AD NUMBER
AD007646
CLASSIFICATION CHANGES
TO: unclassified
FROM: confidential
LIMITATION CHANGES
TO: Approved for public release, distribution unlimited
FROM: Distribution authorized to DoD only; Test and Evaluation; MAR 1952. Other requests shall be referred to Naval Proving Ground, Dahlgren VA.
AUTHORITY
31 Mar 1964, DoDD 5200.10; USNSWC ltr dtd 7 Jul 1975

AD-

7646

CONFIDENTIAL

Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of

PART A

SYNOPSIS

1. The "Dove" is an air-to-ground missile with short wings, having no self propulsion. It is approximately 24 inches in diameter by 5 feet in length, with air scoops in the nose and stabilizing fins on the tail section to control the flight. The Naval Ordnance Laboratory is developing the tail fuzing system for the warhead.

2. The object of these preliminary tests was to devise a satisfactory method of conducting plate impact tests of the XB-44A fuze when fired in simulated missiles from the Naval Proving Ground's 500 foot rocket launcher.

3. It was concluded that:

a. Satisfactory terminal velocities and impact conditions can be obtained by the use of rocket motors to propel the XB-44A fuze from the Naval Proving Ground's 500 foot launcher while it is installed in a 250 lb. G.P. bomb AN-M57-A1.

b. The XB-44A fuze, as tested during this program, did not function as a result of shock or vibration while in motion on the launcher and therefore was considered "launcher safe".

c. One-half inch STS plate appeared to provide the minimum retardation which would cause the XB-44A fuzes to function when tested under the impact conditions of this program. Of the seven fuzes tested:

(1) Only two functioned in flight with a 250 ft. delay

(2) One functioned after a heavy secondary impact

(3) Two functioned in the recovery sandpile

(4) Two did not function.

d. The propulsion carriage can be separated from the bomb before target impact by the use of a 3V25 motor Mk 7 secured in the carriage to function as a "retro-motor", if a minimum of 150 ft. is provided between the launcher muzzle and target.

Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of

PART B

INTRODUCTION

1. AUTHORITY:

Reference (a) authorized the Naval Proving Ground to perform such tests of the tail fuzing system for the XSAM-N-4, Guided Missile Dove, as might be requested by the Naval Ordnance Laboratory. Reference (b) established Task Assignment NPG-04-Re2b-33, later superseded by Reference (e) Task Assignment NPG-Re2b-34-1-52, to provide the necessary funds. References (c) and (d) outlined the test requirements.

2. REFERENCES:

a. BUORD ltr NP9(Re2b-286 2)FLY:ss of 4 Apr 1949
b. BUORD ltr NP30(Re2b)JWG:ss of 25 May 1950
c. NOL ltr NP51/S71-8(3-615)TF:HLD Ser 01641 of 19 Dec 1950
d. NOL ltr NP/NOL/X1-1(497)TF:HLD Ser 0802 of 4 May 1951
e. BUORD Conf ltr NP9 Re2b-DB LaP:bjn Ser 23946 of 4 Aug 1951

3. BACKGROUND:

The "Dove" is an air-to-ground missile with short wings, having no self propulsion. It is approximately 24 inches in diameter by 5 feet in length, with air scoops in the nose and stabilizing fins on the tail section to control the flight. The Naval Ordnance Laboratory is developing the tail fuzing system for the warhead.

4. OBJECT OF TEST:

The object of these preliminary tests was to devise a satisfactory method of conducting plate impact tests of the XB-44A fuze when fired in simulated missiles from the Naval Proving Ground's 500 ft. rocket launcher.

5. PERIOD OF TEST:

a.	Date Project Letter	4 May 1951
b.	Date Necessary Material Received	25 April 1951
c.	Date Commenced Test	10 May 1951
d.	Test Completed	29 May 1951

6. REPRESENTATIVES PRESENT:

H. L. Davis	Naval Ordnance Laboratory
R. Happick	Naval Ordnance Laboratory

PART C

DETAILS OF TEST

7. DESCRIPTION OF ITEM UNDER TEST:

a. The XB-44A construction and overall appearance is shown in Figures 1 and 2. It is a vane arming fuze with dual primers detonated upon impact by means of firing pins. A delay train provides for functioning after penetration of the target.

8. DESCRIPTION OF TEST EQUIPMENT:

Test Vehicles:	Modified 250# G.P. Bombs AN-M57-A1 inert loaded
Launcher:	Naval Proving Ground's 500 ft.
Target:	1/2" STS plate
Propulsion:	Three 5"0 HVAR motors in carriage
Fuze Arming:	100# compressed air supply
Cameras:	Bowen and Mitchell, operated at 90 and 100 frames/sec. respectively.

9. PROCEDURE:

a. All fuzes were tested in modified 250# G.P. bombs. The fuzes were inserted in the tails of the bombs and protected by a heavy steel tube threaded to the bomb. A 1" x 2" hole was cut through the tube opposite the arming vane of the fuze to permit the insertion of an air hose used for remote arming prior to firing. Propulsion of the bombs was accomplished by the use of three 5"0 HVAR motors assembled in a special carriage as shown in Figure 3, and ignited simultaneously. Fuze functioning was indicated by the ignition of a cross axial, 350 gm. black powder smoke

puff in a tube 8-1/2" long by 1" diameter, situated immediately forward of the fuze booster. The 1/2" STS target plates were set up 50 ft. from the muzzle of the launcher on initial rounds and 15 ft. on later shots.

b. The arming vane was secured to the fuze arming shaft at the launching site by means of a special coupling. After assembling the three 5"0 HVAR motors in their carriage the propulsion vehicle and bomb were placed in the launcher, in contact with each other. The smoke puff tube was inserted in the bomb and taped in place. A 1" diameter air hose, leading from a gasoline powered, field type compressor (capable of supplying 100 lb./sq.in. air pressure), was inserted in the slot in the protective tube enclosing the arming vane. A 50 lb./sq.in. stream of air, controlled from a remote location, was then directed against the vane while all personnel were under shelter. Before firing the arming stem was checked to see that it had withdrawn sufficiently to permit arming. A Bowen camera and two Mitchell cameras were used to record the flight of the round. Velocities were measured during the last 20 ft. of travel on the launcher. Rounds were recovered in a large sandpile.

10. RESULTS AND DISCUSSION:

a. Appendix (A) contains detailed records of the plate impacts. Appendix (B), Figure 4, is an excerpt from the Bowen films taken of round 7. Following is a brief summary of the results obtained - all rounds fired against 1/2" STS plate at 0° obliquity:

Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of

Rd. No.	Date	Impact No.	Impact Velocity ft./sec.	Fuze No.	Remarks	Results
1	5-10-51	39028	888	117	Questionable whether fuze was fully armed when round was fired.	No evidence of functioning in flight-when recovered fuze had functioned-smoke puff fired.
2	5-14-51	38991	883	118		"
3	5-16-51	38993	859	119	Target 15° from muzzle starting with this shot-50° on first two rounds.	No evidence of functioning in flight. Some black powder still in tube when recovered, no evidence of functioning.
4	5-16-51	38994	903	120		No evidence of functioning in flight. All black powder still in tube when recovered.
5	5-21-51	39020	643	121	Only two motors fired.	No functioning in flight-after going through target round glanced off wedge in butt with fuze functioning about 60 ft. behind butt.
6	5-21-51	39021	893	122		Fuze functioned approx. 250 ft. behind target.
7	5-22-51	39022	916	123		Fuze functioned approx. 245 ft. behind target.

b. (1) While the propulsion method described above was satisfactory for the purpose of this test (it provided a combination of low acceleration and high striking velocity) it had one undesirable feature as far as future test programs were concerned. The propulsion motors remained in contact with the bomb all the way to the target. The sensitivity of the fuze upon impact, when installed in a 250 lb. G.P. bomb, was therefore an unknown quantity since the entire mass of the propulsion vehicle was helping to force the bomb through the target. Even though the bomb is not the ultimate vehicle for this fuze, it is obviously desirable to have the propulsion carriage separated from the bomb before impact to prevent damage to the fuze.

(2) Several separation methods were considered but the use of a retro-motor in the carriage appeared to be the quickest solution, involving a minimum of test firing. A 3"25 motor Mk 7 was installed in the upper part of the carriage directed oppositely to the three 5"0 motors. A set of contacts was provided to ignite the 3"25 motor 100 feet before reaching the muzzle of the launcher. Effective separation of the bomb and propulsion carriage in flight, Figure 5, approximately 150 ft. beyond the muzzle of the launcher, was thus obtained.

(3) The 5"0 HVAR motors used for propulsion (the only type available that would produce the desired striking velocity) burn for approximately 700 ft. The only launcher which will accommodate a 250 lb. G.P. bomb at the Naval Proving Ground is 500 ft. in length. Consequently the motors still have a considerable amount of thrust at the muzzle of the launcher and can not be effectively separated from the bomb for some distance beyond this point--a minimum of 150 ft. Erection of a target 150 ft., or further, beyond the muzzle precludes the possibility of bomb recovery when sufficient range for observation of fuze functioning is allowed behind the target, due to the short distance between the launcher and the edge of the river (550 ft.). The 1/4 second fuze delay after plate impact will result in functioning almost at the edge of the river and allow no room for a recovery sandpile. Therefore in future tests it will be necessary to sacrifice either the recovery of the bomb or the separation of the bomb and propulsion carriage.

PART D

CONCLUSIONS

11. It was concluded that:

a. Satisfactory terminal velocities and impact conditions can be obtained by the use of rocket motors to propel the XB-44A fuze from the Naval Proving Ground's 500 ft. launcher while it is installed in a 250 lb. G.P. bomb AN-M57-A1.

b. The XB-44A fuze, as tested during this program, did not function as a result of shock or vibration while in motion on the launcher and therefore was considered "launcher safe".

c. One-half inch STS plate appeared to provide the minimum retardation which would cause the XB-44A fuzes to function when tested under the impact conditions of this program. Of the seven fuzes tested:

(1) Only two functioned in flight with a 250 ft. delay

(2) One functioned after a heavy secondary impact

(3) Two functioned in the recovery sandpile

(4) Two did not function

d. The propulsion carriage can be separated from the bomb before target impact by the use of a 3U25 motor Mk 7 secured in the carriage to function as a "retro-motor", if a minimum of 150 ft. is provided between the launcher muzzle and target.

Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of

The tests upon which this report is based were conducted by:
F. W. KASDORF, Firing Director, Rocket Battery,
Terminal Ballistics Department

This report was prepared by:
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Terminal Ballistics Department

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Terminal Ballistics Department
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APPROVED: IRVING T. DUKE
Rear Admiral, USN
Commander, Naval Proving Ground

C. T. MAURO
Captain, USN
Ordnance Officer
By direction

CONFIDENTIAL

NPG REPORT NO. 933

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

Fifth Partial Report

on

Combat Air Operations Guided Missile Fuzes;

Research, Development, Tests and Reports of

- -

Second Partial Report

on

Fuzing System for XSAM-N-4,

Guided Missile Dove; Testing of

Project No.: NPG-Re2b-34-1-52
Copy No.: 21
No. of Pages: 9

Date:

MAR 20 1952

CONFIDENTIAL
SECURITY INFORMATION

NAVORD FORM 1883 (Nov 5)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 3902
IMPACT DATE 10 May 1951
NPG TEST NO CORE [redacted]

OBJECT SENSITIVITY TEST OF XB.44A FUZE IN 258 LB. G.P. BOMB WITH SMOKE PUFF LOADING

Reference: NPG ~~Ref~~: Pursuit No. 933 dated
Reference: BuOrd ltr. NP9 (Re2b-286-2) ELY dated 4 APR. 1949
Task Assignment No. NPG-Re2b-34-1-52 dated 4 AUG. 1951

PLATE TARGET

Gage 0.50 Class STS
Maker CARNEGIE
No. - Group -
Dimensions -

OBLIQUITY 0°

PENETRATION COMPLETE
Thickness at impact
No. of impact on plate
Dist. from nearest impact
Dist. from near edges and
Impact area
Spall: Front Back
Dish Spur
Cracks
Punching (thrown) (started)
Back Button (thrown) (started)
Bulge
Through opening

G. P. Bomb ROCKET

HEAD: Cal. Type G.P. Bomb A
Mark - Mod - No. - Wt. 258.95#
Maker DAL
Lot No. -
Filler: Type VERM. Wt.
Fuzes + .93 SMOKE PUFF
XB.44A FUZE # 117
Boosters
Wt. of head (as fired) 258.95#

MOTOR: Cal. 5" Mk. 2 Mod 3
Motor temp. 90° WT. 98.60#

COMPLETE ROUND: Mark Mod
Wt. (as fired) 331.55#
Wt. (burned)

OTHER INFORMATION MOTORS (3)
GRAIN: MK 18-0
GUN: RMOA-230-H HS
LAUNCHER 1050' Rocket Launcher

ROCKET PERFORMANCE

Flight Velocity, f/s: MEAN 488 Residual
Fuze functioning IN SANDPILE
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate
Condition of recovered round Satisfactory
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS:

Photo No.

Signed F. W. Kasdorf
F. W. KASDORF, Lt
ORD. ENG. 6-5-12

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APPENDIX A
Page No. 1

NAVORD FORM 1883 (Nov 3/48)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 39991

IMPACT DATE [redacted]

NPG TEST NO. [redacted]

OBJECT LAUNCHER SENSITIVITY TEST OF XP-44A FUZE IN [redacted] G.P. BOMB INERT LOADED EXCEPT FOR B.[redacted]. SMOKE PUFF

Reference: NPG ~~ltr~~. Report No. 933 dated

Reference: BuOrd ltr. NP9(R-22-2B-2)FLY dated 4 APR 1949

Task Assignment No. NPG-Re22-34-1-52 dated 4 AUG 1951

PLATE TARGET

Gage 0.50 Class STS
Maker
No. Group
Dimensions

OBLIQUITY

PENETRATION
Thickness at impact
No. of impact on plate
Dist. from nearest impact
Dist. from near edges and
Impact area
Spall: Front Back
Dish Spur
Cracks
Punching (thrown) (started)
Back Button (thrown) (started)
Bulge
Through opening

G.P. Bomb ROCKET

HEAD: Cal. Type G.P. Bomb
Mark — Mod — No. — Wt. 356.95#
Maker NOL
Lot No. —
Filler: Type [redacted]
Fuzes [redacted]
XP-44A No. 18
Boosters
Wt. of head (as fired) 356.95#

MOTOR: Cal. 5" Mk. 2 Mod 3
Motor temp. 90° WT. 98.20#

COMPLETE ROUND: Mark Mod
Wt. (as fired) 336.15#
Wt. (burned)

OTHER INFORMATION MOTORS (3)
GRAIN: MK 18.0
FIN: [redacted]
LAUNCHER 10.50" ROCKET [redacted]

ROCKET PERFORMANCE

Flight Velocity, f/s: ~~Striking~~ Mean 983 Residual
Fuze functioning IN SAND PILE
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate
Condition of recovered round
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS:

Photo No.

Signed F.W. Kaudorf
~~F.W. RADDORF~~, Lt
OrdEng. USN

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Page No. 2

NAVORD FORM 1883 (Nov 3/45)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 38993

IMPACT DATE 5-16-51

NPG TEST NO. _____

OBJECT Ballistic Test of XB-HA Fuze in 250# Inert Loaded Bombs vs 1/2" STS Plate at 0° obl.

Reference: NPG ~~Ltr~~. Report No. 933 dated _____
Reference: BuOrd ltr. NPG(Re2b-286-2)FL4 dated 4 APR 1949
Task Assignment No. NPG-Re2b-34-1-52 dated 4 AUG 1951

PLATE TARGET

Gage 1/2" Class STS
Maker —
No. — Group —
Dimensions —

OBLIQUITY 0°

PENETRATION Complete
Thickness at impact(s)
No. of impact on plate
Dist. from nearest impact
Dist. from near edges ___ and ___
Impact area
Spall: Front ___ Back ___
Dish ___ Spur ___
Cracks No
Punching (thrown) (started)
Back Button (thrown) (started)
Bulge
Through opening

G. P. Bomb ~~ROCKET~~

HEAD: Cal. ___ Type G.P. Bomb
Mark - Mod - No. - Wt. 258.75#
Maker NOL
Lot No. —
Filler: Type Verbic Wax Wt. ___
Fuzes .75 Smoke Puff
XB-HA No. 119
Boosters
Wt. of head (as fired) 258.75#

MOTOR: Cal. 5" Mk. 2 Mod 3
Motor temp. 70° Wt. 78.3#

COMPLETE ROUND: Mark ___ Mod ___
Wt. (as fired) 337.25#
Wt. (burned)

OTHER INFORMATION Motors (3)
Grain: MK 18-0
Bkn: ROOH-230-A-45
LAUNCHER 1050' Rocket Launcher

ROCKET PERFORMANCE

Flight ___ Velocity, f/s: ~~Striking~~ Mean 859 Residual ___
Fuze functioning NONE
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate
Condition of recovered round
Head was in (EFFECTIVE) ~~(INEFFECTIVE)~~ condition.

REMARKS:

Photo No. _____

Signed F. W. Kasdorf
F. W. KASDORF
Gio Engr GS-12

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Page No. 3

NAVORD FORM 1883 (Nov 3, 48)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 38994

IMPACT DATE 5-16-51

NPG TEST NO. _____

OBJECT Ballistic Test of XB44A Fuze in 250# Inert Loaded Bombs vs 1/2" STS Plate at 0° obl

Reference: NPG ~~Ltr~~. Report No. 939 dated _____
Reference: BuOrd ltr. NP9(Re2b-28b-2)FL4 dated 4 APR. 1949
Task Assignment No. NPG-Re2b-34-1-52 dated 4 AUG. 1951

PLATE TARGET

Gage 1/2" Class STS
Maker —
No. _____ Group _____
Dimensions _____

OBLIQUITY 0°

PENETRATION Complete
Thickness at impact _____
No. of impact on plate _____
Dist. from nearest impact _____
Dist. from near edges _____ and _____
Impact area _____
Spall: Front ~~Back~~ No measurements
Dish _____ Spur _____
Cracks _____
Punching (thrown) (started)
Back Button (thrown) (started)
Bulge _____
Through opening _____

G.P. Bomb ROCKET

HEAD: Cal. _____ Type G.P. Bomb
Mark — Mod — No. — Wt. 261.95#
Maker NOL
Lot No. —
Filler: Type ~~Vermiculite~~ Wt. _____
Fuzes 1.95 Smoke Puff
XB-44A No. 120
Boosters _____
Wt. of head (as fired) 261.95#

MOTOR: Cal. 5" Mk. 2 Mod 3
Motor temp. 70° Wt. 79.40#

COMPLETE ROUND: Mark _____ Mod _____
Wt. (as fired) 341.35#
Wt. (burned) _____

OTHER INFORMATION Pictures (3)
Grain: MK18-0
ALN: KMDA-230-H-45
LAUNCHER 10.50 Rocket Launcher

ROCKET PERFORMANCE

Flight _____ Velocity, f/s: ~~Striking~~ Mean 903 Residual _____
Fuze functioning None
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate _____
Condition of recovered round _____
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition

REMARKS: _____

Photo No. _____

Signed F.W. Kasdorf
F.W. KASDORF
ORD ENG GS-12

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APPENDIX A
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NAVORD FORM 1883 (Nov 3/48)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 39020

IMPACT DATE 21 MAY 1951

NPG TEST NO. CODE 10687

OBJECT LAUNCHER SENSITIVITY TEST OF XB-44 FUZE IN 250 LB. G.P. BOMB

Reference: NPG ~~ltr~~. Report No. 933 dated

Reference: BuOrd ltr. NP(Re2b-286-2) FL4 dated 4 APR 1947

Task Assignment No. NPG-Re2b-34-1-52 dated 4 AUG 1951

PLATE TARGET — G.P. BOMB — ROCKET

Gage 6.50" Class STS
Maker CARNEGIE
No. — Group —
Dimensions —

OBLIQUITY 0°

PENETRATION COMPLETE
Thickness at impact
No. of impact on plate
Dist. from nearest impact
Dist. from near edges and
Impact area
Spall: Front Back
Dish Spur
Cracks
Punching (thrown) (started)
Back Button (thrown) (started)
Bulge
Through opening

HEAD: Cal. Type G.P. Bomb
Mark AN M57 Mod A1 No. - Wt. 258.0#
Maker —
Lot No. —
Filler: Type INERT Wt.
Fuzes XB-44 FUZE #121
Boosters
Wt. of head (as fired) 258.0#

MOTOR: Cal. 5" Mk. 2 Mod 3
Motor temp. 90° Wt. 79.10#

COMPLETE ROUND: Mark Mod
Wt. (as fired) 337.1 0#
Wt. (burned)

OTHER INFORMATION MOTORS (3)
ALN: R7110A-230-H.45
GRAIN: MK 18-0
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight Velocity, f/s: Striking Mean 643 Residual
Fuze functioning ON SECONDARY IMPACT - HIT HEAVY WEDGE IN BUTT
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate
Condition of recovered round
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS:

Photo No.

Signed F.W. Krasdorf
F.W. KRASDORF, Lt.
ORD. EDE, ES-12

Confidential Security Information

APPENDIX A

NAVORD FORM 1883 (Nov 3/45)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 39021

IMPACT DATE 21 MAY 1951

NPG TEST NO. CODE 10687

OBJECT LAUNCHER SENSITIVITY TEST OF XB-44 FUZE IN 250 LB. G.P. BOMB

Reference: NPG ~~115~~. Report No. 933 dated

Reference: BuOrd ltr. NPG(Re2b-284-2)FLY dated 4 APR 1949

Task Assignment No. NPG-Re2b-34-1-52 dated 4 AUG 1951

PLATE TARGET — G.P. BOMB — ROCKET

Gage 6"50 Class STS
Maker CARNEGIE
No. — Group —
Dimensions —

OBLIQUITY 0°

PENETRATION COMPLETE
Thickness at impact
No. of impact on plate
Dist. from nearest impact
Dist. from near edge 3 and
Impact area
Spall: From FRAGMENTS Back
Dish PLUG Spur
Crack NONE
Punching (thrown) (started)
Back Button (thrown) (started)
Bulge
Through opening

HEAD: Cal. Type G.P. BOMB
Mark BNM57 Mod A1 No. — Wt. 251.00#
Maker —
Lot No. —
Filler: Type INERT Wt.
Fuzes
XB-44 FUZE #122
Boosters
Wt. of head (as fired) 251.00#

MOTOR: Cal. 5" Mk. 1 Mod 2
Motor temp. 90° WT. 79.55#

COMPLETE ROUND: Mark Mod
Wt. (as fired) 330.55#
Wt. (burned)

OTHER INFORMATION MOTORS (3)
ALN: RMOA-230-H-45
GRAIN: MK 18-0
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight Velocity, f/s: ~~Striking~~ MEAN 893 Residual
Fuze functioning 250 FT BEHIND TARGET
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate
Condition of recovered round
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS:

Photo No.

Signed F. W. Kasdorf
F. W. KASDORF, Lt
ORD. ENG. GS-12

Confidential Security Information

APPENDIX A

NAVORD FORM 1883 (Nov 3/48)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 39022

IMPACT DATE 22 May 1951

NPG TEST NO. CODE 10687

OBJECT LAUNCHER SENSITIVITY TEST OF XB-44 FUZE IN 250 LB. G.P. BOMB INERT LOADED

Reference: NPG ~~ltr~~. Report No. 933 dated

Reference: BuOrd ltr. NPG(Re2b-22L-2)FL4 dated 4 APR. 1949

Task Assignment No. NPG-Re2b-34-1-52 dated 4 AUG. 1951

PLATE TARGET — G.P. BOMB — ROCKET

Gage 0.50 Class STS
Maker CARNEGIE
No. - Group
Dimensions

OBLIQUITY 0°

PENETRATION COMPLETE
Thickness at impact
No. of impact on plate
Dist. from nearest impact
Dist. from near edges ~~7~~ and
Impact area
Spall: ~~Front~~ Back
Dish Spur
Cracks
Punching (thrown) (started)
Back Button (thrown) (started)
Bulge
Through opening

HEAD: Cal. Type G.P. BOMB
Mark AN-M57 Mod A1 No. - Wt. 255.0#
Maker
Lot No. -
Filler: Type INERT Wt. -
Fuzes
XB-44 FUZE # 123
Boosters
Wt. of head (as fired) 255.0#

MOTOR: Cal. 5" Mk. 2 Mod 3
Motor temp. 90° WT. 79.85#

COMPLETE ROUND: Mark Mod
Wt. (as fired) 334.85#
Wt. (burned)

OTHER INFORMATION
BLK: PMC 230-H45
GRAIN: MK 18-0
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight Velocity, f/s: Striking 916 Residual
Fuze functioning 245 FT. BEHIND TARGET
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate
Condition of recovered round
Head was in (EFFECTIVE) (~~INEFFECTIVE~~) condition.

REMARKS:

Photo No. NPG-47019

Signed F. W. Kasdorf
F. W. KASDORF, Lt
ORD. ENG. GS-12

Confidential Security Information

APPENDIX A

NAVORD FORM 1883 (New ?, ..)

IMPACT RECORD

U. S. NAVAL PROVING GROUND
DAHLGREN, VIRGINIA

IMPACT NO. 39047

IMPACT DATE 29 MAY 1951

NPG TEST NO. CODE 10690

OBJECT SEPARATION TEST OF ROCKET CARRIAGE AND 250 LB. G.P. INERT LOADED BOMB USING 3-5" MOTORS AND ONE 3"25 "RETRO" MOTOR

Reference: NPG ~~ltr.~~ dated

Reference: ~~NOLtr~~ ltr. NP/NOL/VI-1(234) WA/JSM Ser 0829 dated 11 May 1951

Task Assignment No. NPG-25-1 C 26-20 dated 15 Feb 1950

PLATE TARGET

Gage 0.959 Class STS
Maker LUKENS
No. 91 Group STS-L-2
Dimensions 85" X 348"

OBLIQUITY 0°

PENETRATION COMPLETE
Thickness at Impact
No. of impact on plate
Dist. from nearest impact
Dist. from near edges and
Impact area
Spall: Front FRAGMENTS Back
Dish PIECE Spur
Cracks
Punching ~~FRAGS~~ (thrown) (started)
~~Back~~ Button (thrown) (started)
Bulge
Through opening

ROCKET

HEAD: Cal. GP BOMB Type G.P. BOMB
Mark AN M57 Mod A1 No. Wt. —
Maker —
Lot No.
Filler: Type INERT Wt. —
Fuzes NONE
Boosters —
Wt. of head (as fired) 236.25

MOTOR: Cal. 5" Mk. 2 Mod 3
Motor temp. 90° WT. 79.05

COMPLETE ROUND: Mark Mod
Wt. (as fired)
Wt. (burned)

OTHER INFORMATION MOTORS (4)
5"0: ALK: RMDA-330-H45 GRAIN: MK 13
3"25: ALK: RMCD-400-MECH-45 " MK 13
LAUNCHER 1050' ROCKET LAUNCHER

ROCKET PERFORMANCE

Flight Velocity, f/s: ~~Striking~~ MEAN 939 Residual
Fuze functioning NO FUZE IN THIS BOMB
Explosive action (High Order) (Low Order) (None)
Distance of burst behind plate
Condition of recovered round
Head was in (EFFECTIVE) ~~(INEFFECTIVE)~~ condition.

REMARKS: SOME SEPARATION - BOMB HAD GOOD FLIGHT, MOTORS IN VERTICAL POSITION AT TARGET DUE TO OFF CENTER RETRO MOTOR

Photo No. NPG-47020

Signed F W. Kasdorf
E.W. KASDORF, Jr
ORD. ENG. GS-12.

Confidential
Security Information

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APPENDIX A

WARNING: THIS DOCUMENT AND THE SPECIAL DEVICE FEATURED OR CONSTITUTION DISCLOSED ARE U.S. NAVY PROPERTY. THE DISCLOSURE OF MATERIAL DEFENSE SECRETS IS A FEDAL OFFENSE PUNISHABLE BY A FINE, IMPRISONMENT, OR BOTH.

NPG-46987

ITEM	PART NO	PART NAME	QTY
1	A-139-001	BODY, MAIN	1
2	139-002	RING, FUZE	1
3	C-139-003	SHIELD, SAFE	1
4	A-139-004	SPRING, SAFETY, LOCK	1
5	B-139-005	CAP, DETONATOR CLOSING	1
6	A-139-006	PIN, SECRET	1
7	139-007	KEY ASSY., SECRET	1
8	C-139-008	SPRING, SECRET	1
9	A-139-009	RING, LOCKING	1
10	B-139-010	CAP, DETONATOR	1
11	A-139-011	PIN	1
12	A-139-012	RING, SAFETY, LOCK	1
13	139-013	RING, SAFETY, SEAL	1
14	A-139-014	ARM, REST 30	1
15	B-139-015	SPRING	1
16	A-139-016	CLUTCH	1
17	A-139-017	GEAR, SPUR, 30 TEETH	1
18	A-139-018	GEAR, SPUR, 60 TEETH	1
19	A-139-019	GEAR, SPUR, 90 TEETH	1

Fig. 4-4 Multiple 500 lb. Rocket Launcher.

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SECURITY INFORMATION

NP9-46089
Test vehicle for AB-44A fuze. Fired from NPG 500 ft. Launcher in 250# G. P. inert loaded bomb. Fuze functioning indicated by cross axial smoke puff in tail of bomb. Compressed air used to prearm fuze. Three 5"0 rocket motors Mk 2 used for propulsion.

Figure 3

NP9-47019
Functioning test of [illegible]B-44A fuze. Fired from NPG 500 ft. Launcher with/t ree 5"0 [illegible]VAR motors for propulsion vs 1/2" STS plate at 0° obliquity 15 feet from muzzle of launcher.

(over please)

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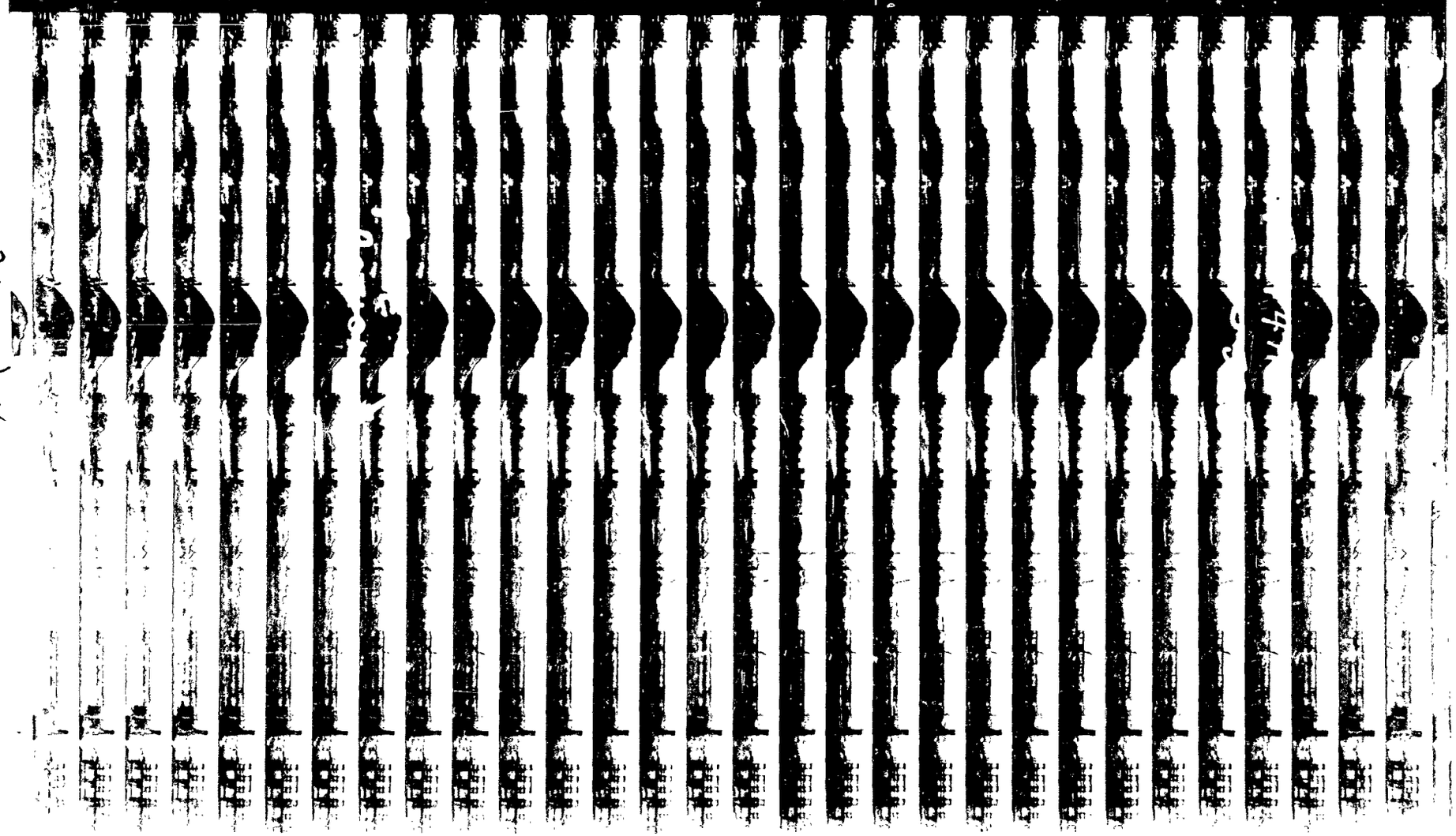

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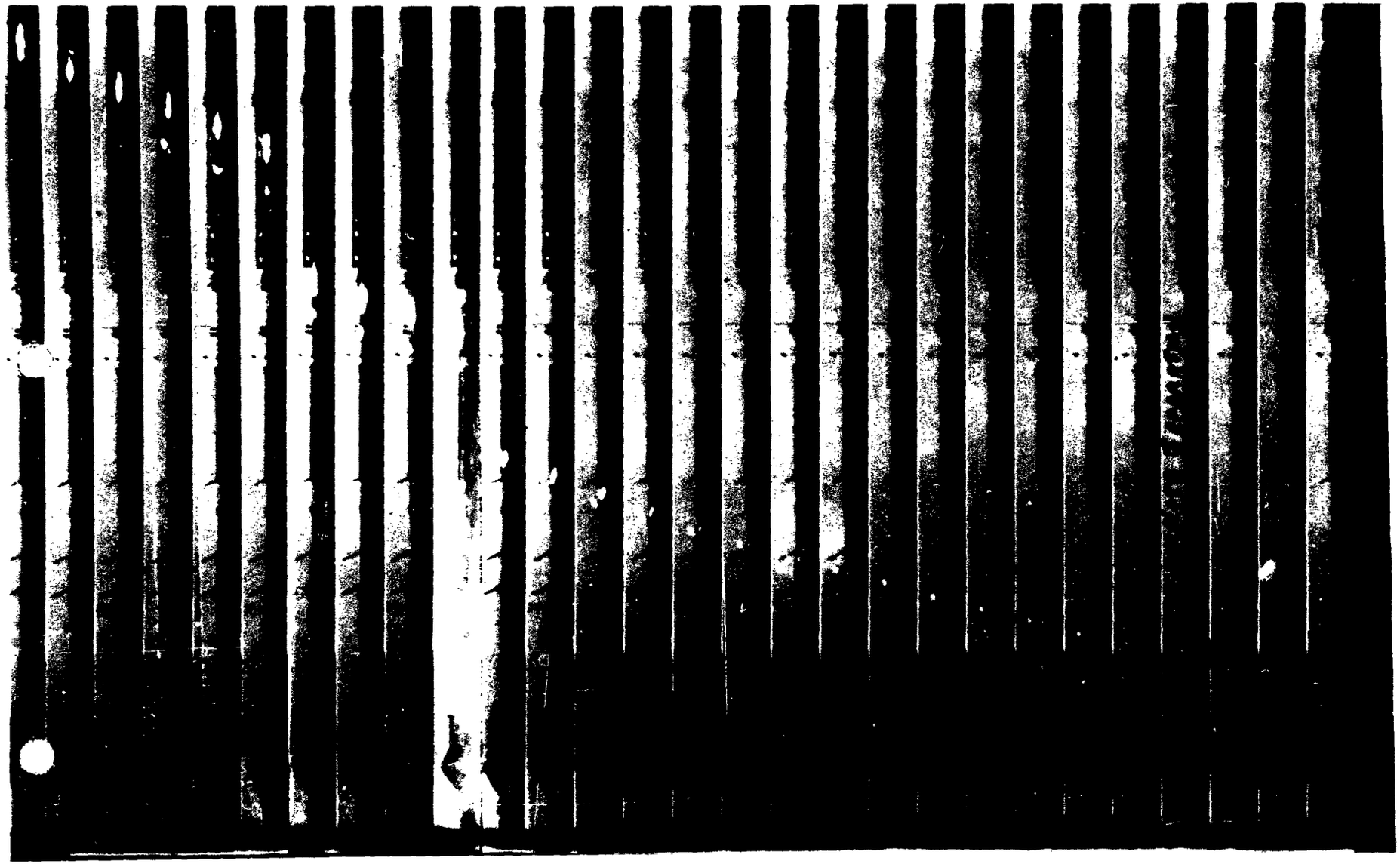

Fuzing System for XSAM-N-4, Guided Missile Dove; Testing of

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