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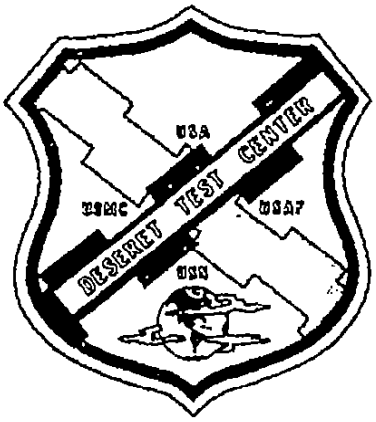

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AUTUMN GOLD (U)

TEST 63-2

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FINAL REPORT MAY 1964

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DTC 64-535

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N 1965

CANCELLED [redacted]

DTC-TEST-63-3-FR

AD 345779 [redacted]74

Deseret Test Center Final Report
TEST 63-2

A U T U M N G O L D (U)

Prepared by

HEADQUARTERS
DESERET TEST CENTER
Fort Douglas, Utah

82 Pages

Classification of Pages

Secret
Pages i through iv,
1 through 30, A-5 through
A-8, B-1 through B-12, C-1
through C-12, F-5 and F-6

Unclassified
Pages v through x, A-1
through A-4, D-1, D-2,
E-1, E-2, F-1 through F-4

[redacted] Laboratories

CANCELLED [redacted]
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F O R E W O R D

1. (S) Deseret Test Center test 63-2, AUTUMN GOLD (U), was conducted in the vicinity of the Hawaiian Islands during the period 3 May 1963 to 31 May 1963. The purpose of the test was to determine the degree of penetration of representative fleet ships, operating under three different material readiness conditions, by a simulant biological aerosol released from an operational weapon system.

2. (S) Authority for conducting the test is contained in:

   . Letter, Chief of Naval Operations to Commanding General Deseret Test Center -- Subject: Chemical-Biological Extracontinental Test Program, Navy Support for (S), dated 10 July 1962, SECRET

   . Document, Deseret Test Center Outline Plans for Testing in FY 1963, Deseret Test Center (U), Fort Douglas 13, Utah, dated 25 May 1962, SECRET

3. (S) The test was designed by the Deseret Test Center, Fort Douglas, Utah. Various units from the Army, Navy, and Marines contributed support to the test program.

4. (S) Acknowledgement is made of the technical contribution of the U. S. Navy Department, Bureau of Ships, Final Report, Operation TRANSIT III. This document provided the basic concepts on which the AUTUMN GOLD (U) test was based.

9 NOV 1973
Date Inventoried

Mary B. Hooper MARY B. HOOPER
Custodian (Signature & Printed Name)

M Roquist
Disinterested Witness (Signature & Printed Name)

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UNCLASSIFIED [redacted]

SECTION I

INTRODUCTION

1. [redacted]

[redacted]

2. [redacted] SCOPE

a. Test Program DTCTP 63-2, AUTUMN GOLD (U), was conducted in three phases, consisting of three trials each, or nine trials total. [redacted]

[redacted]

[redacted]

b. In each trial, two A4B jet aircraft, each equipped with two modified Aero 14B spray tanks, [redacted] disseminated tracer BG (Bacillus globigii) along a release line [redacted]

c. [redacted] The Navy Mark IV and the Army M17 protective masks were tested to determine mask leakage.

[redacted]

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SECTION II

ACCOMPLISHMENT OF TEST OBJECTIVES

1. (U) INTRODUCTION

This section restates the test objectives as originally presented in the AUTUMN GOLD (U) Test Plan, dated 5 April 1963, and indicates the degree to which each objective was accomplished

2. (S) OBJECTIVES

1) *"To obtain information on the degree of penetration of naval ships by simulant biological aerosols when released from an operational type weapon system while the ships are operating under different readiness conditions."*

a. This objective was accomplished. Data are reported and discussed on pages 18 to 23. Conclusions are presented on page 29.

2) *"To estimate the magnitude and persistency of simulant biological aerosols retained after conducting air wash and hose down procedures."*

b. This objective was accomplished. Data are reported and discussed on pages 24 to 25. Conclusions are presented on page 29.

3) *"To provide information on the performance of the Partichrome Selection Device and its components under the environmental conditions of this test."*

c. This objective was accomplished. The results associated with this objective are not included in this report. Douglas Aircraft Company, under contract to Fort Detrick, has analyzed the data and submitted a report on 24 July 1963. Their report number is SM 44553. This final report contains no further information on this objective.

4) *"To evaluate selected biological and chemical protective equipment."*

d This objective was accomplished within the limits of skill of participating personnel in fitting the M-17 and MV masks. Data and discussion are presented on pages 25, D1, and D2.

d This objective was accomplished within the limits of skill of participating personnel in fitting the M-17 and MV masks. Data

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[redacted]

SECTION III

TEST PROCEDURES

1. [redacted] SITE

All trials of AUTUMN GOLD (U) were conducted in an open sea area approximately 60 miles west-southwest of the island of Oahu in the Hawaiian Islands. [redacted] The land base operations were located at Pearl Harbor and the Marine Air Station, Kaneohe, Hawaii.

2. [redacted] BIOLOGICAL TRACER

In all trials an aerosolized slurry of Bacillus globigii (BG) was disseminated. [redacted]

3. [redacted] WEAPON SYSTEM

a. The weapon system, consisting of an Aero 14B spray tank mounted on a A4B jet aircraft, was employed (see Figure 2) in all trials of AUTUMN GOLD (U) to simulate an actual biological attack on a ship or fleet of ships. [redacted]

4. [redacted] TARGET SHIPS

a. The four target ships listed below were assigned by the U. S. Navy as typical operational fleet ships. These ships are shown in Figures 4 through 7

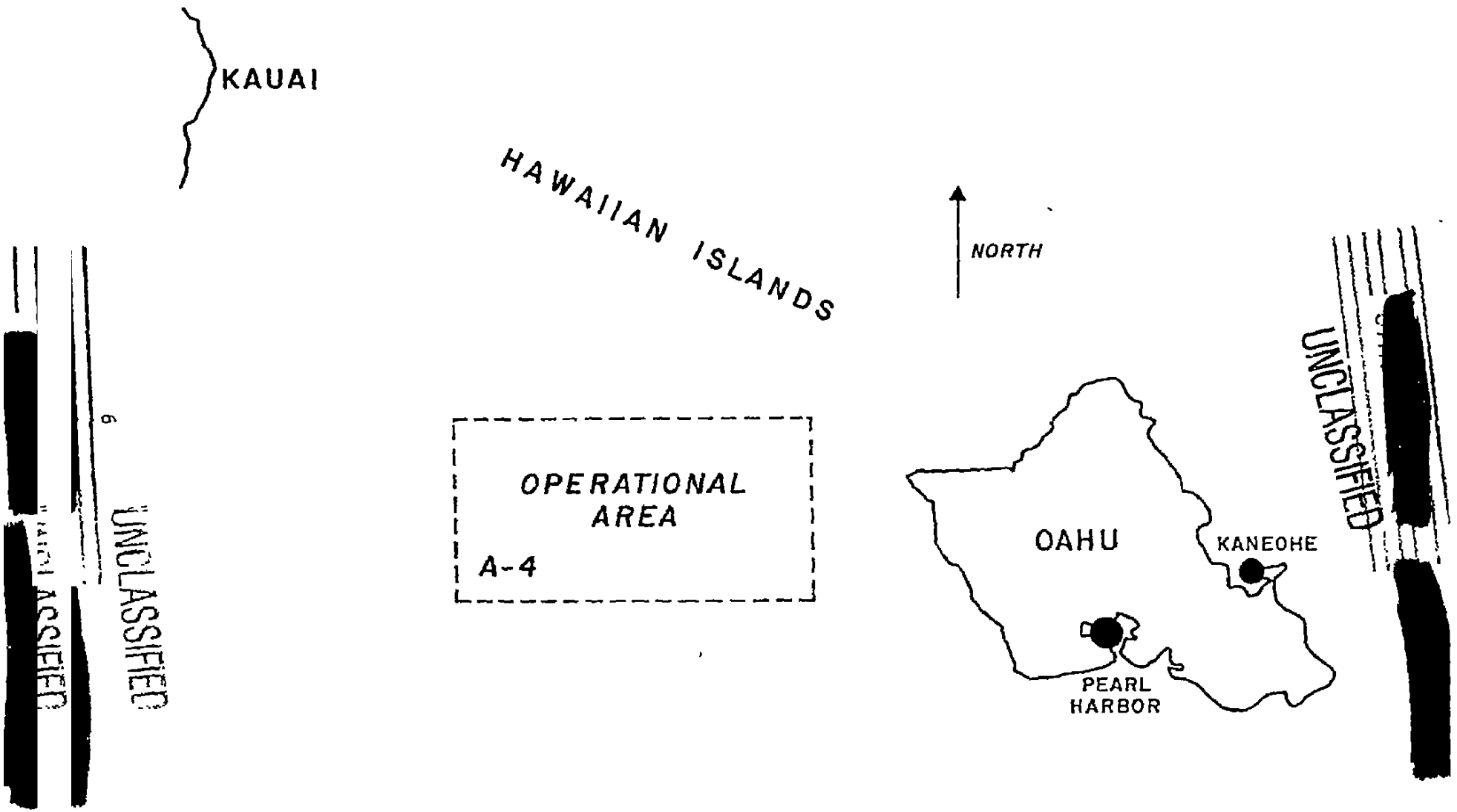


FIGURE 1 (U): Test Area For AUTUMN GOLD (U)

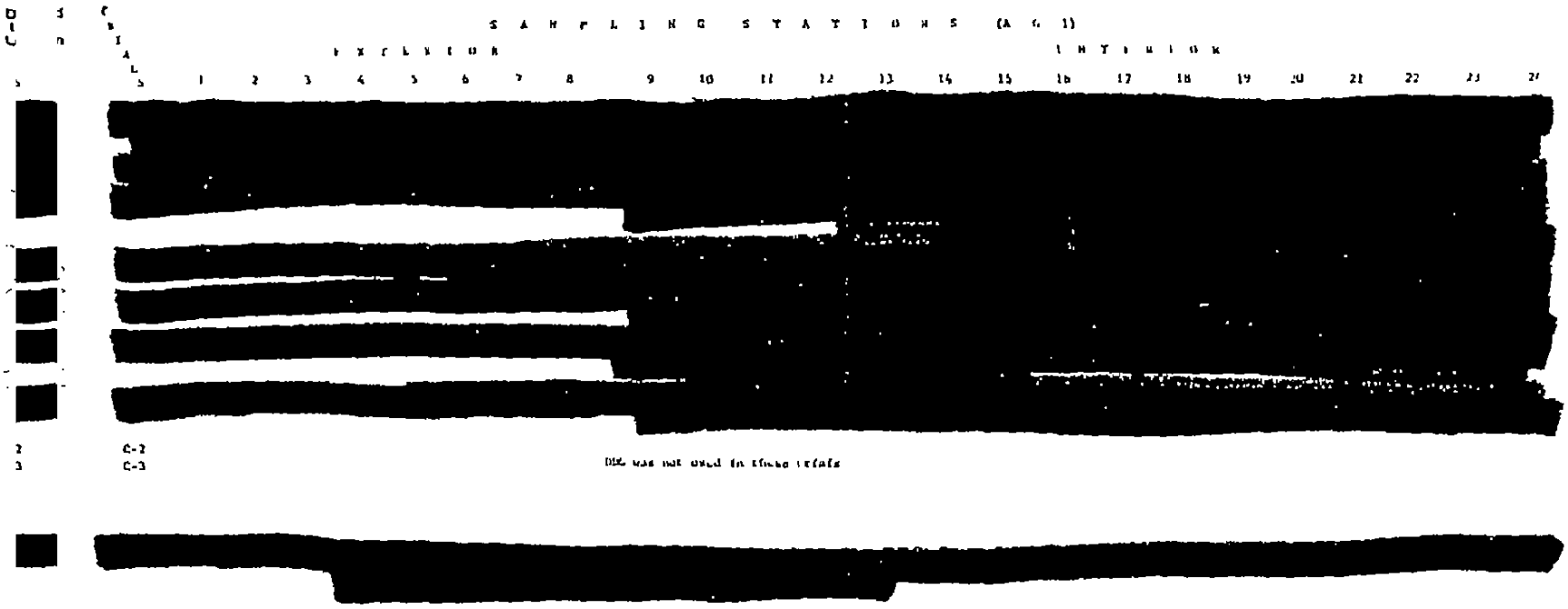
[redacted]

Type	Number	Name
APA	215	USS Navarro
LST	1158	USS Tioga County
DD	825	USS Carpenter
DDG	13	USS Hoel

b. Personnel on each ship were briefed on procedures for pretrial exercises and the need was stressed for attaining the three material readiness conditions during the pretrial training exercises and subsequent trials. Ship personnel conducted these exercises and inspections prior to the AUTUMN GOLD (U) trials to determine each ship's capability to fully attain these readiness conditions under its present condition. [redacted] Navy personnel from each ship were assigned to operate the various sampling equipment on the ship. These men were trained during the week prior to the first trial.

5. [redacted]

DDG 13 USS HOEL



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DESERET TEST CENTER

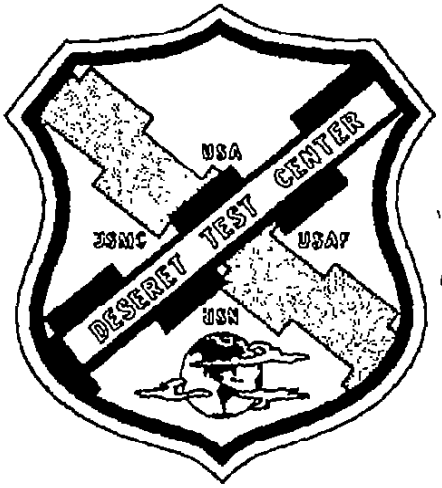
TEST PLAN 63-2

REVISION 1

APRIL 1963

AUTUMN GOLD (U)

REVISION 1



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[redacted]

VI. [redacted] OBJECTIVES

[redacted]

E. To train personnel in operational procedures in preparation for future trials

[redacted]

VII. [redacted]

[redacted]

[redacted]

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[redacted]

APPENDIX H

DEFENSIVE TESTS
(Secret)

PART I

I. (U) TITLE

Protective Masks M17 and Mark V.

II. [redacted] OBJECTIVES

The objectives of this test are as follows:

A. To obtain data on the leakage of the M17 and Mark V protective masks under operational conditions

B. To obtain data on the two methods of determining mask leakage.

III. [redacted] PROCEDURES

In each trial of AUTUMN GOLD, 32 test subjects (eight per ship, four at each of two stations per ship) will be positioned at two above deck sampling sites. Sixteen test subjects will don the M17 protective mask and 16 subjects will don the Mark V protective mask at function time and continue wearing the masks until Z+35 minutes. The schedule for test subjects at each station and the types of protective masks for each test subject is given in Table H 1

TABLE H-1 [redacted]) TEST SUBJECTS AND TYPE OF PROTECTIVE MASKS AT EACH OF TWO STATIONS ON EACH SHIP FOR DTCTP 63-2 (C)

NUMBER OF TEST SUBJECTS	TYPE OF MASK		
	M 17	MARK V	ORONASAL
1 - - - -	X		
1 - - - -	X		X
1 - - - -		X	
1 - - - -		X	X

All test subjects not wearing the oronasal mask and all test subject controls will provide a gargle sample prior to function time and again immediately after Z+35 minutes. All gargle samples and the oronasal masks will be assayed on the laboratory ship YAG 40. Leakage of the protective masks will be determined by analysis of the data.

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[redacted]

JCP-4, DPG

APPENDIX I

PERSONNEL REQUIREMENTS
(Confidential)

The type and number of personnel required to conduct this test are listed in Table I-1

TABLE I-1 (C): TYPE AND NUMBER OF PERSONNEL REQUIRED FOR DTC TP 63-2 (U)

SOURCE OF PERSONNEL					NUMBER REQUIRED		POSITION DESCRIPTION	TIME	
DAC	DPG	DTC	NAVY	BIO	CIV	MIL		FROM	TO
								1	30
		X				1	Test Director	Apr	Jun
		X			1		Ass. Test Dir.	"	"
		X			1		Admin. Officer	"	"
		X			1		Meteorologist	"	"
			X**			3	Met. Technician	"	"
			X**			25	Laboratory Pers.	"	"
			X**			1	Safety Officer	"	"
	X		X**		1	1	Photographer	"	"
			X**			5	Dissem. Crew	"	"
	X				1		Dissem. Crew	"	"
			X*3			100	Sampler Crew	"	"
	X				5		Sampler Foremen	"	"
			X**			5	Ch, Sampler Crew	"	"
		X				1	Munitions Techn.	"	"
	X				1		Munitions Techn.	"	"
			X*5			2	Pilot, Jet	"	"
			X*5			2	Pilot, Helicop.	"	"
			X*5			3*4	Aircraft Crew	"	"
X					5		Mobile Lab.	"	"
					16	149			

** SHAD crew personnel
*3 The 100 personnel will be the normal crew aboard the Navy vessels (25 men per vessel)
*4 The number will depend upon the type of aircraft furnished.
*5 The jet aircraft, helicopters, pilots, and crews will be supplied and maintained by the 13th. Marine Air Group, Marine Corps Air Station, Kaneohe, Hawaii

[redacted]

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509517

DA Project No
1X 650212D619

Report No DTC 644115R

Test 64-4 -- SHADY GROVE [redacted] (U)

FINAL REPORT

June 1966

by
Ernest H Buhlman (Plans Officer)

Headquarters • Deseret Test Center • Fort Douglas, Utah • 84113

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322 Pages

Classification of Pages

Secret Pages i iii, iv vi thru xv 1 thru 9, 14 thru 17 19 thru 89, 91 thru 94 98 thru 109 111 thru 116, 120, 123, 124, 126 128 thru 167 169 thru 171 175 thru 177 179 thru 195 197 thru 263 265 thru 275, 277, 305 306

Confidential Pages ii, v, 10 thru 13 18 95 thru 97 117 thru 119 172 thru 174 178

Unclassified Pages xvi 90, 110 121, 122 125 127 168 196, 264 276 278 thru 304

509517

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[redacted]

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INTRODUCTION (U)

1. [redacted] BACKGROUND

[redacted]

2. [redacted] SCOPE

a. This test consisted of 25 trials, divided into three phases: A, B, and D.

(1) Phase A. This phase consisted of eight trials which were to serve as a preliminary check of all test procedures prior to conducting the pathogenic agent phases and to obtain data to characterize diffusion in a marine environment. These trials involved release of the biological tracer material BG. Details of Phase A are presented in the meteorological section (Part III) and Appendix A.

(2) Phase B. This phase consisted of 13 trials wherein agent UL and biological tracer BG were simultaneously released in order to obtain data on decay and infectivity.

(3) Phase D. This phase consisted of four trials involving the simultaneous release of agent OU and tracer BG to obtain data on decay.

b. This report is divided into three parts:

Part I...pertains to all aspects of Phase-B trials.

Part II...covers all aspects of Phase-D trials.

Part III...covers all aspects of meteorology, including atmospheric diffusion characteristics and model fitting, as well as aspects of Phase-A trials.

(S) SECTION III

TEST PROCEDURES (U)

1. [redacted]

2. [redacted]

[redacted]

3. [redacted] AGENT MATERIAL

[redacted] Protective additives were included to enhance the aerosol survival of the agent in adverse meteorological environments. Additives were mixed with the UL concentrate as follows: five percent raffinose; 0.1 percent dipyridyl.

[redacted]

4. [redacted]

[redacted]

JCP-I, DPG

UNCLASSIFI[redacted]

[redacted]

AD _____

Reviewed By: [signature]

Report Number: DTC 651108R

TEST 65-1 -- COPPER HEAD (U)

FINAL REPORT

MARCH 1966

Prepared by

HEADQUARTERS • DESERET TEST CENTER • FORT DOUGLAS, UTAH

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TEST 65-1 -- COPPER HEAD. (U)

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DESERET TEST CENTER FORT DOUGLAS UT

MAR 1966

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ABSTRACT

COPPER HEAD was designed to study ship penetration and downwind cloud diffusion in a frigid marine environment. The biological tracer, *Bacillus subtillis* var. *niger* (BG), was disseminated from an Aero 14B spray tank mounted on an A-4 type jet aircraft. [redacted] A contractor aircraft attempted congruent releases of fluorescent particles (FP) just after the BG release. [redacted]

UNCLASSIFIED [redacted]

[redacted] UNCLASSIFIED

[redacted]

(8)(U)

PREFACE

[redacted]

The testing was conducted at sea during the period, January-February 1965, off the coast of Newfoundland, Canada.

[redacted]

[redacted] UNCLASSIFIED

SECTION II

ACCOMPLISHMENT OF TEST OBJECTIVES (U)

1. PRIMARY OBJECTIVES

a. The first primary objective was to determine the percentage of aerosol penetration (and its relation to particle size) into an operational ship under three conditions of readiness in a frigid environment.

b. The second primary objective was to compare biological cloud travel in a frigid marine environment with predicted cloud travel based on diffusion models for prevailing conditions.

2. SECONDARY OBJECTIVES

a. The first secondary objective was to determine if a ship's passage--in a frigid, marine environment--through biological aerosols generated by a current line-source, aerial-spray-tank weapon system resulted in contamination of exterior and interior surfaces of the ship.

b. The second secondary objective was to determine if a betapropiolactone-spray system could be employed under operational conditions to decontaminate an interior compartment of a ship after exposure to a biological aerosol in a frigid marine environment.

c. The third secondary objective was to determine the operational feasibility of an installed exterior deck-wash-down system in a frigid, marine environment.

[redacted]

d. The fourth secondary objective was to obtain information on the performance of an Aero-14B-spray tank jet-aircraft weapons system disseminating BG over the open sea in a frigid marine environment. [redacted]

[redacted]

[redacted]

[redacted] UNCLASSIFIED

(S) [redacted] SECTION III

TEST PROCEDURES (U)

1. (U) (S) TEST LOCATION

The test location was off the coast of Newfoundland, Canada, in international waters. Area coordinates were 46° to 46° 40'N 54° to 56°W. The base of operations was the U.S. Naval Station, Argentia, Newfoundland. Marine and contractor aircraft support was stationed at Ernest Harmon Air Force Base, Newfoundland. (See Fig 1).

2. (U) (C) TARGET SHIP

a. The test ship was USS POWER, DD 839, [redacted]

3. [redacted]

a. [redacted]

[redacted] UNCLASSIFIED

[redacted] UNCLASSIFIED

(UNCLASSIFIED)

[redacted]

5. (S) (U) TRIAL SUMMARY

Table 1 summarizes the scope and conditions for this test series.

TABLE 1 (S) (U) TRIAL SUMMARY (U)

[redacted]

Trial	Date	[redacted]
1	24 Jan 65	
2*	2 Feb 65	
3	7 Feb 65	
4	12 Feb 65	
5	15 Feb 65	
6	16 Feb 65	
7	18 Feb 65	
8	18 Feb 65	
9	24 Feb 65	
10	25 Feb 65	

[redacted]

* Aerosols missed target ship--no data obtained.

[redacted]

* Aerosols missed target ship--no data obtained.

4. [redacted] TRIAL PROCEDURE

[redacted]

[redacted] Immediately following the release of each BC line source, a C47 aircraft flew an approximate congruent pattern [redacted] and released FP. [redacted]

5. TRIAL SUMMARY

Table 1 summarizes the scope and conditions for this test series.

TABLE 1 TRIAL SUMMARY (U)

[redacted]

Trial	Date	[redacted]
1	26 Jan 65	
2*	2 Feb 65	
3	7 Feb 65	
4	12 Feb 65	
5	13 Feb 65	
6	16 Feb 65	
7	18 Feb 65	
8	20 Feb 65	
9	24 Feb 65	
10	25 Feb 65	

[redacted]

* Aerosols missed target ship--no data obtained.

[redacted]

[redacted]

[redacted]

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Deseret Test Center Final Report
TEST 63-1

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AD 366572 509519

*E A G E R   B E L L E (U)

Phase I

(Revised)

[redacted]

Prepared by

HEADQUARTERS
Deseret Test Center
Fort Douglas, Utah

30 June 1965

[redacted]

118 Pages

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[redacted]

[redacted]

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R869

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ABSTRACT

1. A test series was conducted to study the effectiveness of selected protective devices in preventing penetration of a naval ship by a biological aerosol. [redacted] A secondary objective of the tests was to compare the efficiency of the M-17 and the Mark V protective masks against a biological aerosol.

2. The target ship (YAG 39) was exposed to an average dosage of [redacted] disseminated from a continuous point source installed on a tugboat. [redacted]

[redacted]

[redacted]

FOREWORD

1. This Final Report outlines the work accomplished during the biological operations test series--EAGER BELLE (U), Phase I--conducted in the vicinity of Hawaii during the months of January and March 1963.

[redacted]

Eager Belle, Phase 2

JCP-1, DPG 1

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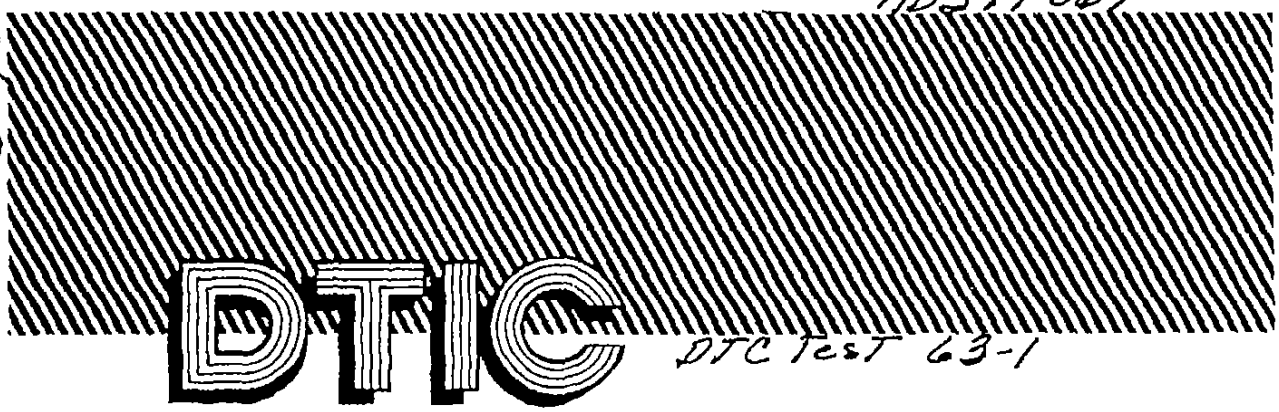

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(U) [redacted]

FOREWORD

1. [redacted] This Final Report outlines the work accomplished during the biological operations test series -- nicknamed EAGER BELLE (U), Phase II -- conducted in the vicinity of Hawaii during the months of February, March, and June 1963.

[redacted]

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[redacted]

[redacted]

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[redacted]

[redacted]

ABSTRACT

1. (S) Test were conducted over the Pacific Ocean to study the downwind travel of biological aerosols. [redacted] was released as a line source generated by Aero 14B spray tanks mounted on A4 series jet attack aircraft. [redacted]

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[redacted]

[redacted]

SECTION II

ACCOMPLISHMENT OF TEST OBJECTIVES (U)

[redacted]

2. PRIMARY OBJECTIVES

a. First Primary Objective

(U) "To relate biological aerosol cloud travel to predicted cloud travel based on present prediction models for prevailing conditions."

[redacted]

b. Second Primary Objective

(U) "To obtain additional information on weapon system performance (Aero 14B Spray Tank disseminating the biological tracer, BG) over the open sea under the meteorological conditions encountered."

[redacted]

c. Third Primary Objective

(U) "To obtain information to assist in the design and execution of future trials."

[redacted]

[redacted]

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[redacted]

[redacted]

3. SECONDARY OBJECTIVE

(h) ⇒ "To provide information on the performance of a particle-size analyzer (being developed by the U.S. Army Biological Laboratories) under the environmental conditions of this test."

[redacted]

[redacted]

[redacted]

SECTION III

TEST PROCEDURES, RESULTS, AND DISCUSSION (U)

1. PRIMARY OBJECTIVES

[redacted]

TABLE I (UNCLASSIFIED): SUMMARY FEATURES OF TRIALS

No. of Trials	Trials	No. of Line Sources	Diss. Alt. (ft)	Diss. Line length (ft)	Target Ship(s)	Distance of Lines From Target Ships (ft)	No. Spray Tanks Per Line
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	YAG 39	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	YAG 39 YAG 39	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	YAG 39	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	DD 825 APA 215 LST 1158	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

(2) Operational Control

(u)
(a) An EC-121 radar-equipped AEW aircraft [redacted] the laboratory ship, YAG 40, [redacted]

[redacted]

[redacted]

2001235-000001

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[redacted]

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Report Number DTC 642110R

TEST 64-2 -- FLOWER DRUM (U)
Phase I
FINAL REPORT — REVISED

DECEMBER
1965

Prepared by
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[redacted]

ABSTRACT

FLOWER DRUM (U), Phase I, as amended, designates a test designed to find a simulant for agent GB, to assess shipboard vulnerability to an enveloping vapor of toxic agent, and to establish comparative penetration properties for GB simulant and agent. The USS GEORGE EASTMAN (YAG 39), a specially designed and equipped test ship, was subjected to attack by candidate agent GB simulants and agent GB. The ship attack was by envelopement of test agent disseminated from a gas turbine mounted on the bow of the test ship and by simulated envelopment--direct injection of test agent into the air supply system. [redacted] Trials of candidate simulant sulfur dioxide, and agent GB were run. [redacted] After investigating other simulant candidates, methyl acetoacetate, MAA, was selected and subjected to comprehensive, comparative tests. [redacted]

[redacted]

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PREFACE

[redacted]

. The testing at sea was conducted over the periods February thru April and August thru September 1964, off the coast of Hawaii.

[redacted]

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SECTION II

ACCOMPLISHMENT OF TEST OBJECTIVES (U)

1. [redacted] PRIMARY OBJECTIVE

a. The primary objective of FLOWER DRUM Phase I, as amended, was to obtain comparative information on the penetrability of ships exposed to agent GB and a suitable simulant; this involved finding a simulant for agent GB suitable for ship envelopment and penetration studies, establishing comparative penetration properties for GB simulant and agent GB, and assessing ship penetrability or vulnerability to an enveloping vapor of toxic agent GB. The experiments were to be accomplished under four test conditions; also, they were to include the testing of specific installed protective systems.

[redacted]

2. [redacted] SECONDARY OBJECTIVE

a. The secondary objective was to report information applicable to the Navy's Chemical Training Program.

[redacted]

[redacted]

[redacted]

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3. [redacted] ADDITIONAL OBJECTIVES

a. Additional Objectives were:

(1) To obtain information on the performance of the E41 V-G Agent Alarm System and the Hydrogen Flame Emission Detector (HYFED) candidate point sampling alarms (modified for shipboard use) when exposed to a cloud of GB.

(2) To obtain information on the performance of the Passive Long Path Infrared (LOPAIR) advance warning alarm (modified for shipboard use) when exposed to a cloud of GB.

[redacted]

[redacted]

[redacted]

[redacted]

SECTION III

TEST PROCEDURES (U)

1. [redacted] TEST LOCATION

The test location was off Hawaii in an area assigned by COMHAWSEAFRON. [redacted]

2. [redacted] ESCORT SHIP

The USS GRANVILLE S. HALL (YAG 40), [redacted]

3. [redacted] TEST SHIP

a. [redacted] the USS GEORGE EASTMAN (YAG 39) [redacted]

[redacted]

[redacted]

4. [redacted] SHIPBOARD MATERIAL READINESS CONDITIONS

[redacted]

a. The four material conditions were as follows:

1) ZEBRA

This is a material readiness condition set at or near battle; it is designed mainly to facilitate fire and flood control and is a "standard" Navy material readiness condition. Under this condition, the deckhouse ventilation system remained operative and maximum watertight integrity was maintained, with as much compartmentation as possible.

2) ZEBRA CIRCLE WILLIAM

This is also a "standard" Navy material readiness condition. Under this condition, all ventilation

[redacted]

[redacted]

fans were secured, and all CIRCLE WILLIAM fittings were closed; however, there were no improvised closures over the ventilation system intakes or exhausts.

3) Modified ZEBRA CIRCLE WILLIAM

This is an experimental material readiness condition which, theoretically, could be set on all combatant ships as a CBR protective measure. Under this condition, all ventilation systems were secured; covers for all intakes and exhausts--which on most ships must be improvised--were closed. The intent was to completely seal off interior spaces from external contamination. It is apparent that this condition cannot be rapidly set because of the many ventilation intake and exhaust coverings that have to be jury-rigged; nor can it be maintained indefinitely because of the need for ventilation of the engineering spaces.

4) MAXIMUM CBR SECURITY

This was an experimental condition in which the air supply to the deckhouse test area was filtered through an M16 gas-particulate filter. Under this condition, all fittings and ventilation exhausts were closed, and the chemically pure supply air created a positive pressure in the deckhouse of 0.5 cm (0.2 in.) of water; the exhaust air flowed outward through leaks and natural vents. This condition caused the deckhouse to be under "collective" protection.

[redacted]

[redacted]

[redacted]

b. The YAG 39 was enveloped by disseminating the test agent from a modified Model T-45M-2 MARS Portable Gas Turbine which was placed on the helicopter deck at the bow of the ship [redacted]

[redacted]

[redacted]

6. [redacted] TRIAL PROCEDURES

a. During the trials, the target ship (YAG 39) steamed into the wind maintaining a relative windspeed of 10 to 30 knots. The YAG 40 maintained a parallel course forward and starboard of the target ship. When the appropriate material condition was set and all personnel except the disseminator crew were within the Safety Citadel, agent GB or simulant was disseminated for 10 minutes--from the MARS turbine on the bow for envelopment trials or by direct injection into the ventilation system intake; dissemination was effected at a rate which maintained an average concentration of approximately 50 mg/m^3 at the forward deckhouse bulkhead.

b. During GB dissemination, the disseminator crew wore M5 protective ensembles and all other personnel (who were in the Safety Citadel) wore MK5, M7A1, or M17 protective masks. After dissemination ceased, all personnel whose duties required them to leave the Safety Citadel wore protective masks until the ship was cleared of GB. During the dissemination period of

ship was cleared of GB. During the dissemination period of

[redacted]

[redacted]

the simulant trials, all personnel wore protective masks. During test periods, the only entrance to or exit from the Safety Citadel was thru a decontamination tunnel which consisted of a passageway that functioned as an air-sweep tunnel for the decontamination facility and also as one of two primary ventilation exhausts for the Safety Citadel. The passageway was divided into four sections by perforated doors; the doors restricted the rate of airflow and maintained the interior/exterior pressure differential. The decontamination tunnel was outfitted with a gas chamber to be used for a protective mask check, shower facilities (not used during the test of vapor agents), and protective equipment and clothing removal facilities. All personnel worked in teams (of two or more persons) and all teams were checked in and out of the Safety Citadel.

[redacted]

e. Following the termination of sampling, a full aeration of the ship was accomplished. For the GB trials, aeration of the ship was continued until the enzyme ticket test of the M15A1 Detector Kit indicated there was no GB in the exhaust air. When negative results were obtained at the exhaust vents, properly protected personnel confirmed the absence of GB within each area--again using the enzyme ticket test of the M15A1 Detector Kit.

JCP-1,DPG

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Report Number DTC 642105R

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AD 352 73

TEST 64-2 — FLOWER DRUM (U)

Phase II

FINAL REPORT

OCTOBER
1965

Prepared by

HEADQUARTERS • DESERET TEST CENTER • FORT DOUGLAS, UTAH

AD 352

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Date 1 October 1965

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ABSTRACT

(U) The FLOWER DRUM, Phase II, test was conducted at sea in a tropical environment to determine the effectiveness of a shipboard water-washdown system as a protective and decontaminant measure against simulated aerial delivery of agent VX spray. Also, testing was conducted to provide information for the planning of FEARLESS JOHNNY (U), DTCTP 65-17, another Deseret Test Center shipboard test. [redacted]

SECTION I

INTRODUCTION (U)

3. (S) TESTING

(U) — a. Trials were conducted in accordance with the FLOWER DRUM (U) Phase II, Test Plan, DTC 64-2 as amended.

[redacted]

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[redacted] nase II, Test Plan, DTC 64-2 as amended.

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(U) — b. Three conditions of shipboard water washdown were tested to determine their effectiveness as protective and decontaminant measures against simulated, aerial delivery of agent VX spray. The three conditions were as follows:

(U) — 1) Condition 1 Washdown system was in operation before, during, and after agent dissemination.

(U) — 2) Condition 2 Agent dissemination occurred soon after the washdown system was turned off, but while the exposed surfaces were still wet. The washdown system was again actuated after agent dissemination was completed.

(U) — 3) Condition 3 Washdown system was not operating prior to or during agent dissemination, but was actuated after agent dissemination was completed.

JCP-1,DRC [redacted]

SECTION II

ACCOMPLISHMENT OF TEST OBJECTIVES (U)

1. TEST OBJECTIVES

This section restates the test objectives as originally presented in the FLOWER DRUM, Phase II, Test Plan. It indicates the degree to which each test objective was accomplished. The objectives were:

1) To investigate the effectiveness of shipboard water washdown, both as a protective and as a decontaminant measure, against agent VX delivered from a mechanism that simulates aerial spray.

2) To obtain data and operational experience to contribute to the planning and operation of FEARLESS JOHNNY[1] (U), DTCTP 65-17.

[redacted]

[redacted]

SECTION III

(U) TEST EQUIPMENT AND PROCEDURES (U)

1. (U) TEST LOCATION AND DATE

(U) This test program was conducted at sea during November and December 1964, off the Island of Oahu.

2. (U) AGENT UTILIZED

(U) A dyed liquid containing approximately 90-percent VX (by weight) was used in this program. To assist in taking radiometric measurements of contamination, radioactive "tagged VX" molecules containing the radioactive isotope, Phosphorus 32, were included in the agent.

3. (U) TEST VEHICLE

(U) a. Barge

The U.S. Navy Covered Lighter (Barge), YFN 811, was used as the basic structure for the test arrangement.

[redacted]

[redacted]

[redacted]

c. Test Vehicle Propulsion

(U) During the trials, the test vehicle was towed by the U.S. Navy Tug, ATF 105. It was towed approximately 1km (0.62 mi) behind the tug.

4. [redacted] TEST EQUIPMENT

a. Dissemination Apparatus

[redacted]

(2) [redacted] Bis (U)
(2 ethyl-hexyl) hydrogen phosphite, [redacted]