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NPG REPORT NO. 669

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Twentieth Partial Report

on

"Mine and Mine Component Testing

under

Task Assignment NPG-33-Re6b-311-1"

Final Report

on

"Aircraft Drops of Parachute, XG-18B,
Assembled on Mine, Mk. 25 Mod. 1"

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Project No.: NPG-33-Re6b-311-1
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NPG REPORT NO. 669

Aircraft Drops of Parachute, XG-18B,
Assembled on Mine, Mk. 25 Mod. 1

PART A

SYNOPSIS

1. This is a final report on Aircraft Drops of Parachute, XG-18B, assembled on Mine, Mk. 25 Mod. 1, conducted under Task Assignment No. NPG-33-Re6b-311-1.
2. This test was conducted to determine the maximum launching velocity the subject parachute could withstand when assembled on Mine, Mk. 25 Mod. 1, flight characteristics of the mine-parachute combination, and terminal velocity of the mine-parachute combination after the parachute had fully opened.
3. It was concluded that:
 - a. The subject parachute on Drop Nos. 1, 2, and 4 failed to withstand the opening shock.
 - b. Drop No. 3 was satisfactory, withstanding a launching speed of 350 knots, indicated.
 - c. The terminal velocity of Drop No. 3 was 246 ft/sec.

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Aircraft Drops of Parachute, XG-18B,
Assembled on Mine, Mk. 25 Mod. 1

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Aircraft Drops of Parachute, XG-18B,
Assembled on Mine, Mk. 25 Mod. 1

PART B

INTRODUCTION

1. AUTHORITY:

This test was directed by reference (a) under Task Assignment No. NPG-33-Re6b-311-1 authorized by reference (b).

2. REFERENCES:

- a. NOL restr ltr NP51/F43-1(1-338) Ser 3577 with TSS No. 6194 of 30 June 1950
- b. BUORD conf ltr NP9(Re6b) of 20 December 1949

3. BACKGROUND:

a. This test is a part of the mine program for aircraft carried mines dropped at high launching speeds. The purpose of the long range program is to design a parachute which will withstand the opening shock when launched at high speeds.

4. OBJECT OF TEST:

This test was conducted to determine:

- a. The approximate maximum launching velocity.
- b. Flight characteristics of the mine-parachute combination.
- c. Terminal velocity.

5. PERIOD OF TEST:

- | | |
|-------------------------------------|--------------|
| a. Date Project Letter | 30 June 1950 |
| b. Date Necessary Material Received | 6 July 1950 |
| c. Date Commenced Test | 31 July 1950 |
| d. Test Completed | 31 July 1950 |

6. REPRESENTATIVES PRESENT:

J. Kistle	Naval Ordnance Laboratory
G. Kellner	Naval Ordnance Laboratory

Aircraft Drops of Parachute, XG-18B,
Assembled on Mine, Mk. 25 Mod. 1

PART C

DETAILS OF TEST

7. DESCRIPTION OF ITEM UNDER TEST:

a. The Parachute, XG-18B, is similar to the Parachutes, XG-16A, XG-17A, XG-18A except that the XG-18B is larger, having a diameter of 100 inches. The parachute, XG-18B, is shown in Figure 1. The parachute is housed in a Parachute Pack, XH-6A, which is similar to the Parachute Pack, Mark 13, except that the XH-6A pack is larger.

b. Parachutes were assembled on inert loaded Mines, Mark 25 Mod. 1, by means of attachment bands.

8. DESCRIPTION OF TEST EQUIPMENT:

a. Mines were launched from an F7F-3 type aircraft.

b. Release and flight of the mines were photographed by Cine-theodolites and related equipment.

c. A Mitchell high speed camera with 17 inch lens was used to photograph release, flight and impact of each drop.

9. PROCEDURE:

a. Four Mines, Mk. 25 Mod. 1, assembled with Parachutes, XG-18B, were launched separately from an F7F-3 type aircraft in horizontal flight at the time of release. Indicated air speeds at release varied from 350 to 410 knots. Altitudes at release varied from 800 to 2000 feet.

b. Film from the Cine-theodolites was used to compute the terminal velocity. Film from the Mitchell camera was used to determine flight characteristics.

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10. RESULTS AND DISCUSSIONS:

a. Three of the four mine-parachute units failed to withstand the opening shock when launched at indicated air speeds of 410, 370 and 370 knots, respectively. Figures 2, 3, and 4 show damage to parachutes. Drop No. 3 withstood the opening shock and had good flight after the parachute opening. The launching speed was 350 knots, indicated.

b. Terminal velocities were not determined for Drop Nos. 1, 2, and 4 since the parachutes failed to withstand the opening shock and did not check the descent of the mine. Terminal velocity for Drop No. 3 was determined to be 246 ft./sec. with the chute fully opened.

c. Detailed data are included in Table I.

PART D

CONCLUSIONS

11. It is concluded that:

a. The subject parachute on Drop Nos. 1, 2, and 4 failed to withstand the opening shock.

b. Drop No. 3 was satisfactory, withstanding a launching speed of 350 knots, indicated.

c. The terminal velocity of Drop No. 3 was 246 ft./sec.

PART E

DISPOSITION OF MATERIAL

12. The parachutes and packs were recovered and returned to the Naval Ordnance Laboratory representative.

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Assembled on Mine, Mk. 25 Mod. 1

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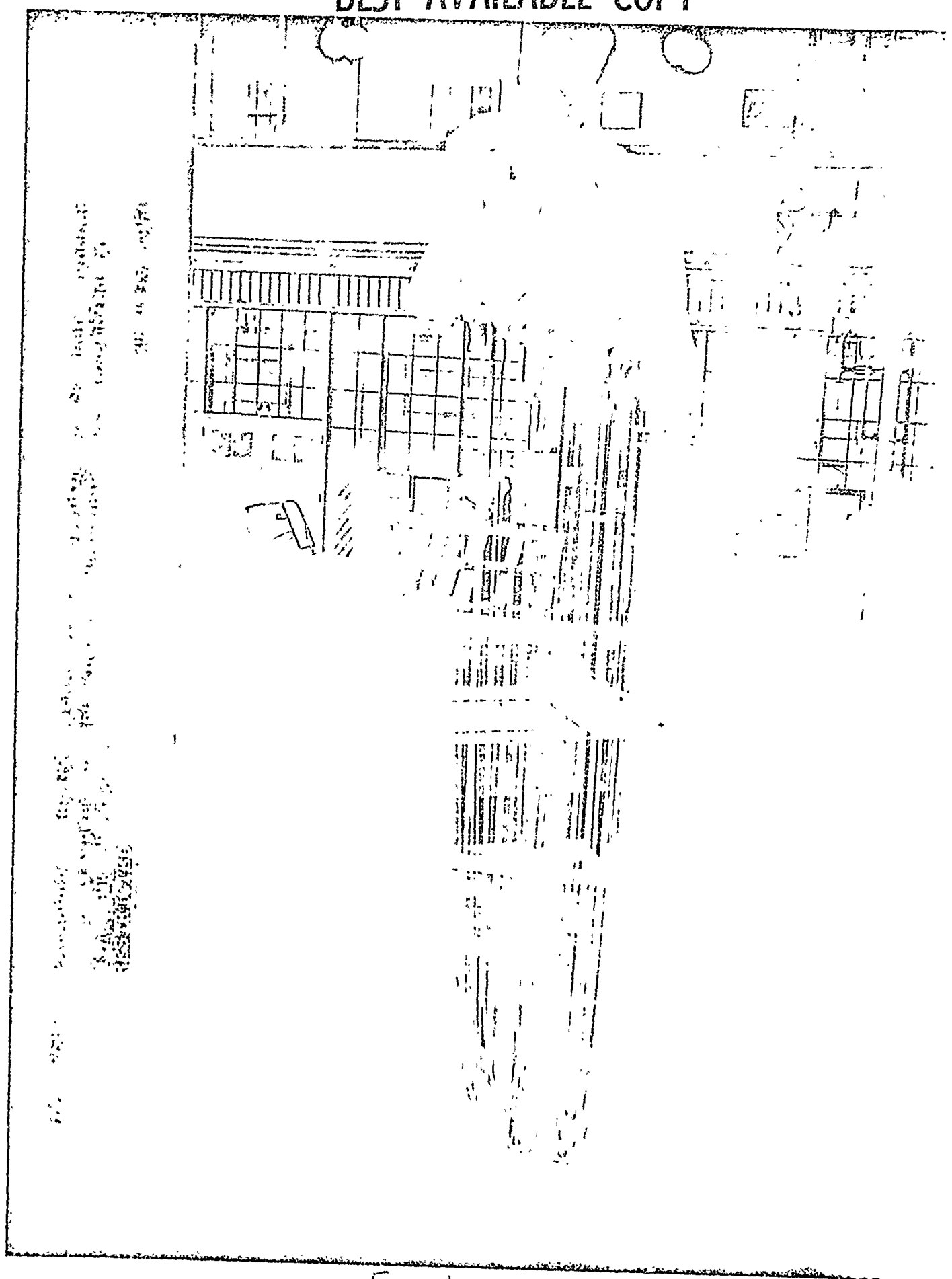


Figure 1

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2024-2025



Figure 3

Figure 4
A schematic diagram of the
structure of the
polymer chain
in the
crystalline
region.



Figure 4

Aircraft Drops of Parachute, XG-18B,
Assembled on Mine, Mk. 25 Mod. 1

TABLE I

Tabulated Test Data

Aircraft Drops of Parachute, XG-18B, Assembled on Mine,
Mk. 25 Mod. 1, launched from an F7F-3 type aircraft

<u>Drop No.</u>	<u>Date</u>	<u>Altitude at Release</u>	<u>Airspeed Knots Ind.</u>	<u>Terminal* Velocity ft/sec.</u>	<u>Remarks</u>
1	31 July 1950	1700	410	--	Chute torn immediately after opening. Descent of mine not checked.
2	"	1800	370	--	Same as Drop No. 1
3	"	1200	350	246	Chute opened and held good flight.
4	"	800	370	--	Same as #1, #2.

* Terminal velocity data on Drop Nos. 1, 2, and 4 were not reduced since the parachutes failed to function properly. The terminal velocity, based on observation of retardation of Drop No. 3 was 246 ft/sec, with a corresponding retardation ballistic coefficient, C_{ret} , of .0895.

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Assembled on Mine, Mk. 25 Mod. 1

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