CARRYING OUT TORPEDO ATTACKS OR DURING A/S ACTION) |           |        |       |                                          |         |            |       |                                                                                                                                                                                      |
| Time                                                                                             | Submarine |        |       | Target, or A/S ship or Aircraft Estimate |         |            |       | Remarks                                                                                                                                                                              |
|                                                                                                  | Depth     | Course | Speed | Range                                    | Bearing | Course     | Speed |                                                                                                                                                                                      |
|                                                                                                  |           |        |       |                                          |         |            |       | To include signals made or received from Tables 5-2, 5-3, 5-4, 5-5 and 5-6, and use of decoy.<br><br>Own geographic position to be included for initial contact and each A/S action. |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CASEX FORM C (Cont'd)                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| SECTION III--DETAILS OF TORPEDO ATTACK                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Time of first sighting or contact on target _____                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Method _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Range and bearing of first contact on target _____                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Range and bearing of target and nearest screening ship, when penetrating screen _____                                                                                                                                                                                                                                                                                                                                                                                                               |
| Torpedo firing data (to include range and bearing of target at moment of firing, estimation of enemy course and speed, number of torpedoes fired or simulated, and number in salvo aimed to _____)                                                                                                                                                                                                                                                                                                  |
| SECTION IV--GENERAL REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| General remarks are to include:-----                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>a. Short description of torpedo attack</li> <li>b. Effectiveness of screen and air patrols</li> <li>c. Bathythermograph records</li> <li>d. Number of opportunities to fire defensive weapons against A/S ships</li> <li>e. Effectiveness of A/S ships in holding contact</li> <li>f. Effectiveness of aircraft detection and/or attack, with remarks on accuracy of sonobuoy patterns, bombs, or markers, giving range and bearing when observed</li> </ul> |

Figure 6.4. CASEX Form D – Helicopter Anti-Submarine Sortie Report (NU)

|                                                                                                                         |          |                 |                                        |              |          |                    |             |        |              |
|-------------------------------------------------------------------------------------------------------------------------|----------|-----------------|----------------------------------------|--------------|----------|--------------------|-------------|--------|--------------|
| <b>CASEX D*—HELICOPTER ANTI-SUBMARINE SORTIE REPORT</b>                                                                 |          |                 |                                        |              |          |                    |             |        |              |
| CASEX Number or description of the exercise                                                                             |          |                 |                                        | Date         |          |                    |             |        |              |
| <b>SECTION I—AIRCRAFT DETAILS</b>                                                                                       |          |                 |                                        |              |          |                    |             |        |              |
| Base or Parent Ship                                                                                                     | Squadron | Helicopter Type | Helicopter Number, Letter, or Callsign |              | Pilot    | Observer           | Operator    |        |              |
|                                                                                                                         |          |                 |                                        |              |          |                    |             |        |              |
| <b>SECTION II—SORTIE TIMES</b>                                                                                          |          |                 |                                        |              |          |                    |             |        |              |
| Airborne (DTG)                                                                                                          | On Task  |                 |                                        |              | Off Task |                    |             |        | Landed (DTG) |
|                                                                                                                         | Ordered  | Actual          | Punctuality                            | Reason       | Ordered  | Actual             | Punctuality | Reason |              |
|                                                                                                                         |          |                 |                                        |              |          |                    |             |        |              |
| <b>SECTION III—TASK</b>                                                                                                 |          |                 |                                        |              |          |                    |             |        |              |
| To include types of searches or patrols carried out, area covered, and details of any deviations from the ordered task. |          |                 |                                        |              |          |                    |             |        |              |
|                                                                                                                         |          |                 |                                        |              |          |                    |             |        |              |
| <b>SECTION IV—NARRATIVE OF SORTIE</b>                                                                                   |          |                 |                                        |              |          |                    |             |        |              |
| To include all important incidents, sightings of own or enemy forces, and narrative of attack with positions and times. |          |                 |                                        |              |          |                    |             |        |              |
|                                                                                                                         |          |                 |                                        |              |          |                    |             |        |              |
| <b>SECTION V—UNSERVICEABILITY OF EQUIPMENT</b>                                                                          |          |                 |                                        |              |          |                    |             |        |              |
| Helicopter unserviceability sonar equipment, and so forth.                                                              |          |                 |                                        |              |          |                    |             |        |              |
| <b>SECTION VI—SONAR REPORT</b>                                                                                          |          |                 |                                        |              |          |                    |             |        |              |
| Dip Letter                                                                                                              | Time     | Ball Depth      | Bearing                                | Pulse Length | Range    | Range Scale in Use | Echo Pitch  | HE     |              |
|                                                                                                                         |          |                 |                                        |              |          |                    |             |        |              |
| * This form is intended for peace and wartime exercises.                                                                |          |                 |                                        |              |          |                    |             |        |              |



## GLOSSARY

**NOTE:** Definitions or portions thereof that appear in APP-06 as NATO agreed terminology, or in ACP-167, are indicated by underlining.

**Air Bubble.** A bubble of air discharged from a submerged submarine. It is used by a submarine to indicate its position to surface and air units. It is sometimes termed a 'water slug'.

**Aircraft.** The collective term for fixed-wing aircraft and helicopters.

**Area of Probability (AOP).** A defined area in which the presence of one or more submarines or surface vessels is suspected.

**ASW Action.** An exercise ASW action is an operation by one or more ASW units against a particular submarine. In order to permit the necessary maneuvers for ASW action to be safely executed, safety precautions to be taken by the submarine(s) and ASW units may be in addition to the safety precautions required in the exercise as a whole. In exercises, ASW action begins with COMEX and ends with FINEX or Stop Time, whichever is earlier. If it is desired to continue the ASW action after FINEX, then a new COMEX must be ordered, providing that this is allowed by the exercise orders (see Article 5.14.5).

**AUTT(s).** Autonomous Underwater Training Target.

**Base Course.** A reference course or direction desired to be made good when evasive steering is being carried out.

**Base Speed.** The speed resulting along the base course when evasive steering is being carried out.

**CASEX.** Standard ASW exercises.

**Cavitation.** The formation of local cavities (bubbles) in a liquid as a result of the reduction of total pressure. This pressure reduction may result from a negative pressure produced by rarefaction or from the reduction of pressure by hydrodynamic flow such as is produced by highspeed movement of an underwater propeller.

**Close ASW Action.** An action in which one or more ASW units attempt to engage an enemy submarine within 8,000 yards.

**COMEX.** COMEX is the time of starting an ASW action. It is normally a warning to the submarine of attacks by ASW units.

**Critical-Angle Towed Array System (CATAS).** A towed array system whose depth is dependent upon towing ship speed and the length and width of the towing cable only.

**DATUM.** The last known position of a submarine or suspected submarine after contact has been lost.

**DATUM TIME.** The time when contact with the submarine or suspected submarine was lost.

**Daylight.** Daylight is defined as extending from sunrise to sunset.

**Decoy.** An acoustic warfare electronic, chemical, or mechanical device designed to mislead sonar operators or the target-seeking device in homing torpedoes.

**Depressed Towed Array System (DTAS).** A towed array system which is taken to desired depth by a towed body or depressor.

**Dive.** The order to a submarine to proceed from the surface to periscope depth or deeper.

**Diversion.** A change made in a prescribed route for operational or tactical reasons. Except in the case of aircraft, a diversion order will not constitute a change of destination.

**Diving Message.** A message sent by a submarine before diving for a training exercise, to indicate the expected time and duration of the dive.

**Duration.** Duration is the specified time period for an ASW action. It must be given in minutes in the exercise orders. When Relaxation 2\*M is in force, duration is not required.

**Duration of ASW Action.** In exercises, the duration between COMEX and FINEX as laid down in the orders for the exercise.

**Electronic Countermeasures (ECM).** That division of EW involving actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum.

**Electronic Warfare Support Measures (ESM).** That division of EW involving actions taken to search for, intercept, locate, record and analyze radiated electromagnetic energy for the purpose of exploiting such radiations in support of military operations. Thus, ESM provides a source of EW information required to conduct electronic countermeasures (ECM), electronic protection measures (EPM), threat detection, warning, avoidance, target acquisition, and homing.

**FINEX.** In exercises and when a duration has been established, it is the time of ending of an ASW Action. It is equal to COMEX plus the duration of ASW action ordered.

**Flare/Grenade.** For ASW exercise purposes, a flare/grenade is a pyrotechnic light used for signaling or identification.

**Friendly Forces (FRNFOR).** Those forces used in a friendly role during NATO exercises.

**Go Time.** The start of an ASW exercise period. After this time, dived submarines may be encountered and full safety precautions must be observed until Stop Time.

**Heavy Projectiles.** Practice projectiles which may only be fired when submarines are at a safe depth.

**Homing.** The technique whereby a mobile station directs itself, or is directed, towards a source of primary or reflected energy, or to specified point.

**Homing Torpedo.** An anti-submarine or anti-ship torpedo which steers towards its target using active or passive target-seeking detection equipment to determine its course.

**Hydrophone Effect (HE).** Underwater sounds which emanate from ships, submarines or torpedoes and which are detectable by listening devices.

**Impact Target.** A target submarine against which an Impact Weapon is to be fired or dropped, whether or not the weapon is set to hit.

**Impact Weapon.** A practice ASW weapon for use against an Impact Target submarine which might strike the submarine, whether or not the weapon is set to hit.

**Light Projectiles.** Practice ASW projectiles for which no special precautions are necessary when fired at dived submarines.

**Localization.** The determination of a contact's position by reducing the general area of contact to a more definite and smaller area.

**MADVEC.** A procedure in which aircraft are vectored by informative or radar methods to carry out MAD verification of a contact to assist in classification.

**Magnetic Anomaly Detector (MAD).** A passive or active/passive device which detects the presence of a magnetic material by the distortions such material produces in the natural magnetic field of the earth.

**Maritime Headquarters (MHQ).** The joint headquarters ashore from which Allied shipping, aircraft, and submarine operations are controlled and coordinated. (Also called Sea-Air Headquarters.)

## Marked Submarine

- (1) In elementary exercises a submarine may be marked by towing a marker (such as a small buoy, float with flag, or three elliptical floats) by day or by burning the appropriate lights while submerged by night.
- (2) In SUB vs SUB exercises, a 'marked' submarine is a submarine which proceeds at one metre (three feet) less than the optimum periscope depth for the prevailing conditions and, at the same time, shows all masts and periscopes fully extended.

**MTAS.** Multiple Towed Array System.

**Maximum Permissible Operating Depth.** This depth is an absolute depth for an individual submarine below which that submarine must not deliberately proceed.

**Me-You Message.** A message used in ASW exercises to enable a quick exchange of target ship's estimated and true course and speed. (Also called Claim Message.)

**Night.** Night is defined as extending from sunset to sunrise, the times of sunset and sunrise being obtained from the Nautical Almanac. These times are to be calculated from the position of the ASW action.

**On-Top Position.** The position indicated by an aircraft when over the submarine, datum, or some reference point from which the position of the submarine or datum may be given as a bearing and distance.

**Opposing Forces (OPFOR).** Those forces used in an enemy role during NATO exercises.

**Out of Action.** A condition imposed by umpires during exercises, in which combatant units as well as shore establishments are declared neutralized in whole or in part.

**Patrol.** A detachment of units sent out for the purpose of gathering information or the systematic and continuing investigation along a line to detect or hamper enemy movements.

**Periscope Depth (PD).** The maximum depth at which a submarine can use its periscopes when they are fully extended.

**Relaxation.** A modification of safety precautions and operating restrictions in order to make the training more realistic.

**Rescue Coordination Centre (RCC).** A centre established within a designated search and rescue area to permit efficient organization of search and rescue.

**Responsible Submarine.** In submarine ASW exercises, the responsible submarine is the submarine which is responsible for taking action to avoid a submerged collision.

**Restricted Submarine.** A submarine is said to be restricted during an ASW exercise if it has been given specific instructions regarding its course, speed, or depth.

**Safe Bottoming Areas.** Specially selected areas established by area commanders in which it is considered that submarines may bottom without risk of damage from rocks, mines and wrecks.

**Safe Depth.** A submarine is said to be at Safe Depth when its keel depth is such as to provide the required separation between the top of the fixed structure of the submarine and the lowest point of any ship, other submarine assigned to a higher layer, towed ASW device and/or helicopter sonar systems allowed in the orders for the exercise. When more than one towed device is being used in the exercise, Safe Depth applies to the deepest device being employed.

**Safety Bearing.** The safety bearing is the bearing of the target submarine from the attacking submarines at the commencement of a run.

**Safety Circle.** A safety circle is a circle drawn with its centre being the position of an attacking submarine at the start of a run. Two concentric safety circles are drawn as the plot of the attacking and target submarines, called inner and outer safety circles. Unless otherwise stated in the message ordering the exercise, the radius of the inner safety circle is to be 3000 yards and radius of the outer safety circle is to be 5000 yards. These radii may be altered at the discretion of the SUBOPAUTH, but the radius of the inner safety circle is never to be less than 3000 yards, and the difference in radii should NEVER be less than 2000 yards.

**Safety Course.** A pre-arranged course included in the detailed orders for the exercise. It must be one of the cardinal points of the compass, and it is always signaled as "NORTH", "SOUTH", "EAST" or "WEST". It is the course to be steered when a submarine is coming to PD using surfacing procedures or in an emergency.

**Safety Lane.** A specified sea lane designated for use in transit by submarines and surface ships in order to prevent attack by friendly forces.

**Safety Line.** A line drawn at right angles to the safety bearing at a distance specified in the exercise orders/messages but never less than 2000 yards from the initial position of the attacking submarine in the direction of the target.

**Scene of Action Commander (SAC).** The officer who assumes tactical control of the assigned units in a limited area, operating against a specific contact or datum.

**Search Attack Unit (SAU).** The designation given to a unit separately organized or detached from a formation to search for and attack submarines.

**Smoke Signal.** A pyrotechnic which is used in signaling or identification, and which provides a coloured smoke.

**Snorkel (Snort).** An extensible breather pipe which enables a submarine to operate diesel engines while remaining submerged.

**Sonar.** An acoustic device used primarily for the detection and location of underwater objects.

**Sonar Signaling Transmission (SST).** The process of transmitting and receiving Morse signals by sonar equipment.

**Special and/or Exercise Instructions.** A modification of standard exercises and procedures in order to improve training value.

**Starred Relaxation.** A relaxation which may be used subject to prior approval of the SUBOPAETH.

**Stop Time.** The end of an ASW exercise period.

**SUBLOOK.** Code word of the procedures initiated by an authority when the safety of a submarine is in doubt or by a SUBOPAETH when a Surfacing Signal, Arrival Report or SUBCHECK Report from a submarine under his operational control becomes one hour overdue.

**Submarine Depth.** The depth of a submarine is measured from the surface to the keel depth.

**Submarine Evasive Devices or Decoys.** Devices used by a submarine to confuse sonar operators or homing torpedoes by masking the submarine's self-noises, by creating false echoes, or masking echo-ranging signals.

**Submarine Operating Authority (SUBOPAETH).** The naval commander exercising operational control of submarines.

**Submarine Safety Separations.** Vertical separations which, for safety during exercises, restrict operating depths. These Vertical Safety Separations are not adequate for major casualties, but can be used for planning purposes when inadvertent loss of depth control is the only consideration.

**Submarine Towed Array System (STAS).** A towed array system where a neutrally buoyant array is deployed directly astern of the submarine and at the same depth.

**Submerged.** A submarine is submerged when it is at periscope depth or deeper.

**SUBMISS.** Code word of the signal originated by the SUBOPAUTH when a Surfacing Signal, SUBCHECK Report or Arrival Report of a submarine is 6 hours overdue, or, for a one compartment submarine, 3 hours overdue.

**SUBSUNK.** Code word of the signal originated by any authority who has positive information that a submarine has sunk.

**Surface.** The order to a submarine to proceed from periscope depth to the surface.

**Surfacing Procedure.** The method used by a submarine, ship or helicopter to bring a submarine from Safe Depth to Periscope Depth (PD).

**Surfacing Signal.** A signal transmitted by a submarine to indicate to the SUBOPAUTH that the period covered by a Diving Signal has been completed.

**Surveillance Towed Array System (SURTAS).** The term SURTAS is used to describe towed array systems which are used in ASW area operations. They are optimized for passive acoustic detection of submarine-radiated noise while operating at low tow speed, and normally use a very long array.

**Tactical Sonar Range (TSR).** Is a range based on reported Predicted Sonar Range and may make allowances for probable submarine depth, alertness of operators, level of unit efficiency, and so forth.

**Tactical Towed Array System (TACTAS).** The term TACTAS is used to describe towed array systems which are primarily designed for use in ASW direct support operations. Their passive acoustic performance is optimized for submarine detection at higher tow speeds.

**Time.** Zone time to be used throughout the exercises (GMT is to be used whenever possible to avoid confusion).

**Time Late at Datum.** The lapsed time between datum time and the arrival of units at the datum.

**Too Close.** Throughout submarine ASW exercises, if the attacking and target submarines are at periscope depth they are to be understood as being too close to one another when the range is less than 1500 yards and the distance off track is less than 800 yards.

**Torpedo Countermeasures (TCM).** The material and tactical measures that are adopted by ships for protection against submarine torpedoes.

**Torpedo Danger Area (TDA).** The area extending beyond the furthest-on circle for an arbitrarily assessed distance of 8,000 yards.

**Torpedo Danger Zone (TDZ).** An area which the submarine must enter in order to be within maximum effective torpedo firing range.

**Towed Array System (TAS).** An acoustic system which uses a line of hydrophones located in an array towed by surface ships and submarines. The system is capable of lone range detection of submarine radiated noise and may give indications of bearing.

**Transit Lane.** A transit lane is a lane between transit positions in which the target submarine has complete freedom of action except when restricted for depth. The width of the lane is to be laid down in the orders for the exercise and will depend on the extent to which it is desired to restrict the target submarine, and geographic limitations.

**Transit Positions.** Positions specified in the exercise orders/message, which provide the center line of a transit lane.

**Turn Count Masking.** The term used to signify the creation of a revolution difference between ship's propeller shafts.

**Underwater Telephone (UWT).** A means of voice communication in which the water of the sea is used as a transmission medium.

**Unit.** A ship, aircraft or submarine, or a small group of ships and/or aircraft acting as an entity.

**Units of Measurement.** NATO publications are in the process of being amended to the following standard units of measurement:

range - yards,

distance - nautical miles,

altitude - feet, and

depth of objects and water depth - meters.

**Unrestricted Submarine.** A submarine is unrestricted during an ASW exercise if no instructions are given as to course, speed or depth.

**Variable Depth Sonar (VDS).** The term is normally used to describe a sonar whose transducer is towed beneath the parent ship with the object of improving sonar detection ranges. Helicopter and submarine sonars, though variable in depth, are not usually included.

**Vectored Attack (VECTAC).** Attack in which a weapon carrier (air, surface or sub-surface) not holding contact on the target, is vectored to the weapon delivery point by a unit (air, surface or sub-surface) which holds contact on the target.

**Zero Time.** The exact hour immediately preceding the time of execution of a tactical action or manoeuvre from which time measurement is recorded and reported in minutes. (If the time of execution is exactly on the hour, that time will be Zero Time.)

**ZIGZAG.** Straight line variations from the base course performed in accordance with a set plan.

**(NU)(NMM) NOTE:** NOT RELEASABLE

## INDEX

### A

|                                       |              |
|---------------------------------------|--------------|
| Acoustic Equipment Requirements ..... | 2-25         |
| Aircraft Emergencies .....            | 2-11         |
| Aircraft Distress Signals .....       | 5-20 to 5-24 |
| Aircraft Maneuver Signals .....       | 5-19         |
| Analysis .....                        | 6-1          |
| Attack .....                          | 6-1          |
| Data Forms .....                      | 6-5          |
| Exercise .....                        | 1-2          |
| Tactical .....                        | 6-3          |
| Attack Assessment .....               | 6-1          |
| Attack Claims by Submarines .....     | 6-3          |
| Attack Restrictions .....             | 2-55         |
| Attack Signals .....                  | 5-3, 5-4     |
| Attacks                               |              |
| Marking Attacks .....                 | 4-8          |
| Authorization Tables                  |              |
| Explosive SUS .....                   | 2-45         |
| VDS/Towed Array .....                 | 2-32         |

### B

|                          |     |
|--------------------------|-----|
| Brevity Code Table ..... | 6-7 |
|--------------------------|-----|

### C

|                                     |           |
|-------------------------------------|-----------|
| CASEX                               |           |
| Instruction Table .....             | 3-17      |
| Order Table .....                   | 3-4       |
| Relaxation Table .....              | 3-8       |
| CASEX A Series .....                | 3-41      |
| CASEX B Series .....                | 3-42      |
| CASEX C Series .....                | 3-42      |
| CASEX E Series .....                | 3-43      |
| CASEX F Series .....                | 3-43      |
| CASEX Instructions .....            | 3-5       |
| CASEX S Series .....                | 4-11      |
| Changing Depth Safety Signals ..... | 4-9       |
| Check Report .....                  | 5-5       |
| Collision Avoidance .....           | 4-4       |
| Communication Methods .....         | 5-1       |
| Communications .....                | 2-27, 5-1 |
| Confined Waters .....               | 2-65      |
| Coordinated Operations .....        | 4-9       |

## D

|                                           |              |
|-------------------------------------------|--------------|
| Data Forms.....                           | 6-5          |
| Definitions.....                          | 1-3          |
| Depth Changes                             |              |
| Through Zones Assigned to Other Subs..... | 4-6          |
| Depth Limitation Chart.....               | 2-19         |
| Depth Restrictions                        |              |
| Decoy.....                                | 2-22         |
| Distress Signals                          |              |
| Aircraft/Surface.....                     | 5-20 to 5-24 |
| Diving Message.....                       | 5-5          |
| Diving Procedures.....                    | 2-58         |

## E

|                                          |              |
|------------------------------------------|--------------|
| Electronic Sound Underwater Signals..... | 2-47         |
| Emergencies                              |              |
| Aircraft.....                            | 2-11         |
| Aircraft Distress Signals.....           | 5-20 to 5-24 |
| During Exercise.....                     | 2-10         |
| Emergency Surfacing.....                 | 2-12         |
| Submarine.....                           | 2-12         |
| ESUS.....                                | 2-47         |
| ESUS MK 84.....                          | 5-17         |
| Exercise                                 |              |
| Analysis.....                            | 1-2          |
| Command and Control.....                 | 1-2          |
| Confined Waters.....                     | 2-65         |
| Instruction Table.....                   | 3-2          |
| Instructions.....                        | 3-2          |
| Ordering.....                            | 3-1          |
| Records.....                             | 6-1          |
| Report Data Forms.....                   | 6-5          |
| Restrictions.....                        | 2-55         |
| Standard.....                            | 3-1          |
| Stovepipes.....                          | 2-45         |
| Explosive Charge Signals.....            | 5-1, 5-8     |
| Explosive Charges.....                   | 2-45         |
| Explosive SUS Table.....                 | 2-48         |

## F

|                               |      |
|-------------------------------|------|
| Fishing Vessel Avoidance..... | 2-4  |
| FORMEX                        |      |
| CASEX A.....                  | 6-8  |
| CASEX B.....                  | 6-10 |
| CASEX C.....                  | 6-17 |

## G

|               |     |
|---------------|-----|
| Gridlock..... | 4-6 |
|---------------|-----|

## H

|                          |      |
|--------------------------|------|
| Helicopter Sonar         |      |
| Safety Precautions ..... | 2-17 |
| HOOKER Procedure.....    | 2-7  |

## I

|                           |              |
|---------------------------|--------------|
| Impact Restrictions ..... | 2-48 to 2-54 |
|---------------------------|--------------|

## L

|               |      |
|---------------|------|
| Lookouts..... | 2-26 |
|---------------|------|

## M

|                              |      |
|------------------------------|------|
| MARK - SNAP Ranging .....    | 5-25 |
| Marked Submarine .....       | 4-2  |
| Marking Attacks .....        | 4-8  |
| Method ALFA Surfacing.....   | 2-59 |
| Method BRAVO Surfacing ..... | 2-63 |

## N

|                        |      |
|------------------------|------|
| Neutral Corridor ..... | 2-39 |
| Night Exercises.....   | 2-58 |

## O

|                              |     |
|------------------------------|-----|
| Operating Restrictions ..... | 2-1 |
|------------------------------|-----|

## P

|                              |      |
|------------------------------|------|
| Participating Submarines     |      |
| Minimum Requirements.....    | 4-1  |
| Procedures                   |      |
| HOOKER.....                  | 2-7  |
| Surfacing .....              | 2-56 |
| Unidentified Submarine ..... | 2-59 |
| Pyrotechnic Signals .....    | 5-2  |
| Pyrotechnics Table .....     | 5-7  |

## R

|                            |      |
|----------------------------|------|
| Range                      |      |
| MARK - SNAP Method .....   | 5-25 |
| Records .....              | 4-1  |
| Records and Analysis ..... | 6-1  |
| Relaxation Table.....      | 3-8  |

|                                    |      |
|------------------------------------|------|
| Relaxations .....                  | 3-8  |
| Restrictions .....                 | 1-4  |
| Restrictions .....                 |      |
| Decoy Depth .....                  | 2-22 |
| Safe Depth .....                   | 2-23 |
| Restrictions .....                 | 1-4  |
| Night ASW Exercises .....          | 2-58 |
| Submarines as Impact Targets ..... | 2-55 |

## S

|                                          |              |
|------------------------------------------|--------------|
| Safety .....                             | 2-1          |
| Changing Depth Signals .....             | 4-9          |
| Helicopter Sonars .....                  | 2-9          |
| Lookouts .....                           | 2-26         |
| Responsibilities .....                   | 2-2          |
| Safety Bearing .....                     | 4-2          |
| Safety Circle .....                      | 4-4, 4-5     |
| Safety Line .....                        | 4-3          |
| Towed Decoys .....                       | 2-29         |
| VDS/Towed Array Safety Precautions ..... | 2-14         |
| Safety Precautions .....                 | 2-14         |
| Safety Rules .....                       | 4-3          |
| Safety Separation .....                  | 2-13         |
| Safety Zone .....                        | 4-3          |
| Security .....                           | 1-1          |
| Shallow Water Exercises .....            | 2-17         |
| Ship Noise .....                         | 2-26         |
| Signal .....                             |              |
| Sonar Codes .....                        | 5-14 to 5-16 |
| Signals .....                            | 2-26         |
| Aircraft Distress .....                  | 5-20 to 5-24 |
| Aircraft Manoeuvre .....                 | 5-19         |
| Brevity Codes .....                      | 6-7          |
| Changing Depth Safety Signals .....      | 4-9          |
| Diving/Surfacing/Check Reports .....     | 5-4          |
| Electronic SUS .....                     | 2-47         |
| ESUS .....                               | 5-17         |
| Explosive Charge Signals .....           | 5-1, 5-8     |
| Pyrotechnic Signals .....                | 5-2          |
| Safety and Control .....                 | 5-2          |
| Sonar Signal Codes .....                 | 5-2          |
| Special .....                            | 5-3          |
| SST/UWT Signals .....                    | 5-11 to 5-13 |
| Submarine Attack Signals .....           | 5-4          |
| Submarine Pyrotechnics .....             | 5-11 to 5-13 |
| Submarine Track Message .....            | 6-4          |
| SUS .....                                | 5-7 to 5-10  |
| Target Data Message .....                | 6-5          |
| Target Data Message Codes .....          | 6-7, 6-8     |

|                                       |           |
|---------------------------------------|-----------|
| Torpedo Attack .....                  | 5-3, 5-18 |
| Underwater Telephone (UWT) .....      | 4-7       |
| SITUATION Report .....                | 2-64      |
| Skylights/Stovepipes .....            | 2-44      |
| Sonar Signal Code Table .....         | 5-2, 5-14 |
| Sonar Signal Codes .....              | 5-2       |
| Special Signals .....                 | 5-4       |
| Specifications                        |           |
| Towed Array .....                     | 2-35      |
| VDS .....                             | 2-34      |
| Standard Exercises .....              | 3-1       |
| Stop Time .....                       | 2-64      |
| Stovepipes/Skylights .....            | 2-44      |
| Submarine Track Message .....         | 6-4       |
| Submarine(s)                          |           |
| Acoustic Equipment Requirements ..... | 2-25      |
| Attack Claims .....                   | 6-3       |
| Collision Avoidance .....             | 4-4       |
| Coordinated Operations .....          | 4-10      |
| Course and Speed Diagrams .....       | 3-29      |
| Depth Limitation Chart .....          | 2-19      |
| Diving Procedures .....               | 2-58      |
| Emergencies .....                     | 2-11      |
| Fishing Vessel Avoidance .....        | 2-4       |
| Identification .....                  | 5-5       |
| Pyrotechnics Table .....              | 5-7       |
| Pyrotechnic Signals .....             | 5-2       |
| Safety and Control Signals .....      | 5-2       |
| Surfacing in an Emergency .....       | 2-13      |
| Surfacing Procedures .....            | 2-59      |
| Track Message .....                   | 6-4       |
| Surfacing                             |           |
| Method ALFA .....                     | 2-59      |
| Method BRAVO .....                    | 2-60      |
| Procedures .....                      | 2-59      |
| Surfacing Messages .....              | 5-5       |
| SUS .....                             | 2-47      |

## T

|                                  |           |
|----------------------------------|-----------|
| Tactical Analysis .....          | 6-2       |
| Target Data Message .....        | 6-5       |
| Target Data Message Codes .....  | 6-7, 6-8  |
| Torpedo Attack Signals .....     | 5-3, 5-18 |
| Torpedo Firing .....             | 4-9       |
| Towed Array Specifications ..... | 2-35      |
| Towed Decoys                     |           |
| Safety Precautions .....         | 2-22      |
| Training .....                   | 1-1       |

|                        |          |
|------------------------|----------|
| Transit Lane.....      | 4-3, 4-5 |
| Transit Position ..... | 4-3      |

U

|                                  |              |
|----------------------------------|--------------|
| Underwater Signal Codes          |              |
| ESUS .....                       | 5-17         |
| Explosive Charge Signals.....    | 5-1, 5-8     |
| SONAR .....                      | 5-2          |
| SST/UWT Signals.....             | 5-11 to 5-13 |
| SUS.....                         | 5-7 to 5-10  |
| Underwater Telephone (UWT) ..... | 2-25         |

V

|                               |      |
|-------------------------------|------|
| VDS Specifications .....      | 2-34 |
| VDS/Towed Array               |      |
| Authorization Table.....      | 2-32 |
| Safety Precautions .....      | 2-14 |
| Visibility Requirements ..... | 2-25 |

**LIST OF EFFECTIVE PAGES**

| <b>PAGE NUMBER</b>       |
|--------------------------|
| I to XV (RB)             |
| 1-1 to 1-5 (RB)          |
| 2-1 to 2-65 (RB)         |
| 3-1 to 3-167 (RB)        |
| 4-1 to 4-38              |
| 5-1 to 5-23 (RB)         |
| 6-1 to 6-20              |
| Glossary-1 to Glossary-8 |
| Index-1 to Index-6       |
| LEP-1 (RB)               |

Reserve Blank – (RB)

**INTENTIONALLY BLANK**



**NATO UNCLASSIFIED**

**MXP-01**

**EDITION E VERSION 7**

**NATO UNCLASSIFIED**