

UNCLASSIFIED

AD NUMBER	
ATI072790	
CLASSIFICATION CHANGES	
TO:	unclassified
FROM:	confidential
LIMITATION CHANGES	
TO: Approved for public release; distribution is unlimited. Document is partially illegible.	
FROM: Distribution authorized to DoD only; Administrative/Operational Use; Aug 1949. Other requests shall be referred to Naval Proving Ground, Dahlgren, VA.	
AUTHORITY	
Naval Surface Weapons Center notice dtd 4 Jun 1975	

THIS PAGE IS UNCLASSIFIED

UNCLASSIFIED

AD NUMBER
ATI072790
CLASSIFICATION CHANGES
TO
confidential
FROM
restricted
AUTHORITY
Naval Proving Ground ltr dtd 30 Dec 1953

THIS PAGE IS UNCLASSIFIED

Reproduction Quality Notice

This document is part of the Air Technical Index [ATI] collection. The ATI collection is over 50 years old and was imaged from roll film. The collection has deteriorated over time and is in poor condition. DTIC has reproduced the best available paper copy utilizing the most current imaging technology. ATI documents that are partially legible have been included in the DTIC collection due to their historical value.

If you are dissatisfied with this document, please feel free to contact our Directorate of User Services at [703] 767-9066/9068 or DSN 427-9066/9068.

**Do Not Return This Document
To DTIC**

and Mine Component Testing Under Task Assignment
Report on Aircraft Drops of Mines, Mk. 45, Equipped
Surface Parachutes - and Appendixes A-D (NPG*

72790

(None)

and, Dahlgren, Va.

346

English

16

photos, table

(Same)

(TAS) and the amount of oscillation were determined for the 45 in. mines with each of two (straight and crossed) types of shroud line connectors as the parachute load. This test is part of a program to develop tests for aircraft laid mines. The ten parachutes tested withstood opening sea speeds up to 430 knots as well as quickly damping the large mine load flight for the Mk 45 mines. Oscillation of the mines equipped with engagement was negligible after damping. The mines equipped with engagement oscillated very slightly during the entire flight of the mine.

obtainable from CADO.

Mines, Parachute

2)

AIR DOCUMENTS DIVISION, T-2
AMC, WRIGHT FIELD
MICROFILM No.

R 3475 F

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

REPORT NO. 346

MINE AND MINE COMPONENT TESTING
UNDER
TASK ASSIGNMENT NPG-33-Re6b-311-1

6th Partial Report

AIRCRAFT DROPS OF MINES, MK. 45,
EQUIPPED WITH 45 INCH DIAMETER
GUIDE SURFACE PARACHUTES

FINAL Report

Copy No. _____

Task

Assignment NPG-33-Re6b-311-1

Classification RESTRICTED

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

PART A

SYNOPSIS

1. This is a report on aircraft drops of Mines, Mk. 45, equipped with 45 inch diameter guide surface parachutes, to determine the maximum launching velocity (true air speed) and the amount of oscillation. Two types of shroud line configuration were provided, crossed and straight.

2. It is concluded that:

a. The ten parachutes tested withstood opening shock without damage at release speeds up to 430 knots (TAS).

b. The ten parachutes tested quickly damped the large mine oscillations and provided good flight for the Mines, Mk. 45.

c. Oscillation of the mines equipped with "straight" shroud line arrangement was negligible after damping. The mines equipped with "crossed" shroud line arrangement oscillated very slightly during the entire flight of the mine.

d. The pack cover plates separated from the chutes at or immediately after chute opening on all drops. The metal plate and "U" bolt pulled through the fiber glass pack cover in each of five drops; the retaining line broke in each of the remaining five drops.

e. The center stud neck failed to shear in each of four releases.

3. It is recommended that:

a. The method of securing the pack cover to the chute be strengthened, consideration being given to:

- (1) Increasing the size of the metal strengthening plate.
- (2) Using strengthening plates on both sides of the cover.
- (3) Using a "U" bolt of larger span.
- (4) Using a stronger retaining line, with consideration being given to a shorter line to reduce whip during flight.

NPG REPORT NO. 346

Aircraft Drops of Mines, Mk. 45
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

TABLE OF CONTENTS

	<u>Page</u>
SYNOPSIS.	1
TABLE OF CONTENTS	2
AUTHORITY	3
REFERENCES.	3
BACKGROUND.	3
OBJECT OF TEST.	3
PERIOD OF TEST.	4
REPRESENTATIVES PRESENT	4
DESCRIPTION OF ITEM UNDER TEST.	4
DESCRIPTION OF TEST EQUIPMENT	5
PROCEDURE	5
RESULTS AND DISCUSSION.	5
CONCLUSIONS	6
RECOMMENDATIONS	7
DISPOSITION OF MATERIAL	7
APPENDIX A - NPG MOVIE NO. 813.	(ORIGINAL ONLY, DELIVERED BY HAND TO NAVAL ORDNANCE LABORATORY, FIELD EVALUATION DIVISION.)
APPENDIX B- NPG PHOTOGRAPHS	FIGURES 1 - 2 (Incl)
APPENDIX C - TABULATED RESULTS.	TABLE I
APPENDIX D - DISTRIBUTION	PAGES 1 - 2 (Incl)

Aircraft Drops of Mines, Mk. 45
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

PART B

INTRODUCTION

1. AUTHORITY:

This test was requested by reference (a), and was conducted under Task Assignment No. NPG-33-Re6b-311-1 authorized by reference (b). Reference (a) requested that the test be conducted in accordance with the outline in reference (c).

2. REFERENCES:

- a. NOL Restricted Speedltr. NP51/F43-1(1-265) dated 18 May 1949.
- b. BuOrd ltr. NP9(Re6b) dated 3 September 1948.
- c. NOL TSS No. 5609.
- d. NPG Restricted Report No. 304 dated 31 May 1949.

3. BACKGROUND:

a. This test is part of a program to develop more satisfactory parachutes for aircraft laid mines.

b. Reference (d) is the report of a test to determine the operation and flight characteristics of 45 inch diameter Guide Surface Parachutes and to determine the terminal velocity of the Mine, Mk. 45, equipped with this parachute.

4. OBJECT OF TEST.

This test was conducted to determine the maximum launching velocity (true air speed) and the amount of oscillation of the 45 inch diameter Guide Surface Parachutes with each of two types of shroud line configuration using Mk. 45 Mines as the parachute load.

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

5. PERIOD OF TEST:

a. Date of Project Letter	18 May 1949
b. Date Necessary Material Received	25 May 1949
c. Date Commenced Test	6 June 1949
d. Date Completed Test	6 June 1949

6. REPRESENTATIVES PRESENT:

G. L. Fogal	Naval Ordnance Laboratory
E. C. Ripley	" " "

PART CDETAILS OF TEST

7. DESCRIPTION OF ITEM UNDER TEST:

a. The guide surface parachutes used in this test were identical to those reported in reference (d) except that:

(1) The parachute pack cover was secured to the apex of the parachute by an 8-1/2 ft. length of 950 lb. strength nylon cord as shown in Figure 1.

(2) Two strands of 50 lb. strength nylon cord were attached to the static line and secured to the apex of the chute as shown in Figure 1 to pull the chute from the pack after release of the cover.

b. The Pack Housing, XH-5B, was identical to that reported in reference (d) except that a "U" bolt was inserted from the bottom of the cover through a metal plate approximately 1" x 2" on the top side of the cover for securing the cord described in paragraph 7, a. (1) above. Figure 2 shows the "U" bolt head and metal plate.

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

8. DESCRIPTION OF TEST EQUIPMENT:

a. Drops were made from the fuselage installation of an F7F-3 type aircraft which has been equipped with a Mk. 51 Mod. 12 bomb rack.

b. A Mitchell camera with 17-inch lens was used to photograph the release of the mines and operation of the parachutes from the ground. A clock with a one-second sweep was included in the corner of each frame. This was supplemented by visual observation.

9. PROCEDURE:

a. Ten inert Mines, Mk. 45, equipped with 45 inch diameter guide surface parachutes were launched from the fuselage installation of an F7F-3 type aircraft in approximately level flight at time of release. Altitudes of release varied between 1500 and 3000 feet indicated. True airspeeds at release varied between 400 and 430 knots.

b. The performance of the parachutes was determined from the film from the Mitchell Camera, supplemented by visual observation of the drops and inspection of the recovered units.

10. RESULTS AND DISCUSSION:

a. The first five units, using "crossed" shroud line arrangement, were dropped at true airspeeds of 400 knots to 428 knots. The parachutes opened and held without damage, quickly damping the large oscillations. All five units had good flight with very slight oscillation. The pack cover stayed on the chute for two seconds of flight on the first drop. The remaining four separated at opening of the chutes.

b. The second five units, using "straight" shroud line arrangement, were dropped at true airspeeds of 422 knots to 430 knots. The parachutes opened and held without damage, quickly damping the large oscillations. All five units had good flight with negligible oscillation. The pack covers separated from the chutes at opening.

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

c. The center stud neck failed to shear in each of four releases.

d. The metal plate and "U" bolt pulled through the fiber glass pack cover on each of five drops; the retaining line broke on each of the remaining five drops.

e. Tabulated performance data are shown in Table I.

f. Film from the ground camera is included as Appendix (A).

PART D

CONCLUSIONS

11. It is concluded that:

a. The ten parachutes tested withstood opening shock without damage at release speeds up to 430 knots.(TAS)

b. The ten parachutes tested quickly damped the large mine oscillations and provided good flight for the Mines, Mk. 45.

c. Oscillation of the mines equipped with "straight" shroud line arrangement was negligible after damping. The mines equipped with "crossed" shroud line arrangement oscillated very slightly during the entire flight of the mine.

d. The pack cover plates separated from the chutes at or immediately after chute opening on all drops. The metal plate and "U" bolt pulled through the fiber glass pack cover in each of five drops; the retaining line broke in each of the remaining five drops.

e. The center stud neck failed to shear in each of four releases.

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

PART E

RECOMMENDATIONS

12. It is recommended that:

a. The method of securing the pack cover to the chute be strengthened, consideration being given to:

(1) Increasing the size of the metal strengthening plate.

(2) Using strengthening plates on both sides of the cover.

(3) Using a "U" bolt of larger span.

(4) Using a stronger retaining line, with consideration being given to a shorter line to reduce whip during flight.

PART F

DISPOSITION OF MATERIAL

13. The ten parachutes tested were recovered for the representatives. The mine cases were recovered for reuse.

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

PREPARED BY:

J. B. King
J. B. KING
Project Engineer

SUBMITTED:

L. G. Hansen
L. G. HANSEN
Lieutenant Commander, USN
Aviation Ordnance
Special Projects Officer

CONCUR:

M. P. Bagdanovich
M. P. BAGDANOVICH
Captain, USN
Aviation Ordnance Officer

CONCUR:

W. C. Bryson
W. C. BRYSON
Captain, USN
Experimental Officer

APPROVED: C. T. JOY
Rear Admiral, USN
Commander, Naval Proving Ground

C. H. Anderson
C. H. ANDERSON
Captain, USN
Ordnance Officer
By direction

NPG REPORT NO. 346

RESTRICTED

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

Sixth Partial Report

on

Mine and Mine Component Testing

under

Task Assignment NPG-33-Re6b-311-1

Final Report

on

Aircraft Drops of Mines, Mk. 45,

Equipped with 45 Inch Diameter

Guide Surface Parachutes

Project No. NPG-33-Re6b-311-1
No. of Pages: 8

Date:

3 AUG 1949
RESTRICTED

AT No. 72790
COPY

NPG REPORT NO. 346

RESTRICTED

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

NPG MOVIE NO. 813

(ORIGINAL ONLY, DELIVERED BY HAND
TO NAVAL ORDNANCE LABORATORY,
FIELD EVALUATION DIVISION.)

NP9 38725 - Parachute Pack Housing, XH-5B, showing the pack cover retaining
line and the tie cord for pulling the chute from the pack.
6 June, 1949

RESTRICTED



Figure 1

NP9 38726 - Parachute Pack Housing, XH-5B, showing the ends of the "U"
bolt protruding through the pack cover and the metal strengthen-
ing plate.
9 June 1949

RESTRICTED

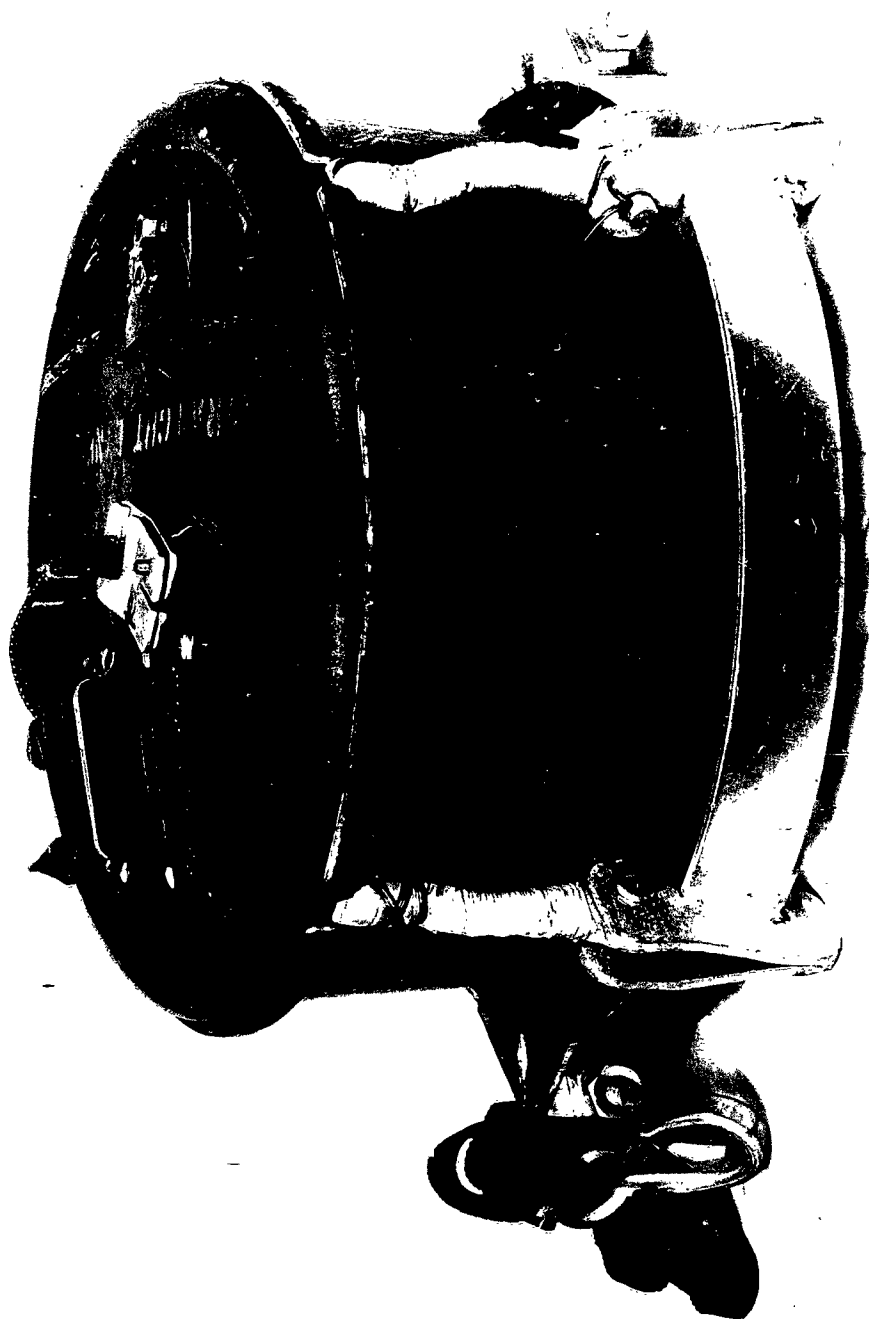


Figure 2

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

TABULATED RESULTS

6 June 1949

Drop No.	Altitude (ft.)	True Airspeed (Knots)	Weight (lbs)	Shroud Line Arrangement	Remarks
1	1700	400	not weighed	"Crossed"	Parachute opened and held without damage. Good flight-very slight oscillation-cover plate came off after two seconds of fall.
2	1500	415	not weighed	"Crossed"	Parachute opened and held without damage-Good flight-slight oscillation-cover came off at chute opening.
3	1800	420	384.0	"Crossed"	Same as drop No. 2.
4	2000	425	412.5	"Crossed"	Same as drop No. 2.
5	2150	428	387.0	"Crossed"	Same as drop No. 2.
6.	2200	422	406.0	"Straight"	Parachute opened and held without damage. Good flight-cover came off at chute opening-oscillation negligible.
7	3000	430	406.0	"Straight"	Same as drop No. 6.
8	2300	431	405.0	"Straight"	Same as drop No. 6.
9	1700	422	407.0	"Straight"	Same as drop No. 6.
10	2000	426	404.5	"Straight"	Same as drop No. 6.

RESTRICTED
APPENDIX C

NPG REPORT NO. 346

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide Surface Parachutes.

DISTRIBUTION

Bureau of Ordnance:

Ad3	2 (w/o Appendix (B))
Re6	1 (w/o Appendix (B))
Re6b	1 (w/o Appendix (B))

Chief of Ordnance, Department of the Army	2 (w/o Appendix (B))
--	----------------------

Commanding General Aberdeen Proving Ground, Aberdeen, Md. Attn: Technical Information Section Development & Proof Services	1 (w/o Appendix (B))
---	----------------------

Naval Gun Factory Attn: Aircraft Armament Section	1 (w/o Appendix (B))
--	----------------------

Naval Ordnance Laboratory Attn: Technical Evaluation Dept. Field Evaluation Division	1 (w/o Appendix (B)) 1 (with Appendix (B))
--	---

Bureau of Aeronautics Attn: Armament Section	2 (w/o Appendix (B))
---	----------------------

NATC, Patuxent River, Md.	3 (w/o Appendix (B))
---------------------------	----------------------

NAOTS, Chincoteague, Va.	1 (w/o Appendix (B))
--------------------------	----------------------

Air Material Command Liaison Officer Wing 3 Headquarters, Aberdeen Proving Ground, Aberdeen, Md.	2 (w/o Appendix (B))
--	----------------------

Naval Air Development Station, Johnsville, Pa.	1 (w/o Appendix (B))
---	----------------------

NPG REPORT NO. 346

Aircraft Drops of Mines, Mk. 45,
Equipped with 45 Inch Diameter
Guide ~~Surface~~ Parachutes.

DISTRIBUTION (Cont'd)

Naval Liaison Officer,
USAFPGC, Eglin Field, Fla.

1 (w/o Appendix (B))

U. S. Air Force
AMC Engineering Field Office
Room 1833, Main Navy Building,
Navy Department,
Washington 25, D. C.

2 (w/o Appendix (B))

Local:

RX
RO
File

1 (w/o Appendix (B))
1 (w/o Appendix (B))
1 (w/o Appendix (B))

TITLE: Sixth Partial Report on Mine and Mine Component Testing Under Task Assignment
NPG-33-Refb-311-1 - Final Report on Aircraft Drops of Mines, Mk. 45, Equipped
With 45 Inch Diameter Guide Surface Parachutes - and Appendices A-D (NPG*

AUTHOR(S) : King, J. B.

ORIG. AGENCY : Naval Proving Ground, Dahlgren, Va.

PUBLISHED BY : (Same)

DATE	U.S. CLASS.	COUNTRY	LANGUAGE	PAGES	ILLUSTRATIONS
Aug' 49		U.S.	English	16	photos, table

ABSTRACT:

The max launching velocity (TAS) and the amount of oscillation were determined for the 45 (QVIA) diam guide surface parachutes with each of two (straight and crossed) types of shroud line configurations using Mk 45 mines as the parachute load. This test is part of a program to develop more satisfactory parachutes for aircraft laid mines. The ten parachutes tested withstood opening shock without damage at release speeds up to 430 knots as well as quickly damping the large mine oscillations and providing good flight for the Mk 45 mines. Oscillation of the mines equipped with "straight" shroud line arrangement was negligible after damping. The mines equipped with "crossed" shroud line arrangement oscillated very slightly during the entire flight of the mine.

*Report)

DISTRIBUTION: Copies of this report obtainable from GADO.

SUBJECT HEADINGS: Mines, Parachute

DIVISION: Ordnance and Armament (22)

SECTION: Torpedoes and Mines (9)

NTIS, AUTH:

WNSWC notice, 4 Jan 75

251 575

Central Air Documents Office

Wright-Patterson Air Force Base, Dayton, Ohio

CADO TECHNICAL INDEX

ATI- 72790

REVISION

(None)

ORIG. AGENCY NO.

346

PUBLISHING AGENCY NO.

(Same)

CONFIDENTIAL

Exempt from automatic downgrading and declassification

Auth: AFI 10-101

(E.O. 10101)

Auth: AFI 10-101

U.S. Naval

U

Auth: USNSAC notice, 4 Jun 75-

12 Jan 54