



**US Army Corps
of Engineers**

St. Louis District®

FOCUSED ARCHIVE SEARCH REPORT

for

NASA – WFF

TEST CELL

(aka Gun Laboratory Range Area)

Accomack County, Virginia

November 2005

Prepared by
U.S. Army Corps of Engineers
ST. LOUIS DISTRICT

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1 SUBJECT AND SCOPE

The subject of this focused Archive Search Report (ASR) is the former Naval Aviation Ordnance Test Station (NAOTS) **Test Cell** (also known as the **Gun Laboratory Range Area**) located east of the Wallops Main Base and immediately south of the Boat Basin. The Test Cell/Gun Laboratory Range Area included a production test range, an experimental range, a separate firing-in butt for each range, a ready service magazine, and the necessary operations and stowage spaces. The Test Cell/Gun Laboratory Range Area was used for the ground firing test and evaluation of experimental aircraft guns and mechanisms and for the proof testing of production lots of aircraft 20-millimeter (mm) ammunition. The Test Cell/Gun Laboratory Range Area is currently the site of the National Aeronautics and Space Administration-Wallops Flight Facility (NASA – WFF) Visitors Center.

This report addresses the tests and operations conducted at the Test Cell/Gun Laboratory Range Area and the weapons and ammunition used in these tests in order to determine the potential for residual ordnance and explosive hazards in the area. The period covered by this report commences in 1946 and continues through 1959.

This focused ASR is a follow-on report to the NASA – WFF ASR, October, 2005 and refers to information and drawings therein.

2 ISSUE AND OBJECTIVE

2.1 Issue

The issue addressed by this focused ASR is what types of ammunition were fired at the Test Cell/Gun Laboratory Range Area. If explosive ammunition were fired and fuzes tested, UXO hazards might be present on the grounds of the former Test Cell/Gun Laboratory Range Area.

2.2 Objective

The objective of this focused ASR is to resolve the above stated issue by identifying and documenting the types of ammunition fired at the Test Cell/Gun Laboratory Range Area.

3 DOCUMENTS SEARCH APPROACH

The Defense Technical Information Center (DTIC) was queried for those reports that had NAOTS Chincoteague as the Corporate Author and for those documents involving 20-mm and 30-mm ammunition or weapons tests at U.S. Navy installations. This resulted in the acquisition of 58 reports, 20 of which provided useful information. These reports are listed in Table 1.

A research trip to the National Archives and Records Administration (NARA) at College Park, MD was made to examine Naval Bureau of Ordnance records not previously examined. Approximately 109 boxes of records associated with record groups NA111 (Naval Auxiliary Air Station Chincoteague), NP57 (NAOTS, Chincoteague), and X (ammunition) were reviewed. The Record Groups, Entries, and Boxes searched are listed in Table 2. Classified documents were examined but not included in this report.

Hard copies of reviewed textual document and DTIC reports (excluding classified documents) are included in this ASR as Attachment 1.

4 FINDINGS OF FACT AND ANALYSIS

Findings of Fact obtained from the DTIC and NARA documents are presented in this section and annotated by footnotes. Where appropriate and possible, an analysis of each Finding of Fact follows the footnoted finding.

From 1946 through 1959, NAOTS operated two geographically separated firing areas: 1) the Gun Laboratory Range Area that had two firing ranges adjacent to the airfield (referred to as the Test Cell in the NASA-WFF ASR, October 2005) and 2) the Wallops Island Range and Test Facility that had a total of three firing ranges on Wallops Island (referred to as the Machine Gun and Rocket Firing Area and the Explosive Ammunition Test Center in the NASA – WFF ASR, October 2005).¹

4.1 Test Cell/Gun Laboratory Range Area

The Test Cell/Gun Laboratory Range Area included a Production Test Range, an Experimental Range, a ready service magazine, and the necessary operations and stowage spaces (Features C and D in the NASA-WFF ASR, June 2005; Plate No. 3-1). Each range fired into separate targets and firing-in butts.² The Test Cell/Gun Laboratory Range Area was used for ground firing tests and evaluations of experimental and production models of aircraft gun-type weapons, associated accessories, and non-explosive ammunition. Non-explosive aircraft ammunition includes training practice (T. P.) and inert solid shot, neither of which is loaded with explosives.

4.1.1 Production Test Range. NAOTS was also tasked with conducting ammunition lot proof testing. This involved firing a small number of rounds from a production lot to insure that the lot met military standards. Ammunition lot proof testing was conducted on the Production Test Range. This range consisted of three bulletproof single bays and two outside double gun mounts that were used for the production acceptance of feeders, non-explosive ammunition, aircraft guns, and associated accessories.³ Documents collected for this focused ASR do not indicate that fuzes were tested at the Production Test Range.

¹ U.S. Bureau of Ordnance, NAOTS Principal East Coast Aircraft Ordnance Test and Evaluation Activity, February 1956. (Reference W-41, Attachment 1)

² Ibid. (Reference W-41)

³ Ibid. (Reference W-41)

4.1.2 Experimental Range. The Experimental Range consisted of one bay that had three gun mounts and was used for testing experimental guns, feeders, ammunition, and components. In the report cited below, the description of this range refers to “ammunition”, not to non-explosive ammunition. However, the description for the Experimental Range’s parent facility, the Gun Laboratory Range Area, contained in the same cited report, states that the Gun Laboratory Range Area, which included both the Production Test Range and Experimental Range, was used to test non-explosive ammunition.⁴ Documents collected for this focused ASR do not indicate that fuzes were tested at the Experimental Range.

Another report on the test and evaluation of the T-22 Feed Mechanism for the 20-mm gun, conducted at the Test Cell/Gun Laboratory Range Area, indicates that 1,759 rounds of M21A1 practice (non-explosive) 20-mm ammunition were used.⁵ This report and others acquired through DTIC reporting on similar tests do not mention the use of high explosive ammunition or fuzes at the Test Cell/Gun Laboratory Range Area.

An early 1950 document refers to the subject area as the Test Cell and describes the facility as being utilized in the conduct of ground fire tests of aircraft machine guns and rocket projectors. Additionally, one section of the Test Cell, constructed of heavy reinforced concrete walls, was used for static testing of various types of jet engines used to power guided missiles and included a jet engine thrust stand.⁶

4.1.3 Magazines. Both non-explosive and explosive 20-mm ammunition were shipped to and stored in the Naval Auxiliary Air Station (NAAS)/NAOTS Chincoteague magazines during the subject years. A 1953 report shows that 20-mm explosive ammunition was stored with other explosive munitions in the airfield’s main magazine area. The report also shows that 20-mm T. P. (non-explosive) ammunition was stored separately in Building No. J-11.⁷ (Building No. J-11 was the Test Cell Magazine identified as Feature D in the NASA-WFF ASR, June 2005; Plate Nos. 5-3B, D, and F.)

4.2 Wallops Island Range and Test Facility

NAOTS Chincoteague was also tasked with conducting ammunition lot proof testing and ballistic testing of explosive ammunition.⁸ Explosive aircraft ammunition consisted of High Explosives (HE), High Explosives-Incendiary (HE-I), and Armor Piercing-Incendiary (AP-I) rounds. HE, HE-I, AP-I ammunition, and the fuzes for these rounds, contained explosive material.

⁴ Ibid. (Reference W-41)

⁵ U.S. NAOTS Chincoteague, Virginia, Task No. A-9-46, 21 February 1947. (Reference W-1)

⁶ Program, Inspection of Station Facilities, Chief of the Bureau of Ordnance, 10 March 1950. (Reference W-3)

⁷ Chief, Bureau of Ordnance, NAAS/NAOTS Chincoteague, Va., Ammunition Storage; evaluation of, 29 December 1953. (Reference W-2)

⁸ NAOTS Chincoteague, Annual Technical Progress Report, 1955, 6 March 1956. (Reference W-43)

The Wallops Island Range and Test Facility consisted of an Environmental Range, an Ammunition Test Facility, an Accuracy Range, two stowage magazines, a gun cleaning and stowage building, and a plate test target stand. The contiguous Environmental Range and Ammunition Test Facility were part of the Explosive Ammunition Test Center.⁹ (The Explosive Ammunition Test Center was identified as Feature No. 14 in the NASA-WFF ASR, June 2005; Plate No. 5-2G.)

4.2.1 Environmental Range. The Environmental Range consisted of a chamber where firing was conducted under artificially produced extremes in temperature and humidity.¹⁰

4.2.2 Ammunition test Facility. The Ammunition Test Facility consisted of two bulletproof double bays and two outside gun mounts. The Ammunition Test Facility was used for the production acceptance test of explosive ammunition, aircraft guns, and associated equipment.¹¹

4.2.3 Accuracy Range. The Accuracy Range was a self-contained unit, consisting of one enclosed double bay and two outside gun mounts, with a 2,250-foot (750-yard) firing range.¹² (This 750-yard range was identified as Feature No. 7, the Machine Gun and Rocket Firing Area, in the NASA-WFF ASR, June 2005; Plate No. 5-2B.)

5 CONCLUSIONS

5.1 Test Cell/Gun Laboratory Range Area

a. Experimental testing of aircraft gun-type weapons, associated accessories, and lot proof testing of non-explosive aircraft ammunition was performed at the Test Cell/Gun Laboratory Range Area. No document or report was found that indicated the use explosive HE, HE-I, or AP-I ammunition or fuzes at the subject Test Cell/Gun Laboratory Range Area.

b. By design and plan, explosive ammunition was not fired at the Test Cell/Gun Laboratory Range Area. The certainty of this conclusion is only minimally reduced by the fact that first-hand accounts were not available and only “snapshots” of the period during which testing was conducted at the Test Cell/Gun Laboratory Range Area are available from the collected documents.

c. UXO or explosion hazards are not expected to be present in the former Test Cell/Gun Laboratory Range Area. This conclusion is based on the fact that documents collected indicate that only non-explosive ammunition was tested at this facility. Conversely stated, no documents were found that indicate the use of explosive ammunition (including fuzes) at the Test Cell/Gun Laboratory Area.

⁹ U.S. Bureau of Ordnance, NAOTS Principal East Coast Aircraft Ordnance Test and Evaluation Establishment, February 1956. (Reference W-41)

¹⁰ Ibid. (Reference W-41)

¹¹ Ibid. (Reference W-41)

¹² Ibid. (Reference W-41)

5.2 Wallops Island Range and Test Facility

a. NAOTS Chincoteague conducted ammunition lot proof testing and ballistic testing of explosive HE, HE-I, and AP-I ammunition, and their fuzes, at Wallops Island. Tests involving explosive ammunition were conducted at the Environmental Range, the Ammunition Test Facility, and the Accuracy Range. The Environmental Range was used to test explosive ammunition in extreme environmental conditions. The Ammunition Test Facility was used for the production acceptance test of explosive ammunition, aircraft guns and associated equipment. Ballistic tests were conducted at the Accuracy Range.

b. By design and plan, the Wallops Island Range and Test Facility ranges were used by NAOTS to test explosive ammunition and their fuzes. Because explosive ammunition was tested at these three ranges, UXO hazards are expected to be present on Wallops Island in the vicinity of these ranges.

5.3 General Conclusions

a. Both non-explosive and explosive 20-mm ammunition was shipped to and stored in the NAAS/NAOTS Chincoteague magazines during the subject years. Specific information pertaining to the delivery of ammunition from the magazines to the areas of use was not available and/or not found. Accordingly, no definitive conclusions from a review of recovered ammunition shipment and storage records as to specific use and area of use can be made.

b. The Test Cell/Gun laboratory Range Area was used for ground fire tests of aircraft rocket projectors. Additionally, one section of this area included a jet engine thrust stand that was used to test various types of jet engines that powered guided missiles. These tests would not have involved the use of ordnance and explosives. However, the propellants and fuels used in the rocket projectors and jet engines could have contained other hazardous materials. This possibility will be researched and documented in Phase II of the NASA-WFF ASR.

TABLE 1 - FOCUSED ARCHIVE SEARCH RESULTS

The results of the NARA II College Park searches and DTIC acquisitions are listed below. The descriptions of many reports have been shortened for spacing. Reviewed classified reports are not listed.

NAOTS reports were numbered in accordance with a standard numbering system. A no-entry (or blank) space in the Report # column indicates that a report is known have existed but is not archived at NARA II or was not found by the ASR team. As an example, Reports #'s 27 and 29 were found by the ASR team and # 28 was either not at NARA II or not found by the ASR team.

Report #	Brief Description	Box #	Location
	Project 7-Re9e-3-19	865	631/28/44/4
	Project 18-Re8a-21-2 <i>Development Firing Test of 20mm Aircraft Gun EX-1(T55) T-2 (Prototype MK 9 Mod 0)</i>	865	631/28/44/4
	Project 18-Re8a-108-1	865	631/28/44/4
	Project 18-Re8a-108-2	865	631/28/44/4
	Project 18-Re8a-108-7	865	631/28/44/4
	Project 20-Re8b-114-1	865	631/28/44/4
	Project 20-Re8b-114-2	865	631/28/44/4
	Project 32-Re8c-108-1	865	631/28/44/4
	Project 32-Re8c-111-1	865	631/28/44/4
	Project 32-Re8c-112-1	865	631/28/44/4
	Project 32-Re8c-114-1 <i>Ground Test of Prototype Automatic Reloadable Aircraft Rocket Launcher for 5" GASR (MK 11 Mod 0)</i>	865	631/28/44/4
	Project 32-Re8d-99-1	865	631/28/44/4
	Project 32-Re8d-99-2	865	631/28/44/4
	Project Re8c-114-1-52	865	631/28/44/4
	Project Re9b-202-1-53	865	631/28/44/4
	Project Re9b-202-1-53	865	631/28/44/4
	Project A-9-46 <i>Test and Evaluation T-22 Feed Mechanism</i>	865	631/28/44/4
	Project A-22-8-54	865	631/28/44/4
	Project G-17-47	865	631/28/44/4
1			
2			
3			
4	Practice Bomb Signals	864	631/28/44/4

Report #	Brief Description	Box #	Location
5			
6			
7			
8			
9			
10			
11	1000 lb Bomb EX 10 Mod 10	864	631/28/44/4
12			
13	Practice Bomb Signals	864	631/28/44/4
14			
15			
16	Torpedo	864	631/28/44/4
17			
18			
19	Fire Bomb, MK 77 Mod 0	864	631/28/44/4
20	1000 lb Fire Bomb EX 14 Mod 0	864	631/28/44/4
21			
22	Equipment	864	631/28/44/4
23	Dove Missile	864	631/28/44/4
24	Dove Missile	864	631/28/44/4
25			
26	Petrel Tail Section	864	631/28/44/4
27	Fire Bomb, MK 78 Mod 0	864	631/28/44/4
28			
29	Dove Missile	864	631/28/44/4
30	Equipment	864	631/28/44/4
31			
32			
33	Night Drift Signal MK 5 Mod 4	864	631/28/44/4
34	Dove Missile	864	631/28/44/4
35	Dove Missile	864	631/28/44/4
36			
37	Dove Missile	864	631/28/44/4
38	Dove Missile	865	631/28/44/4
39	Dove Missile	865	631/28/44/4
40			
41	Dove Missile	865	631/28/44/4
42			
43	Night Drift Signal MK 5 Mod 4	865	631/28/44/4
44			
45	Petrel Missile	865	631/28/44/4
46	<i>Technical Report on Evaluation of Gunboat Point Wallops Island, Virginia</i>	865	631/28/44/4

Report #	Brief Description	Box #	Location
47	1000 lb Bomb EX 10 Mod 9	865	631/28/44/4
48			
49	Equipment	865	631/28/44/4
50			
51	Night Drift Signal MK 5 Mod 4	865	631/28/44/4
52	Aircraft Parachute Flares	865	631/28/44/4
53	Equipment	865	631/28/44/4
54	Dove Missile	865	631/28/44/4
55	1000 lb Bomb EX 10 Mod 15	865	631/28/44/4
56	Dove Missile	865	631/28/44/4
57			
58	Dove Missile	865	631/28/44/4
59			
60	Dove Missile	865	631/28/44/4
61			
62	Dove Missile	865	631/28/44/4
63	Dove Missile	865	631/28/44/4
64			
65	Dove Missile	865	631/28/44/4
66			
67			
68			
69			
70			
71	Dove Missile	23	631/25/34/1
72	Dove Missile	23	631/25/34/1
73	1000 lb Practice Bomb EX 16 Mod 0	23	631/25/34/1
74	Dove Missile	23	631/25/34/1
75	Dove Missile	23	631/25/34/1
76			
77			
78	Dove Missile	23	631/25/34/1
79			
80			
81	Dove Missile	23	631/25/34/1
82	Equipment	23	631/25/34/1
83			
84			
85	Night Drift Signal MK 5 Mod 4	23	631/25/34/1
86			
87			
88	Dove Missile	23	631/25/34/1
89			

Report #	Brief Description	Box #	Location
90	Equipment	23	631/25/34/1
91			
92			
93	Dove Missile	23	631/25/34/1
94	Dove Missile	23	631/25/34/1
95	250 lb Bomb EX2 Mod 2	23	631/25/34/1
96	Float Light MK 6 Mod 2	23	631/25/34/1
97			
98	Night Drift Signal MK 5 Mod 4	23	631/25/34/1
99			
100			
101			
102	Float Light MK 6 Mod 2	23	631/25/34/1
103	Dove Missile	23	631/25/34/1
104			
105			
106			
107			
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109			
110			
111			
112			
113			
114			
115	MK 4 Mod 4 Signal	23	631/25/34/1
116	2000 lb Bomb EX 11 Mod 1	23	631/25/34/1
117	Dove Missile	23	631/25/34/1
118	1000 lb Bomb AN-M65A1	23	631/25/34/1
119	Equipment	23	631/25/34/1
120			
121	Night Drift Signal MK 5 Mod 4	23	631/25/34/1
122			
123			
124	Parachute Flares	23	631/25/34/1
125			
126			
127	Dove Missile	23	631/25/34/1
128			
129			
130	500 lb Bomb EX 12 Mod 4	23	631/25/34/1
131			
132	Equipment	261	631/26/46/3

Report #	Brief Description	Box #	Location
133			
134			
135			
136			
137			
138	Petrel Missile	261	631/26/46/3
139			
140			
141	1000 lb Bomb EX 14 Mod 2 Assembly, Fit, Flight, and Drop Tests on EX 14 Mods 2 and 3, 1000-lb Low Drag Fire Bomb	261 DTIC	631/26/46/3 AD 058742
142			
143	Dove Missile	261	631/26/46/3
144			
145			
146			
147			
148	Fire Bomb Fuels	261	631/26/46/3
149			
150	Fuze Tests	261	631/26/46/3
151	Signal, MK 4 Mod 3	261	631/26/46/3
152			
153			
154			
155			
156			
157			
158			
159	Fuze Tests	261	631/26/46/3
160	Marker MK 7 Mod 2	261	631/26/46/3
161	Equipment Test and Evaluation of the Bomb Director Mark 8 Mod 0	261 DTIC	631/26/46/3 AD-067384
162			
163			
164			
165			
166			
167			
168			
169			
170			

Report #	Brief Description	Box #	Location
171	Dove Missile	261	631/26/46/3
172	1000 lb Bomb EX 16 Mod 1 <i>Fit, Filling, High-Speed Flight, and Drop Test of Bomb, Practice, 1000-lb, EX 16 Mod 1</i>	261 DTIC	631/26/46/3 AD-070348
173	Dove Missile	261	631/26/46/3
174			
175			
176	Equipment <i>Aircraft Fire Control System Mark 21</i>	261 DTIC	631/26/46/3 AD-075730
177	Dove Missile	261	631/26/46/3
1-56			
2-56			
3-56			
4-56			
5-56			
6-56			
7-56			
8-56			
9-56			
10-56			
11-56	<i>Ground and High-Speed Flight Test of Bomb, Practice, 56-lb, Type EX 27 Mod 1</i>	DTIC	AD-090236
12-56			
13-56			
14-56			
15-56			
16-56			
17-56	<i>Fit, Filling, High-Speed Flight, and Drop Tests of bomb, EX 28 Mods 0 and 1 (Practice 250-lb)</i>	DTIC	AD-092387
18-56			
19-56	<i>Captive Flight, Arming Time, and Fit Tests on the M172(T738) Bomb Tail Fuze with Field Fix and Factory Modifications</i>	DTIC	AD-099987
20-56	<i>Feasibility and Impact Area Comparison of VT Fuzed Fire Bomb, MK 77 Mod 0</i>	DTIC	AD-098376
21-56			
22-56			
23-56			
24-56			
25-56			
26-56			

Report #	Brief Description	Box #	Location
27-56			
28-56	<i>Infrared Fire Control Assembly AN/UAG-1 MK 1 Mod 0</i>	DTIC	AD-124521
29-56	<i>Aircraft Fire Control System MK 21, Director Mode of Operation in Air-to-Air Gunnery</i>	DTIC	AD-100675
30-56	<i>Evaluation of Fire Bomb Fuels Test 2</i>	DTIC	AD-100560
1-57			
2-57			
3-57			
4-57			
5-57			
6-57			
7-57			
8-57			
9-57			
10-57			
11-57			
12-57	<i>Ground and High-Speed Flight Test of Bomb, Practice, 25-lb, MK 76 Mod 3</i>	DTIC	AD-132297
13-57			
14-57			
15-57			
16-57			
17-57			
18-57	<i>Assembly, Fit, High-Speed Flight, and Drop Tests of Bomb MK 79 Mod 0 (Fire, 1000-lb)</i>	DTIC	AD-140147
1-58			
2-58			
3-58			
4-58			
5-58			
6-58			
7-58			
8-58			
9-58			
10-58			
11-58			
12-58			
13-58			
14-58			
15-58			

Report #	Brief Description	Box #	Location
16-58			
17-58			
18-58	<i>Infrared Air-to-Ground Scanner AN/AAS-4</i>	DTIC	AD-300053
19-58			
20-58			
21-58			
22-58			
23-58			
24-58			
25-58			
26-58			
27-58			
28-58			
29-58			
30-58			
31-58			
32-58	<i>Evaluation of the AAS-4 Infrared Sensor for Use as Night Viewfinder for Naval Reconnaissance Aircraft</i>	DTIC	AD-305057
1-59			
2-59	<i>Evaluation of AERO 1A Missile Dispenser (Lazy Dog)</i>	DTIC	AD-305579
3-59			
4-59	<i>Test and Evaluation of the AN/AAA-2 (XN-1) Receiver Group</i>	DTIC	AD-305497
5-59	<i>Flight Evaluation of the Rocket Firing Error Indicator</i>	DTIC	AD-211887
6-59	<i>Ground and High-Speed Flight Test of Bomb, Practice, 25-lb, MK 76 Mod 3 (Experimental)</i>	DTIC	AD-211886
7-59			
8-59			
9-59	<i>Air to Ground Infrared Survey Study</i>	DTIC	AD-212087

TABLE 2 - REVIEWED FILES

Entry 1021A Scientific and Technical Reports, 1946-1961
Boxes 1-1654
Location 631/25/33/01

Entry 1021B Scientific and Technical Reports, 1946-1961
Box 1
Location 631/9/42/01

Entry 1022 Technical Publications, 1902-1961
Boxes 1-2034
Location 631/33/24/03

Entry 1033 Scientific and Technical Reports, 1946-1961
Boxes 3-25
Location 631/32/45/02

Entry 1034 Scientific and Technical Reports, 1946-1961
Boxes 1-25
Location 631/32/46/03

Entry 1035 Scientific and Technical Reports, 1946-1961
Boxes 1-81
Location 631/32/47/04

Entry 25I Confidential Correspondence, 1942
Boxes 145-156

Entry 25M Confidential Correspondence, 1943
Box 188

Entry 25N Confidential Correspondence (Bulky Enclosures), 1940-1943
Box 26

Entry 25O Restricted Correspondence, 1943
Boxes 258-260, 347-354, 380-387, 455-461, 476, 520, 819

Entry 25U Confidential Correspondence, 1944
Boxes 507, 580

Entry 25V Restricted Correspondence, 1944
Boxes 300-302, 846, 1121

Entry 1001 Correspondence, 1907-1949

- Boxes 37, 40, 41, 60-62, 69, 76-79, 98, 99, 105, 114, 115
- Entry 1002A Construction and Procurement Files, 1945
Box 1455
- Entry 1002B Office of Construction and Procurement Subject Files, 1946
Boxes 238-241, 262, 263, 289, 354, 522-541, 560-583, 584-607, 608-615
- Entry 1002C Office of Construction and Procurement Subject Files, 1947
Boxes 195-197, 211, 269, 396-400, 417-426
- Entry 1003A General Correspondence Unclassified and Confidential, 1948-1959
Boxes 575-580, 639
- Entry 1003C General Correspondence Unclassified and Confidential, 1948-1959 (1948-1952)
Boxes 992-996, 1051, 1502-1506, 1567, 1568, 2070-2073, 2127
- Entry 1004 General Correspondence Unclassified and Confidential, 1948-1959
(Unclassified 1953)
Boxes 92, 102
- Entry 1005 General Correspondence Unclassified and Confidential, 1948-1959
(Confidential 1953)
Boxes 24, 29
- Entry 1006 General Correspondence Unclassified and Confidential, 1948-1959
(Unclassified 1954)
Boxes 92, 99
- Entry 1007 General Correspondence Unclassified and Confidential, 1948-1959
(Confidential 1954)
Boxes 32, 36
- Entry 1008 General Correspondence Unclassified and Confidential, 1948-1959
(Unclassified 1955)
Boxes 103-113, 121
Boxes 103, 104, 112, 113, 121
- Entry 1017 General Correspondence Secret, 1942-1959
Boxes 134-142, 413-421, 429, 941-945

ATTACHMENT 1 – REFERENCES

- W-1 U.S. Naval Aviation Ordnance Test Station.**
1947 Final Report on Test and Evaluation of T-22 Feed Mechanism, dated 21 February. Record Group 74; Box 865; National Archives, College Park, MD.
- W-2 Chief, Bureau of Aeronautics.**
1953 NAAS/NOTS Chincoteague, VA Ammunition Storage, Evaluation of, dated 29 December. Record Group 74; Entry 1005; Box 24; File NA111; National Archives, College Park, MD.
- W-3 Chief of the Bureau of Ordnance.**
1950 Inspection of Station Facilities dated 10 March. Record Group 74, Box 865, National Archives, College Park, MD.
- W-4 U.S. Naval Aviation Ordnance Test Station.**
1954 Instrumentation and Test Procedure for Measuring Firing Time Interval in Aircraft Machine Gun Ammunition, Development of, dated 27 May. Record Group 74; Entry 1007; Box 32; Folder NA111; National Archives, College Park, MD.
- W-5 U.S. Naval Aviation Ordnance Test Station.**
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W-10 Navy Department, Washington, DC.

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W-11 U.S. Naval Aviation Ordnance Test Station.

1947 Correspondence to the Chief of the Bureau of Ordnance, dated 20 January, regarding SWOD MK 9 Med O Med 1 “Bat” Evaluation Test and Training Program, Report of. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

W-12 U.S. Naval Aviation Ordnance Test Station.

1947 Correspondence to the Co-member, Air Coordinating Committee, Airspace Subcommittee, dated 27 January, regarding Danger Area about Proposed Water Target in Chesapeake Bay, Request for. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

W-13 U.S. Naval Aviation Ordnance Test Station.

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W-14 HQ Fifth Naval District, Norfolk 11 Virginia.

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W-17 Acting Secretary of the Navy.

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W-18 U.S. Naval Aviation Ordnance Test Station.

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W-19 U.S. Naval Aviation Ordnance Test Station.

1948 Correspondence to the Chief of the Bureau of Yards and Docks, dated 30 April, regarding Annual Inspection of Public Works and Public Utilities, Submission of. Record Group 74; Entry 1002C; Box 197; Folder NA111; National Archives, College Park, MD.

W-20 U.S. Naval Aviation Ordnance Test Station.

1948 Correspondence to the Chief of the Bureau of Ordnance, dated 14 June, regarding Test Range Instrumentation – Request for Project for Installation. Record Group 74; Entry 1002C; Box 197; Folder NA111; National Archives, College Park, MD.

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1949 Report on Wallops Island Range Interference, dated 4 March. Record Group 74; Entry 1003A; Box 578; File NA111; National Archives, College Park, MD.

W-22 United States Atlantic Fleet Air Force.

1947 Correspondence to the Chief of the Bureau of Ordnance, dated 22 September, regarding Aircraft Service and Training Munitions at East and Record Group 74; Entry 1003A; Box 578; File NA111; National Archives, College Park, MD.

W-23 The Chief of the Bureau of Ordnance.

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W-24 U.S. Naval Aviation Ordnance Test Station.

1949 Correspondence to the Chief of the Bureau of Ordnance, dated 12 October, regarding Air Danger Areas and Airspace Warning Areas for use by U.S. Naval Aviation Ordnance Test Station, Chincoteague, VA, Status of. Record Group 74; Entry 1001; Box 98; File NA111; National Archives, College Park, MD.

W-25 U.S. Naval Guided Missile Unit No. 11.

1953 Correspondence to the Chief of the Bureau of Ordnance, dated 23 September, regarding Special Training, Monthly Report, Submission of. Record Group 74; Entry 1005; Box 24; File NA111; National Archives, College Park, MD.

W-26 Department of the Navy, Bureau of Ordnance.

1953 Correspondence to the U.S. Naval Aviation Ordnance Test Station, dated 9 November, regarding 2.74 Aircraft Recoilless Rocket Launcher, Support of. Record Group 74; Entry 1005; Box 24; File NA111; National Archives, College Park, MD.

W-27 Department of the Navy, Office of the Naval Material.

1955 Correspondence to the Chief of the Bureau of Ordnance, dated 21 November, regarding DoD Identification Code for Interchangeability of Ammunition and Explosives. Record Group 74; Entry 1008; Box 103; Folder XI, National Archives, College Park, MD.

W-28 U.S. Naval Aviation Ordnance Test Station.

1953 Technical Report on Evaluation of Gunboat Point, Wallops Island, Virginia; NAOTS Report No. 46, dated 21 August. Record Group 74; Box 865; National Archives, College Park, MD.

W-29 Fifth Naval District.

1950 Drawing, dated December 1949; Five Year Shore Station Development Program, NAOTS Wallops Island Facilities, Chincoteague, VA; Site Plan; Development Program for Year 1951. Record Group 74; Entry 1001; Box 62; File NN-Z; National Archives, College Park, MD.

W-30 Ballistic Research Laboratories, Ordnance Department.

1946 Report on Tests of the German 30mm Aircraft Gun MK 103, Army Ballistic Research Lab, Aberdeen Proving Ground, MD, dated 05 September. AD Number AD492763, Defense Technical Information Center, Ft. Belvoir, VA.

W-31 U.S. Naval Weapons Lab.

1947 Report on Muzzle Velocity of 20mm M3 Automatic Gun, Naval Weapons Lab, Dahlgren, VA, dated 13 June. AD Number AD044996, Defense Technical Information Center, Ft. Belvoir, VA.

W-32 U.S. Naval Weapons Lab.

1948 Report on Ground Testing of 20mm Automatic Gun T-34, Naval Weapons Lab, Dahlgren, VA, dated 28 October. AD Number AD221205, Defense Technical Information Center, Ft. Belvoir, VA.

W-33 U.S. Naval Weapons Lab.

1951 Report on Development of a Propellant for the 20mm Aircraft Gun, MK 12, Partial Rept. No. 1, Development of 20mm and 30mm Aircraft Ammunition, Naval Weapons Lab, Dahlgren, VA, dated 26 July. AD Number AD223852, Defense Technical Information Center, Ft. Belvoir, VA.

W-34 NPG Report No. 1115.

1953 Report on Tests of Point Detonating Fuze T195E11 for 20mm Ammunition. AD Number AD009074, Defense Technical Information Center, Ft. Belvoir, VA.

W-35 U.S. Naval Weapons Lab.

1954 Report on 20mm Aircraft Gun MK 12 MOD 0 Experimental and Development Tests. Partial Rept. No. 6; 20mm Feed Mechanism, MK 7 MOD 0 Preliminary Investigation of Pneumatic Pressure Variations During Fire, Naval Weapons Lab, Dahlgren, VA, dated 14 January. AD Number AD310062, Defense Technical Information Center, Ft. Belvoir, VA.

W-36 U.S. Naval Aviation Ordnance Test Station.

1955 Report on Assembly, Fit, Flight, and Drop Tests on EX 14 MODS 2 and 3, 1000-lb Low Drag Fire Bomb, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 09 March. AD Number AD058742, Defense Technical Information Center, Ft. Belvoir, VA.

W-37 U.S. Naval Aviation Ordnance Test Station.

1955 Annual Technical Progress Report on Research and Development (Aircraft Fire Control, Guided Missiles, Aircraft Ordnance Stores, Aircraft Weapons, Ballistics Services, Research Engineering and Laboratory Services, Flight Aircraft), Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 08 April. AD Number AD060220, Defense Technical Information Center, Ft. Belvoir, VA.

W-38 U.S. Naval Aviation Ordnance Test Station.

1955 Report on Test and Evaluation of the Bomb Director Mark 8 MOD 0, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 12 July. AD Number AD067384, Defense Technical Information Center, Ft. Belvoir, VA.

W-39 U.S. Naval Aviation Ordnance Test Station.

1955 Final Report on Fit, Filling, High-Speed Flight, and Drop Tests of Bomb, Practice, 1000-lb, EX 16 MOD 1, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 25 August. AD Number AD070348, Defense Technical Information Center, Ft. Belvoir, VA.

W-40 U.S. Naval Aviation Ordnance Test Station.

1955 Report on Aircraft Fire Control System Mark 21, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 03 November. AD Number AD075730, Defense Technical Information Center, Ft. Belvoir, VA.

W-41 U.S. Naval Aviation Ordnance Test Station.

1956 Report on NAOTS Principal East Coast Test and Evaluation Activity. Control Systems, Aviation Ordnance, Guided Missiles, Pyrotechnics, Countermeasures, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated February. AD Number AD101931, Defense Technical Information Center, Ft. Belvoir, VA.

W-42 U.S. Naval Aviation Ordnance Test Station.

1956 Report on Captive Flight. Arming Time and Fit Tests on the M172 (T738) Bomb Tail Fuze with Field Fix and Factory Modifications, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 06 March. AD Number AD099987, Defense Technical Information Center, Ft. Belvoir, VA.

W-43 U.S. Naval Aviation Ordnance Test Station.

1956 Annual Technical Progress Report 1 January – 31 December 1955, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 06 March. AD Number AD090237, Defense Technical Information Center, Ft. Belvoir, VA.

W-44 U.S. Naval Aviation Ordnance Test Station.

1956 Final Report on Ground and High-Speed Flight Tests of Bomb, Practice, 56-lb, Type EX 27 MOD 1, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 10 April. AD Number AD090236, Defense Technical Information Center, Ft. Belvoir, VA.

W-45 U.S. Naval Aviation Ordnance Test Station.

1956 Report on Missile Trajectory and Attitude Data from Drone POD Camera Computations, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 18 April. AD Number AD098377, Defense Technical Information Center, Ft. Belvoir, VA.

W-46 U.S. Naval Aviation Ordnance Test Station.

1956 Final Report on FIT, Filling, High-Speed Flight, and Drop Tests of Bomb, EX 28, MODS 0 and 1 (Practice 250 Pounds), Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 26 April. AD Number AD092387, Defense Technical Information Center, Ft. Belvoir, VA.

W-47 U.S. Naval Aviation Ordnance Test Station.

1956 Report on Feasibility Test and Impact Area Comparison of VT Fuzed Fire Bomb, MK 77 MOD 0, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 16 May. AD Number AD098376, Defense Technical Information Center, Ft. Belvoir, VA.

W-48 U.S. Naval Aviation Ordnance Test Station.

1956 Report on Infrared Fire Control Assembly AN/UAG-1 Mark 1 MOD 0. Report of Evaluation of Letter Report No. 1, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 08 June. AD Number AD124521, Defense Technical Information Center, Ft. Belvoir, VA.

W-49 U.S. Naval Aviation Ordnance Test Station.

1956 Report on Aircraft Fire Control System Mark 21, Director Mode of Operations in Air-to-Air Gunnery, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 22 June. AD Number AD100675, Defense Technical Information Center, Ft. Belvoir, VA.

W-50 U.S. Naval Aviation Ordnance Test Station.

1956 Report on Evaluation of Fire Bomb Fuels Test 2, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 26 June. AD Number AD100560, Defense Technical Information Center, Ft. Belvoir, VA.

W-51 U.S. Naval Aviation Ordnance Test Station.

1956 Final Report on Ground and High-Speed Flight Tests of Bomb, Practice, 25-Pound, MK MOD 3, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 30 September. AD Number AD132297, Defense Technical Information Center, Ft. Belvoir, VA.

W-52 U.S. Naval Aviation Ordnance Test Station.

1957 Final Report on Fit, Filling, High-Speed Flight and Drop Tests of Bomb, Practice, 500-lb, EX 29 MOD 0, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 21 February. AD Number AD123306, Defense Technical Information Center, Ft. Belvoir, VA.

W-53 U.S. Naval Aviation Ordnance Test Station.

1957 Final Report on Ground and High-Speed Flight Tests of Bomb, Practice, 56-lb, Type EX 27 MOD 3, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 08 April. AD Number AD127472, Defense Technical Information Center, Ft. Belvoir, VA.

W-54 U.S. Naval Aviation Ordnance Test Station.

1957 Final Report on Assembly, Fit, High-Speed Flight and Drop Tests of Bomb, Practice, MK 79 MOD 0 (Fire, 1000-lb), Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 22 August. AD Number AD140147, Defense Technical Information Center, Ft. Belvoir, VA.

W-55 U.S. Naval Aviation Ordnance Test Station.

1957 Final Report on Assembly, Fit, High-Speed Flight and Drop Tests of the E114 Plastic Fire Bomb, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 10 September. AD Number AD141090, Defense Technical Information Center, Ft. Belvoir, VA.

W-56 U.S. Naval Aviation Ordnance Test Station.

1957 Report of Evaluation of Nite Owl, Prototype Closed-Circuit Television; Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 07 October. AD Number AD146162, Defense Technical Information Center, Ft. Belvoir, VA.

W-57 U.S. Naval Aviation Ordnance Test Station.

1957 Final Report on Ground and High-Speed Flight Test of Bomb, Practice, 56-lb, Type EX 27 MODS 4 and 5, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 26 November. AD Number AD147418, Defense Technical Information Center, Ft. Belvoir, VA.

W-58 U.S. Naval Aviation Ordnance Test Station.

1958 Report on Mark 9 Bomb Director Wind Studies, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 03 June. AD Number AD300052, Defense Technical Information Center, Ft. Belvoir, VA.

W-59 U.S. Naval Aviation Ordnance Test Station.

1958 Final Report on the Infrared Air-to-Ground Scanner AN/AAS-4, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 12 June. AD Number AD300053, Defense Technical Information Center, Ft. Belvoir, VA.

W-60 U.S. Naval Aviation Ordnance Test Station.

1958 Final Report of Forty-Foot Drop, Static Ejection, Flight Ejection and Simulated Loss of Store Tests of Bomb, Photoflash, M122, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 04 September. AD Number AD202475, Defense Technical Information Center, Ft. Belvoir, VA.

W-61 U.S. Naval Aviation Ordnance Test Station.

1958 Final Report of Design, Development and Strength, Fit and Captive Flight Tests of a Suspension Lug for MK 76 MODS 2 and 3 and MK 89 (EX 27) Practice Bombs, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 30 September. AD Number AD160281, Defense Technical Information Center, Ft. Belvoir, VA.

W-62 U.S. Naval Aviation Ordnance Test Station.

1958 Final Report of the Evaluation of the AAS-4 Infrared Sensor for use as a Night Viewfinder for Naval Reconnaissance Aircraft, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 11 December. AD Number AD305057, Defense Technical Information Center, Ft. Belvoir, VA.

W-63 U.S. Naval Aviation Ordnance Test Station.

1959 Final Report of the Test and Evaluation of the AN/AAA-2 (XN-1) Receiver Group, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 11 February. AD Number AD305497, Defense Technical Information Center, Ft. Belvoir, VA.

W-64 U.S. Naval Aviation Ordnance Test Station.

1959 Final Report of the Flight Evaluation of the Rocket Firing Error Indicator, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 24 February. AD Number AD211887, Defense Technical Information Center, Ft. Belvoir, VA.

W-65 U.S. Naval Aviation Ordnance Test Station.

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W-66 U.S. Naval Aviation Ordnance Test Station.

1959 Report on the Air-to-Ground Infrared Survey Study, Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 12 March. AD Number AD212087, Defense Technical Information Center, Ft. Belvoir, VA.

W-67 U.S. Naval Aviation Ordnance Test Station.

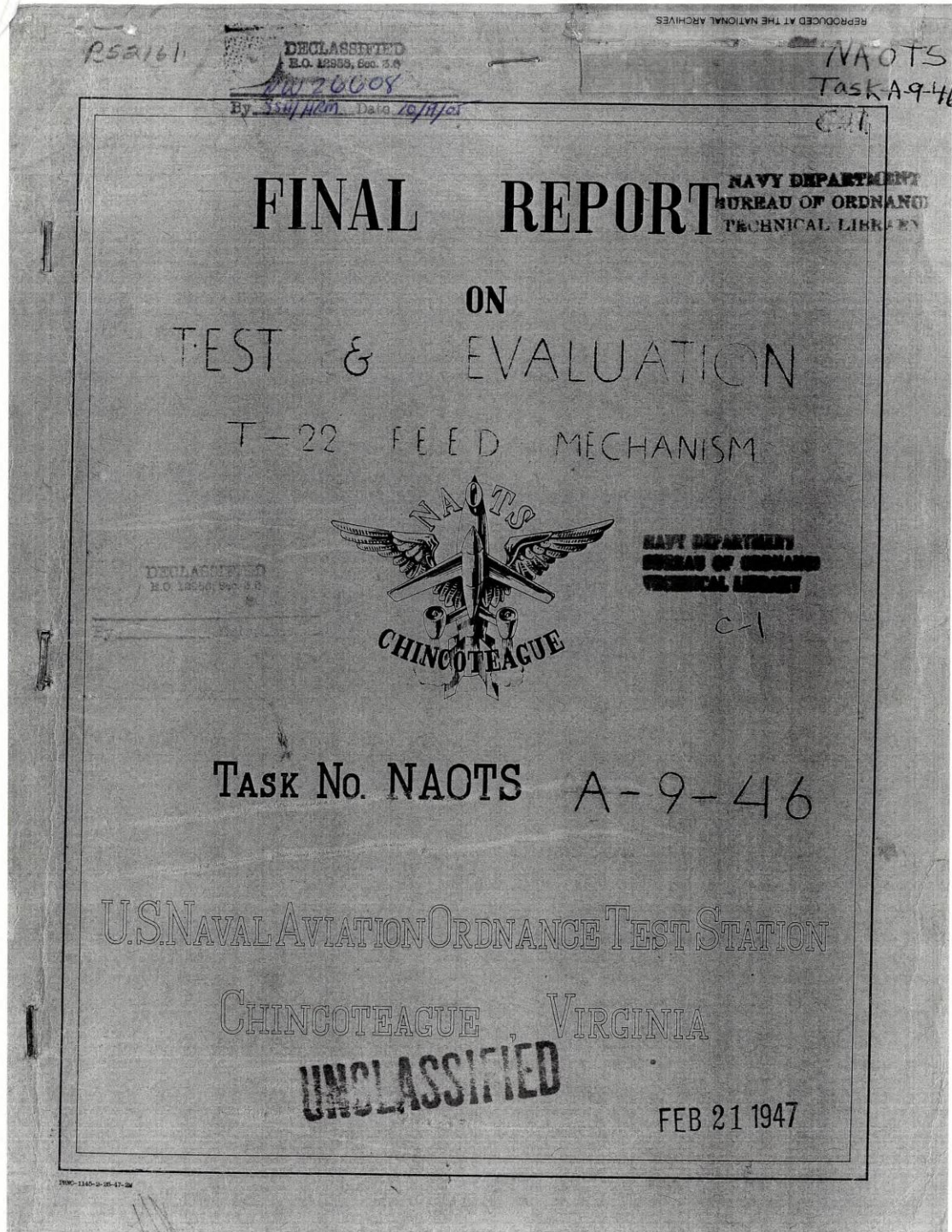
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W-68 U.S. Naval Aviation Ordnance Test Station.

1959 Final Report of Ground and High-Speed Flight Test of Bomb, Practice, 25-lb, MK 76 MOD 3 (Experimental), Naval Aviation Ordnance Test Station, Chincoteague, VA, dated 30 September. AD Number AD211886 Defense Technical Information Center, Ft. Belvoir, VA.

W-1 U.S. Naval Aviation Ordnance Test Station.

1947 Final Report on Test and Evaluation of T-22 Feed Mechanism, dated 21 February. Record Group 74; Box 865; National Archives, College Park, MD.



NAOTS/A1-1 U. S. NAVAL AVIATION ORDNANCE TEST STATION
(ON24/HFL:b) Chincoteague, Virginia

UNCLASSIFIED

21 February 1947

~~SECRET~~
From: The Commanding Officer
To: The Chief of the Bureau of Ordnance
Subj: TASK ASSIGNMENT NAOTS A-9-46, TEST AND EVALUATION OF
T-22 FEED MECHANISM.
Ref: (a) BuOrd ltr F41-5 (Re8a) dated 12 June 1946,
(Task Directive)
Encl: (A) NAOTS Chincoteague, Va., restricted report A-9-46
dated 21 February 1947

1. The purpose of the test requested by reference (a) was to test and evaluate the T-22 Feed Mechanism used with the 20MM Automatic Gun T-31.
2. It is concluded that the T-22 Feed Mechanism is unsatisfactory for service use in its present design.
3. It is recommended that the T-22 Feed Mechanism have certain modifications listed under "Recommendations" of the enclosed report and this modified Feed Mechanism be submitted for further tests.
4. The subject task assignment has been completed and the final report is forwarded herewith as Enclosure (A).

W. V. R. Vieweg
W. V. R. VIEWEG

Distribution:

As indicated in Appendix B

Classification cancelled or changed to _____
by authority of *OP 96, memo #7, on 11 May 57*
S. M. Sullister 13 Jul 57
NAVY BUREAU OF ORDNANCE

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

RESTRICTED

21 February 1947

FINAL REPORT ON

TASK N.A.O.T.S. A-9-46

TEST AND EVALUATION OF THE T-22 FEED MECHANISM

HELD

14 JUNE 1946 TO 15 FEBRUARY 1947

AT

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

Prepared by: W. B. Sumpter
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Head, Engineering Div.

Approved: T. H. Moorer
T. H. Moorer
Comdr., U. S. Navy
Executive Officer

- 1 -

NAOTS/A1-1 U. S. NAVAL AVIATION ORDNANCE TEST STATION
(ON24/HFL:b) Chincoteague, Virginia

UNCLASSIFIED

21 February 1947

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From: The Commanding Officer
To: The Chief of the Bureau of Ordnance
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Encl: (A) NAOTS Chincoteague, Va., restricted report A-9-46
dated 21 February 1947

1. The purpose of the test requested by reference (a) was to test and evaluate the T-22 Feed Mechanism used with the 20MM Automatic Gun T-31.
2. It is concluded that the T-22 Feed Mechanism is unsatisfactory for service use in its present design.
3. It is recommended that the T-22 Feed Mechanism have certain modifications listed under "Recommendations" of the enclosed report and this modified Feed Mechanism be submitted for further tests.
4. The subject task assignment has been completed and the final report is forwarded herewith as Enclosure (A).

W. V. R. Vieweg
W. V. R. VIEWEG

Distribution:

As indicated in Appendix B

Classification cancelled or changed to _____
by authority of *OP 96, memo 47, on 11 May 57*
S. M. Sullister 13 Jul 57
NAVY BUREAU OF ORDNANCE

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

RESTRICTED

TASK NO. A-9-46

21 February 1947

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U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~

TASK NO. A-9-46

21 February 1947

INTRODUCTION

- (a) The Test and Evaluation of the T-22, 20MM Feed Mechanism was initiated by BuOrd ltr F41-5 (Re8a) of 12 June 1946 (Task Assignment N.A.O.T.S. A-9-46).
- (b) Description - The T-22, 20MM Feed Mechanism is a complete unit used for feeding belted ammunition to the T-31 (M-3) 20MM automatic gun. There are two distinct T-22 Feed Mechanisms, one which feeds ammunition to the gun from the right hand side and the other which feeds from the left (see plates Nos. 1, 2, 3, 4 and 5, and War Department Technical Manual 9-229 on the T-15, 20MM Feed Mechanism). The function of the feed mechanism is to bring belted ammunition to the gun; separate the rounds from the links; and feed the rounds one at a time into the gun.

The T-22 feed is operated by the recoil of the gun instead of by a motor drive as in the T-15 feed. This feed mechanism is designed to store some of the energy of the recoiling parts in a spring which maintains a torque of 160 to 225 in. - lbs., on the feed shaft. This is accomplished in the T-22 Feed Mechanism by a rewind shaft parallel to the gun bore, which eliminates the levers used by the M-2 feed, thus affecting a reduction in profile of the T-22 Feed Mechanism.

- (c) Technical Manual 9-229 on the T-15 Feed Mechanism by the War Department was used as a reference in this project.

OBJECT

1. To obtain data and performance on the T-22 Feed Mechanism as follows:
 - (a) Weight of feed mechanism complete with any necessary accessories.
 - (b) Any modification of gun or its accessories required for installation or operation of feed mechanism.
 - (c) Total number of rounds fired at each malfunction. Type of malfunction and cause of malfunction.
 - (d) Ease of loading and unloading.
 - (e) Maximum length of belted ammunition and maximum weight that can be lifted vertically.

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OBJECT (Cont'd)

- (f) The effect of varying ammunition belt loads from maximum to minimum on rate of fire and reliability of operation of feed mechanism.
- (g) Effect and criticalness of maladjustment of feed mechanism, if this be possible.
- (h) Effect of excessive oil on feed mechanism.
- (i) Effect of functioning of the feed mechanism of firing with the gun rotated about its bore and trunnion axis.
- (j) Ease of field stripping and servicing.
- (k) Minimum recoil at which satisfactory operation can be obtained with varying belt loads.
- (l) Determine the characteristics of feed mechanism in normal flight and under "g" loading.
- (m) Determine any peculiarities of the feed mechanism, or gun and feed mechanism combination, that might affect operation in service use and make recommendations for improvement in design and operation.

CONCLUSIONS

1. As a result of tests the following conclusions were reached:

(a) The T-22 Feed Mechanism with accessories weighs:

T-22 Mechanism	18 lbs. 5 oz.
Accessories	
Receiver	1 lb.
Magazine Slide	2 lbs. 4 oz.
Total Weight	21 lbs. 9 oz.

(b) Modification of gun or its accessories required for installation or operation of feed mechanism.

(A) The T-31 gun must be fitted with receiver bracket mounted on rear end of receiver as shown in Plates #9, #10 and #11.

(B) Change magazine slides as shown in Plate #11.

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CONCLUSIONS (Cont'd)

- (c) Total number of rounds fired at each malfunction. Type of malfunction and cause of malfunction.
 - (A) After firing 5 to 15 rounds on each feed mechanism on hand the retainer ring on rewind screw spread and came off. The rewind screw and retainer ring were modified as shown in Plate #6. No further difficulty was experienced with spreading of the retainer ring.
 - (B) After correcting above defect only 25 to 30 continuous rounds could be fired with the T-22 Feed before the torque spring became wound so tightly that the bolt was unable to properly push cartridge from throat of feed. The torque discs were reset from an indicated 450 in. - lbs to 225 in. - lbs. With this setting, no further difficulty was experienced because of excessive tension.
 - (C) After 240 rounds were fired in the air test, the modified retainer ring vibrated loose, resulting in a stoppage due to loss of power in spring. A set screw was added to a retainer ring as shown in Plates No. 15 and 16. Constant checking of the tightness of these parts prevented further difficulty.
 - (D) Other stoppages were caused by the usual link jams and improper belting of the ammunition.
- (d) Ease of loading and unloading.
 - (A) The feed is very easy to load, but it is impossible to unload the last three rounds without removing feed from the gun and hand running the rounds through the feed. No provision has been made to allow feed to run backward to permit backing out these rounds.
- (e) Maximum length of belted ammunition and maximum weight which can be lifted vertically.
 - (A) With a torque disc setting of 225 in. - lbs., the feed will lift 95 lbs. vertically without stoppage. This weight is equivalent to about 150 rounds of belted ammunition.

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CONCLUSIONS (Cont'd)

- (f) The effect of varying ammunition belt loads from maximum to minimum on rate of fire and reliability of operation of feed mechanism.
 - (A) Varied belt loads of 10 rounds to 95 lbs. pull produce no noticeable effect on rate of fire or reliability of the feed. The average rate of fire was 660 rounds/minute, as measured by a Counter - Chronograph.
- (g) Effect and criticalness of maladjustment of feed mechanism, if this be possible:
 - (A) If the torque disc is set over 250 in. - lbs., the power spring will exert so much pressure on the cartridge that the bolt fails to pick it up properly which results in ruptured cartridges as shown in Plate #8. Torque discs may be easily set by the use of the torque setting wrench.
 - (B) Special care must be used in installing the Horton Clutch as improper assembly will prevent operation of the feed.
- (h) Effect of excessive oil on feed mechanism:
 - (A) No loss of torque or other effect was apparent after firing two 100 round bursts with the feed mechanism drenched in oil.
- (i) Effect of functioning of the feed mechanism of firing with the gun rotated about its bore and trunnion axis.
 - (A) Satisfactory operation was obtained when the gun was rotated from 090 to 270 through an arc of 180° in 45° steps about its bore axis. Similar results were obtained when the gun was rotated from minus 45° to plus 45° about its trunnion axis. No measurable effect on rate of fire was obtained when the gun was rotated about its bore axis. No change in rate of fire could be detected while rotating the gun about its trunnion axis.
*000 is the normal position of the gun.
- (j) Ease of field stripping and servicing.
 - (A) No unusual difficulties.

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CHINCOTEAGUE, VIRGINIA

-RESTRICTED-

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CONCLUSIONS (Cont'd)

- (k) Minimum recoil at which satisfactory operation can be obtained with varying belt loads.
 - (A) The minimum recoil at which satisfactory operation can be obtained is 23/32 of an inch.
- (l) Determine the characteristics of feed mechanism in normal flight and under "g" loading.
 - (A) Satisfactory operation was obtained during normal flight and under "g" loadings up to 7 g's by actual air firings in an F6F-5N aircraft.
- (m) Determine any peculiarities of the feed mechanism, or gun and feed mechanism combination that might affect operation in service use; and make recommendations for improvement in design and operation.
 - (A) Horton Clutch may be removed without affecting operation of the feed.
 - (B) Power spring is wound from the rear of the feed instead of the front as in the case of the M-2.
 - (C) Last round retainer finger breaks frequently resulting in damage to the last round.

RECOMMENDATIONS

1. It is recommended:
 - (a) that the T-22 Feed Mechanism be modified as follows:
 - (A) Redesign retainer ring, either actually as indicated in, or full equivalent, to Plates #15 and #16.
 - (B) Incorporate a throw-out clutch on the rear end of the feed shaft to permit the operator to reverse feed at will.
 - (C) Strengthen last round retainer finger.
 - (D) Harden rewind screw receiver so as to stop wear and chaffing.
 - (E) Eliminate the Horton Clutch as shown in Plates #12 and #13.

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RECOMMENDATIONS (Cont'd)

- (b) that feeds modified as indicated above be submitted for further tests.

RECORD AND DISCUSSION OF TESTS

1. Chronological data

- (a) June 14, 1946, received project directive, BuOrd ltr F41-5 (Re8a) of June 12, 1946.
- (b) August 15, 1946, received four (4) 20MM T-31 Aircraft Machine Guns and four (4) T-22 Feed Mechanisms.
- (c) October 20, 1946, received "I" Beams for concrete base for installation of the gun mounts.
- (d) October 27, 1946, designed and manufactured one 20MM Gun Mount suitable for test.
- (e) November 7, 1946, commenced firing to check mount and feed for safe operations. Operated safely and satisfactorily.
- (f) November 14, 1946, Retainer ring on rewind screw spread and came loose on both left and right hand feeds after an average firing of 10 rounds.
- (g) November 18, 1946, manufactured and tested modified ring on rewind screw. Operated satisfactorily.
- (h) November 18, 1946, last cartridge holding finger broke off at 150 rounds.
- (i) November 25, 1946, during continuous firing excessive spring tension wound up on the feed power spring.
- (j) November 27, 1946, Naval Gun Factory Representative demonstrated how to change torque disc setting.
- (k) November 29, 1946, tested feed with Horton Clutch removed. Worked satisfactorily.
- (l) December 8, 1946, continued torque tension test on feed set at 225 in. - lbs., results satisfactory.
- (m) December 12, 1946, commenced lift test using lead weights.

U. S. NAVAL AVIATION ORDNANCE TEST STATION
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RECORD AND DISCUSSION OF TESTS (Cont'd)

- (n) December 20, 1946, completed lift and pull test.
- (o) December 24, 1946, tested feed with excessive oil.
- (p) January 14, 1947, commenced rate of fire test.
- (q) January 16, 1947, test fired gun around bore axis 090° to 270°.
- (r) January 21, 1947, commenced air test of feed.
- (s) January 31, 1947, tested rate of fire with maximum load.

2. Upon receipt of the four(4) T-31 20MM guns #8198, #1275, #8083, #10790 and T-22, 20MM Feed Mechanisms from BuOrd for test and evaluation, the following week was spent in familiarizing the test crew with T-22 Feed.

The T-31 20MM Gun was taken to the Machine Shop and a receiver bracket for the Rewind Screw installed 1/16" forward of the Back Plate slot on top of the gun receiver as shown in Plates #5, #9, #10 and #11. Attachment was made by two 3/8" diameter bolts.

3. The T-31 20MM Gun equipped with the T-22 Feed Mechanism was mounted on a fixed mount on the machine gun range. The mechanical operation of the feed was checked by pulling five rounds through by hand.
4. A belt of ten (10) rounds was inserted in the feed and it was checked for continuous fire. At five rounds a first position stoppage occurred. Malfunction - Retaining ring for anti-friction washers spread and came off. Tried the remaining three (3) T-22 Feeds and the same malfunction occurred before ten rounds were expended in any feed. The anti-friction unit was modified as illustrated in Plates #6 and #7. This modification increased the width and depth of retainer ring groove to 1/16" x 1/16". The three anti-friction washers and retainer rings were discarded and a split ring enclosed in a steel keeper substituted. See Plates #15 and #16 for exploded view.
5. The gun, equipped with the T-22 Feed Mechanism as modified above, was then tested with 50 rounds. At 35 rounds a second position stoppage occurred rupturing and scarring shells as illustrated in Plate #8.

Malfunction - The bolt failed to push cartridge into battery because the feed power spring had built up excessive torque which held first round against feed mouth. Reducing maximum torque setting to 225 in. - lbs. gave satisfactory operation. Remaining tests were conducted with the modified rewind screw and a torque setting of 225 in. - lbs.

U. S. NAVAL AVIATION ORDNANCE TEST STATION
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TASK NO. A-9-46

21 February 1947

RECORD AND DISCUSSION OF TESTS (Cont'd)

6. Determination of belt pull was found by lifting lead weights attached to a cable run over a pulley and secured to the last link of a ten (10) round belt. The feed could lift 95 lbs. vertically, which is equivalent in weight to 150 rounds of belted ammunition, without materially affecting the rate of fire.

7. Cyclic rate was measured by using a 60 cycle portable Waukesha generator as the source of power, a "Strobatac" to maintain frequency, and a chronograph for metering out the contact rates on a tape.

A contact point was built on the gun cradle which made contact with the gas cylinder sleeve on recoil. The making of these contacts was recorded on the chronograph tape. The rate of fire was measured by comparing the contacts of the gun with the contacts of the 60 cycle Strobatac, which were also recorded on the chronograph tape.

Cyclic rates were measured using varied belt loads from 15 rounds to twenty rounds with 95 lbs. of lead weights. An average rate of fire of 660 rounds/minute was recorded.

8. The feed was then drenched with oil and given two 100 round bursts of continuous fire - no loss of torque or loss of cycle rate of fire could be detected.

9. The feed was rotated through an arc of 180° about the gun bore axis, firing at every 45° angle from 270° to 090° (000° is normal gun position). It was also fired in the air at angles about the trunnion axis from minus 45° to a plus 45° from the horizontal.

No noticeable effect on rate of fire was observed in either case. The measured rates of fire while rotating about bore axis were -

<u>ANGLE</u>	<u>RATE OF FIRE</u>
090°	600
045°	620
*000°	660
315°	600
270°	680
Average Rate of Fire	650

* 000° is with gun in normal position.

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RECORD AND DISCUSSION OF TESTS (Cont'd)

10. The minimum recoil at which satisfactory operation can be obtained is $23/32$ of an inch, as one quarter turn is lost on feeding a round into position for next round. The rewind screw must travel this $23/32$ of an inch to make up the lost quarter turn on the power spring. This was determined by direct measurement. The determination of this factor under operating conditions requires the firing of reduced charges and photographic measurement of recoil. Facilities for such a test are not yet available on this Station.
11. After adapting an M-2 Feed chute to fit the T-22 feed, the gun and feed were installed in an F6F, as shown in Plates #17 and #18, and were given 30 rounds air firing test to check feed and feed chute operation. On the first flight, gun ceased firing after five rounds. Plane returned to base where a link jam was cleared. On the second flight the 25 remaining rounds were fired satisfactorily in level flight.

The T-22 Feed Mechanism was then given a 200 round intermittent fire test during 30° dives and 2 "g" pull-outs firing approximately 50 rounds per operation for four (4) runs. Operation was satisfactory.

On fourth flight, gun was loaded with 140 rounds for intermittent firing under high "g" loading. It operated satisfactorily during 45° dives, and 7 "g" pull-outs. While no stoppages occurred, the rate of fire was somewhat reduced while the gun was under the high "g" loading. Four (4) satisfactory runs were made.
2. During the tests difficulty was experienced in clearing the T-22 Feed Mechanism of any jams, as the Horton Clutch did not allow the feed to turn in reverse. After discussion with N.G.F. Representatives the Horton Clutch was removed and tests resumed without loss of proficiency in operation of the feed mechanism. Removing the Horton Clutch made it possible to reverse the feed a small amount against the tension of the power spring. This movement permits the pressure on jams to be relaxed and materially expedites clearing of the T-22 Feed Mechanism.
- During the first part of the test the last round retainer finger broke on two (2) different feeds. Tests were continued without using the last round retainer finger. The only difficulty experienced was that the last round sometimes fell from the feed mouth and jammed. Though this difficulty had no effect on other tests, service use of the feed will require a more durable last round retainer finger. Broken finger is shown on Plate #19.
- Tests were started with M-3 links set at $2-3/8$ " from cartridge base as shown on decalcomania on the feed. This calibration operated satisfactorily.

U. S. NAVAL AVIATION ORDNANCE TEST STATION
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RECORD AND DISCUSSION OF TESTS (Cont'd)

However in using M-7 links with the feed, it was found that the distance must be 2-1/4" from the base of the cartridges to the links or they would jam against the link ejector chute.

MATERIAL AND EQUIPMENT USED IN T-22 TEST

1. Four T-31 20MM Guns #8198, #1275, #8083, and #10790.
2. Four T-22 Feeds, two right and two left handed #50111, #50129, #50137, and #50087.
3. M-3 and M-7 20MM links.
4. Two 12V storage batteries & firing pickle.
5. One combination portable 28V and 110V portable generator, one "Strobotac" and one Chronograph to measure rate of fire.
6. 1759 rounds of M21A1 T-24 practice 20MM ammunition.
7. One hundred pounds of lead.
8. Aluminum feed chute, 12' long.
9. One F6F-5N Airplane, BuNo. 94462.

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

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21 February 1947

APPENDIX A

INDEX OF PHOTOGRAPHS

<u>Plate No.</u>	<u>Title</u>
1. N.P.(5) 334	T-22 Feed - Topview R. H. Feed
2. N.P.(5) 333	T-22 Feed - Feed Cover OPEN
3. N.P.(5) 335	T-22 Feed - BOTTOM VIEW
4. N.P.(5) 389	T-22 Feed - Mounted on T-31 gun on Firing Mount
5. N.P.(5) 388	T-22 Feed - Mounted on T-33 gun on Firing Mount
6. N.P.(5) 246	T-22 Feed - Exploded View of Rewind Screw showing modified return collar.
7. N.P.(5) 527	T-22 Feed - (A) Original Rewind Screw and Accessories. (B) Modified Rewind Screw and Return Collar.
8. N.P.(5) 200	T-22 Feed - Damaged Cartridges caused by excess tension on Power Spring.
9. N.P.(5) 501	T-22 Feed - Bracket Mounted on T-31 Gun with old magazine slide.
10. N.P.(5) 506	T-22 Feed - Bracket Mounted on T-31 Gun with back plate off.
11. N.P.(5) 507	T-22 Feed - Bracket Mounted on T-31 Gun with magazine slide for T-22 Feed.
12. N.P.(5) 505	T-22 Feed - After end of feeder cap with Horton Clutch installed.
13. N.P.(5) 504	T-22 Feed - After end of feeder cap with Horton Clutch removed.
14. N.P.(5) 499	T-22 Feed - exploded view of Rewind Screw with broken retainer ring.

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21 February 1947

APPENDIX A (Cont'd)

INDEX OF PHOTOGRAPHS

<u>Plate No.</u>	<u>Title</u>
15. N.P.(5) 503	T-22 Feed - exploded view of modified rewind screw with locking return collar.
16. N.P.(5) 500	T-22 Feed - exploded view of modified rewind screw with return collar removed.
17. N.P.(5) 433	T-22 Feed - Feed with modified cartridge chute mounted in wing of F6F.
18. N.P.(5) 431	T-22 Feed - Feed with modified cartridge chute with feed cover open mounted in wing of F6F.
19. N.P.(5) 555	T-22 Feed - Broken last round retainer finger.

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

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21 February 1947

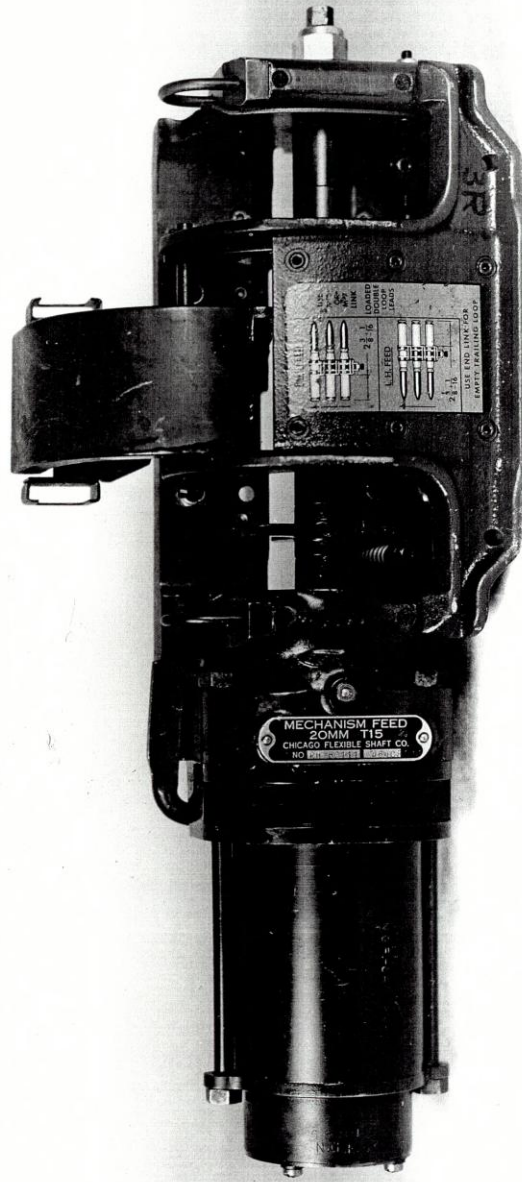
APPENDIX B

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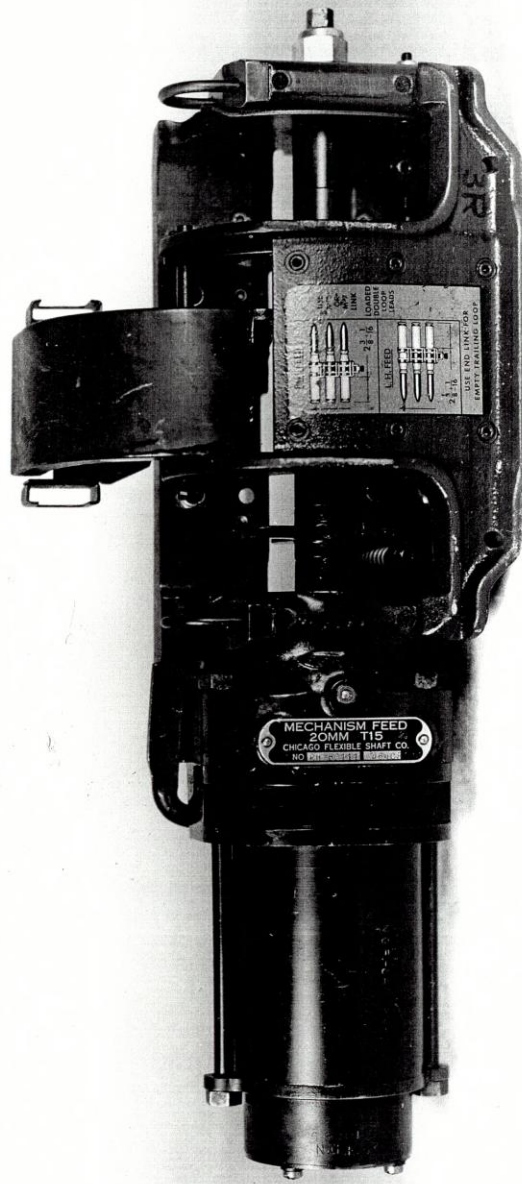
NAOTS CHINGO TEAGUE, VIRGINIA

T-22 FEED - TOP VIEW R. H. FEED

PLATE # 1

COMPTON

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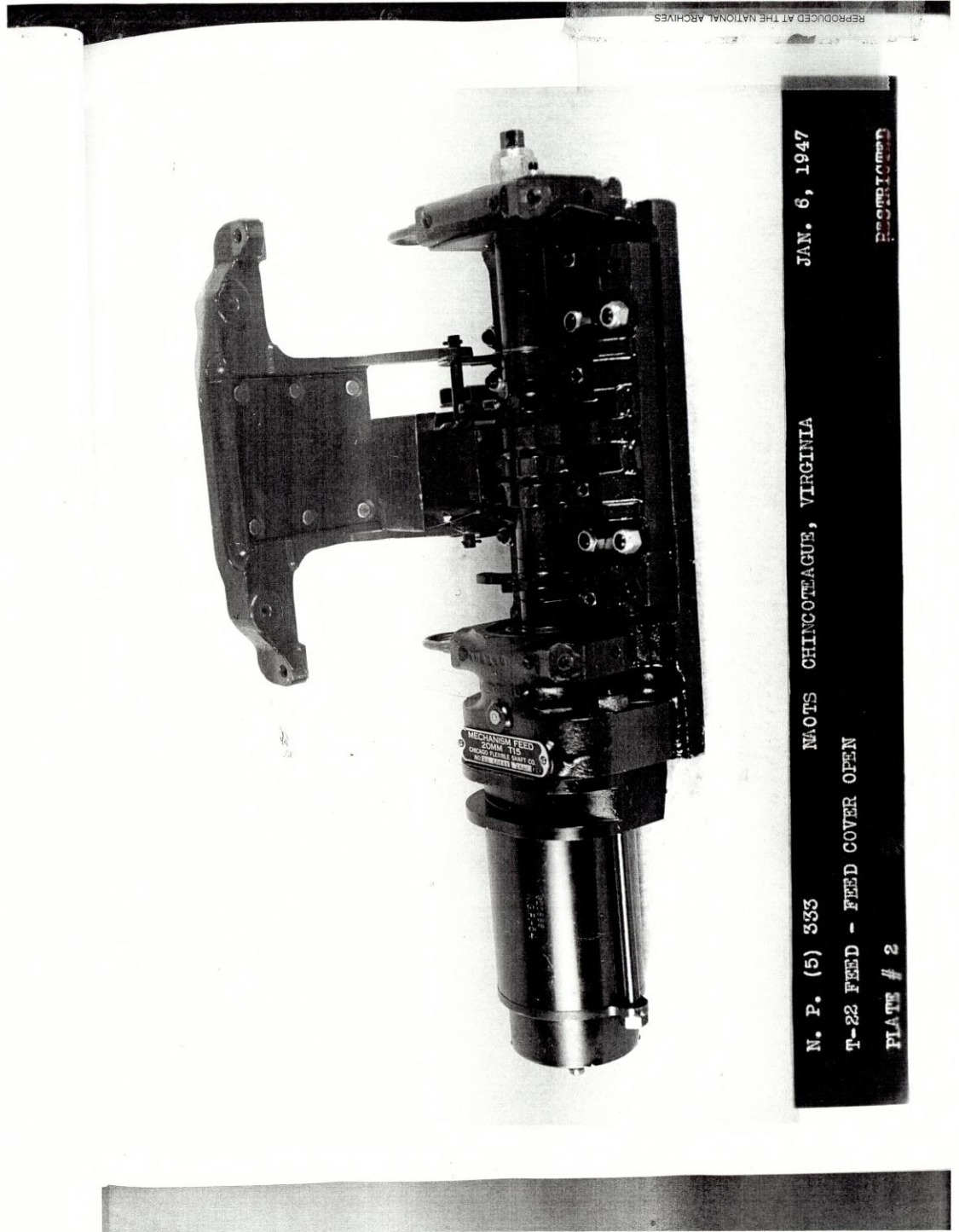
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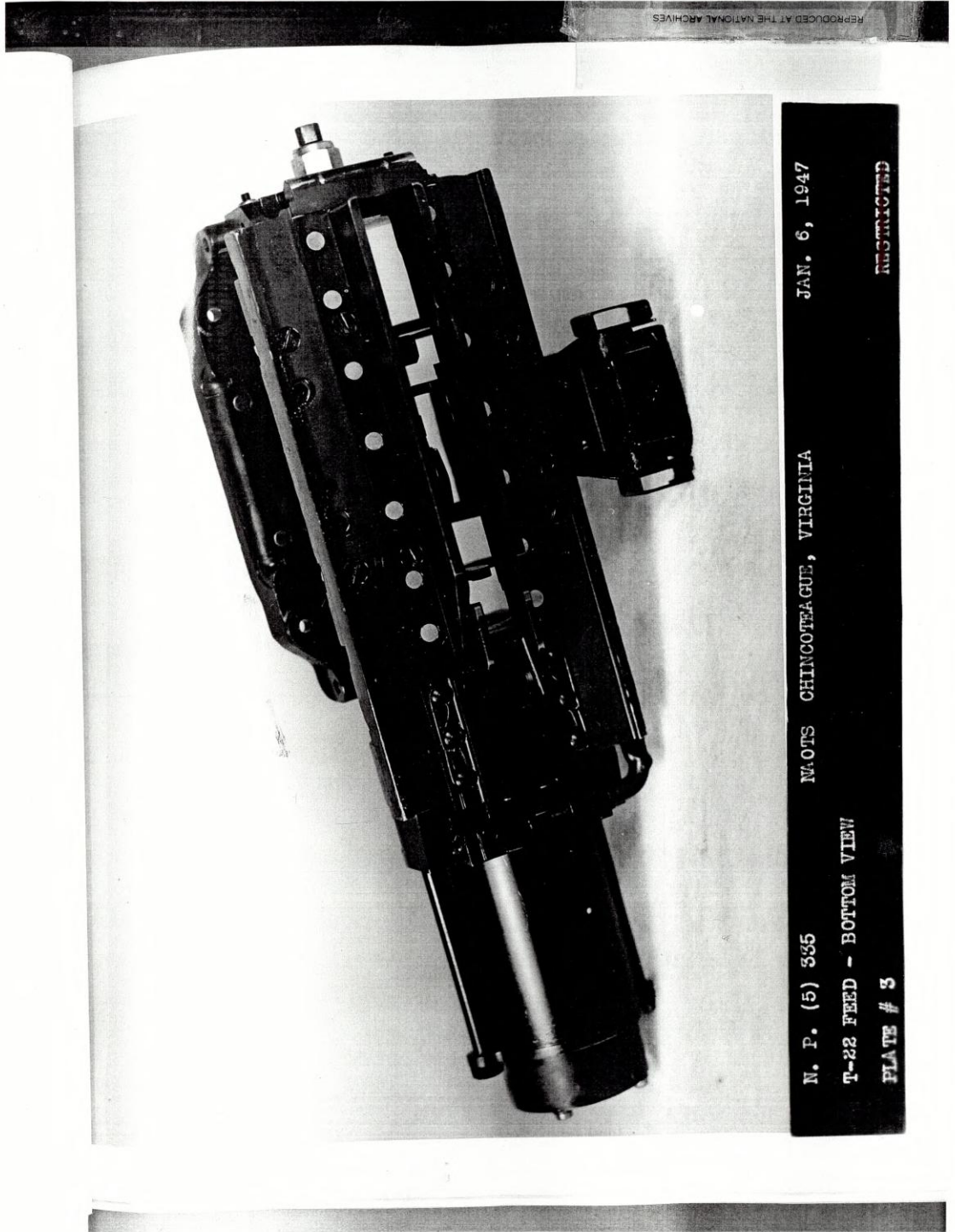
NAOTS CHINGO TEAGUE, VIRGINIA

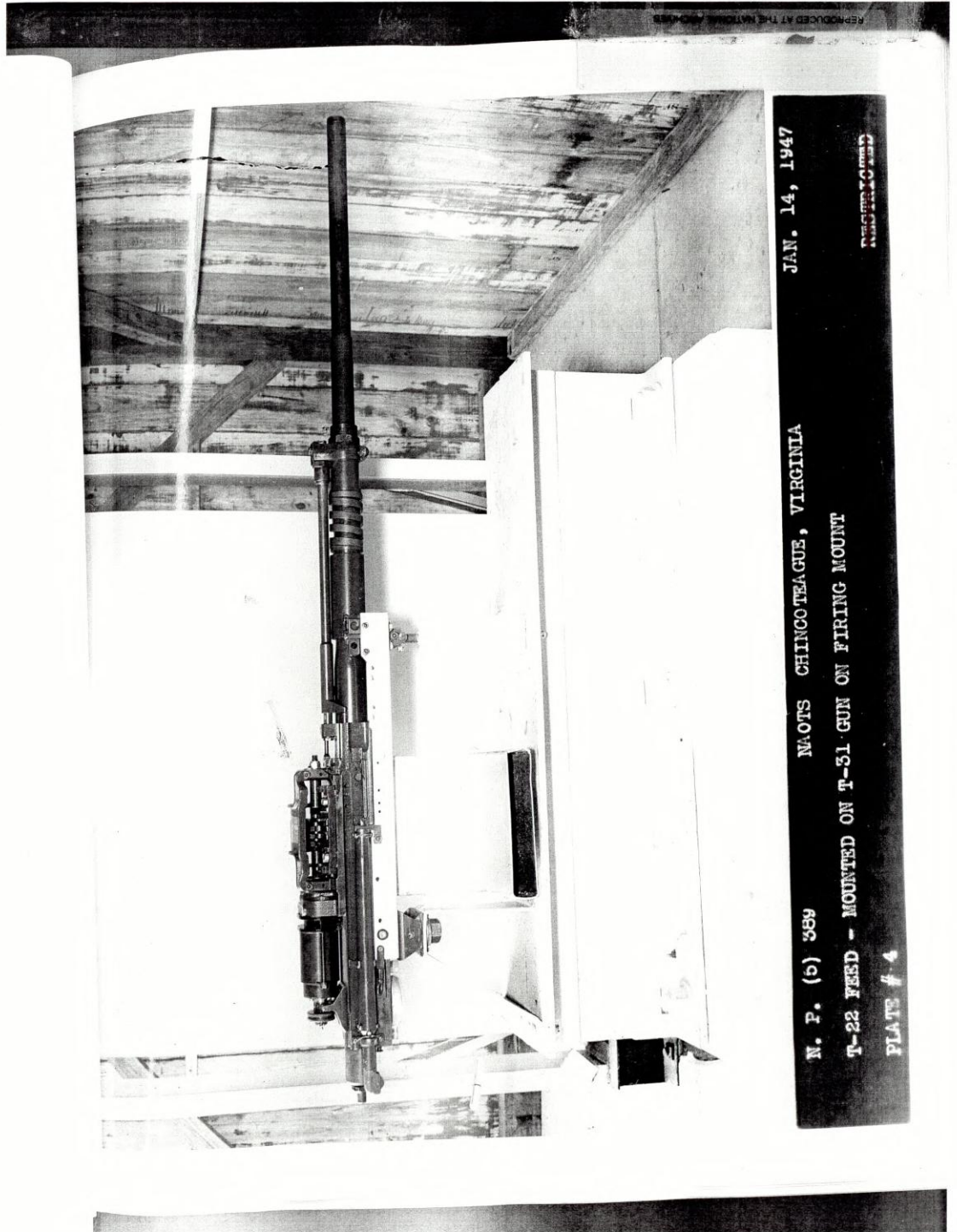
T-22 FEED - TOP VIEW R. H. FEED

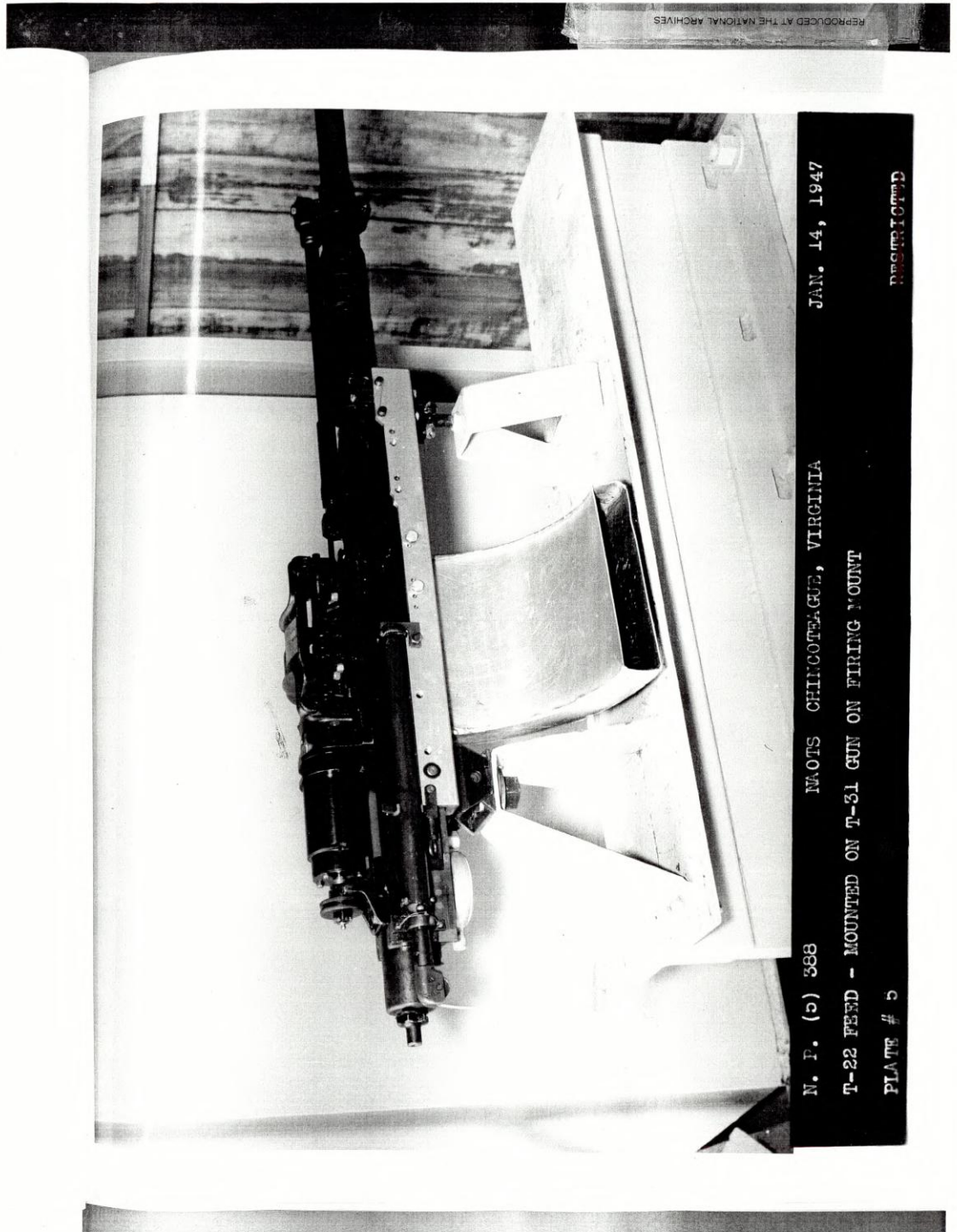
PLATE # 1

COMPTON









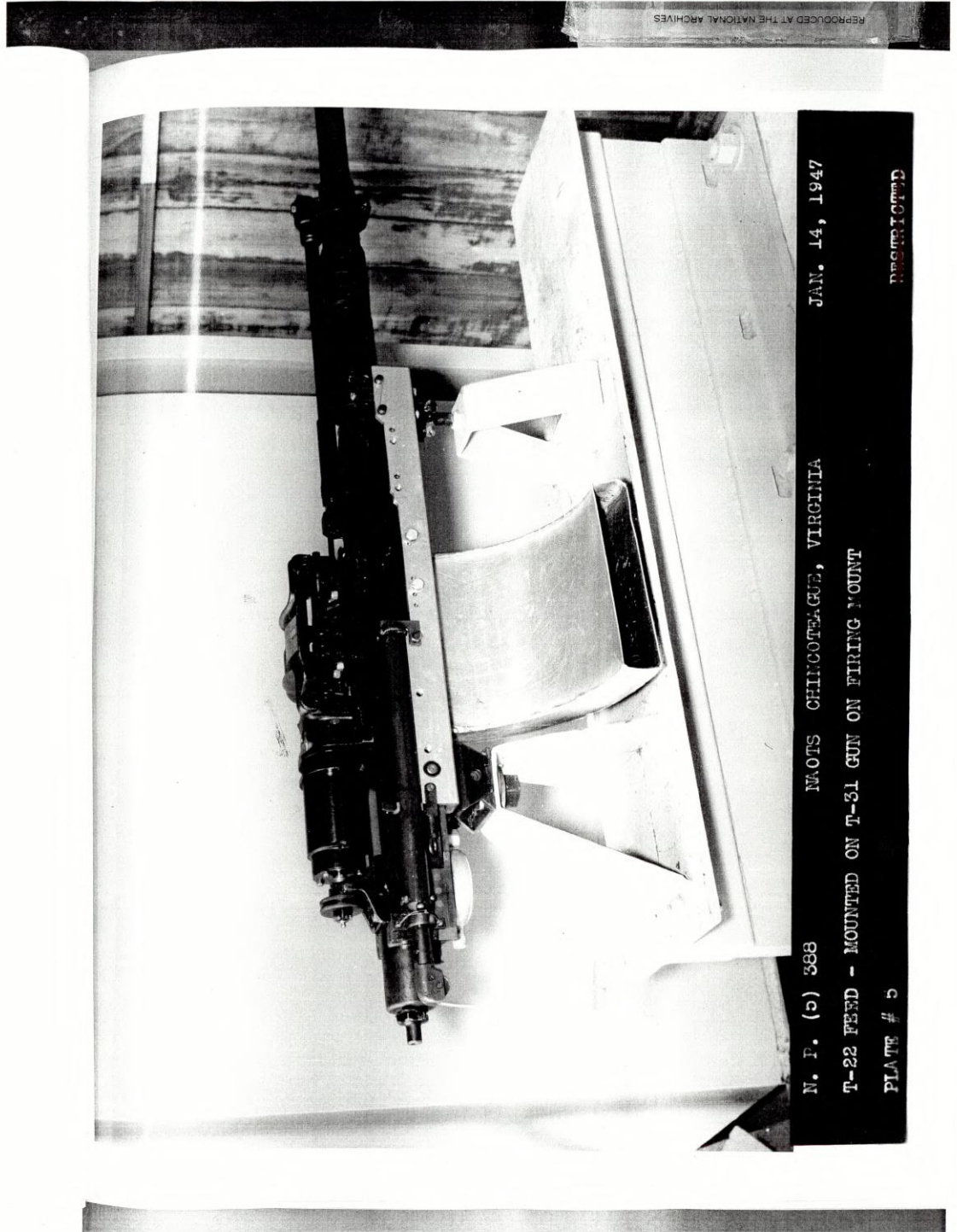
JAN. 14, 1947

WATS CHILCOTE, VIRGINIA

T-22 FEED - MOUNTED ON T-31 GUN ON FIRING MOUNT

PLATE # 5

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JAN. 14, 1947

WATS CHILCOTEA, VIRGINIA

T-22 FEED - MOUNTED ON T-31 GUN ON FIRING MOUNT

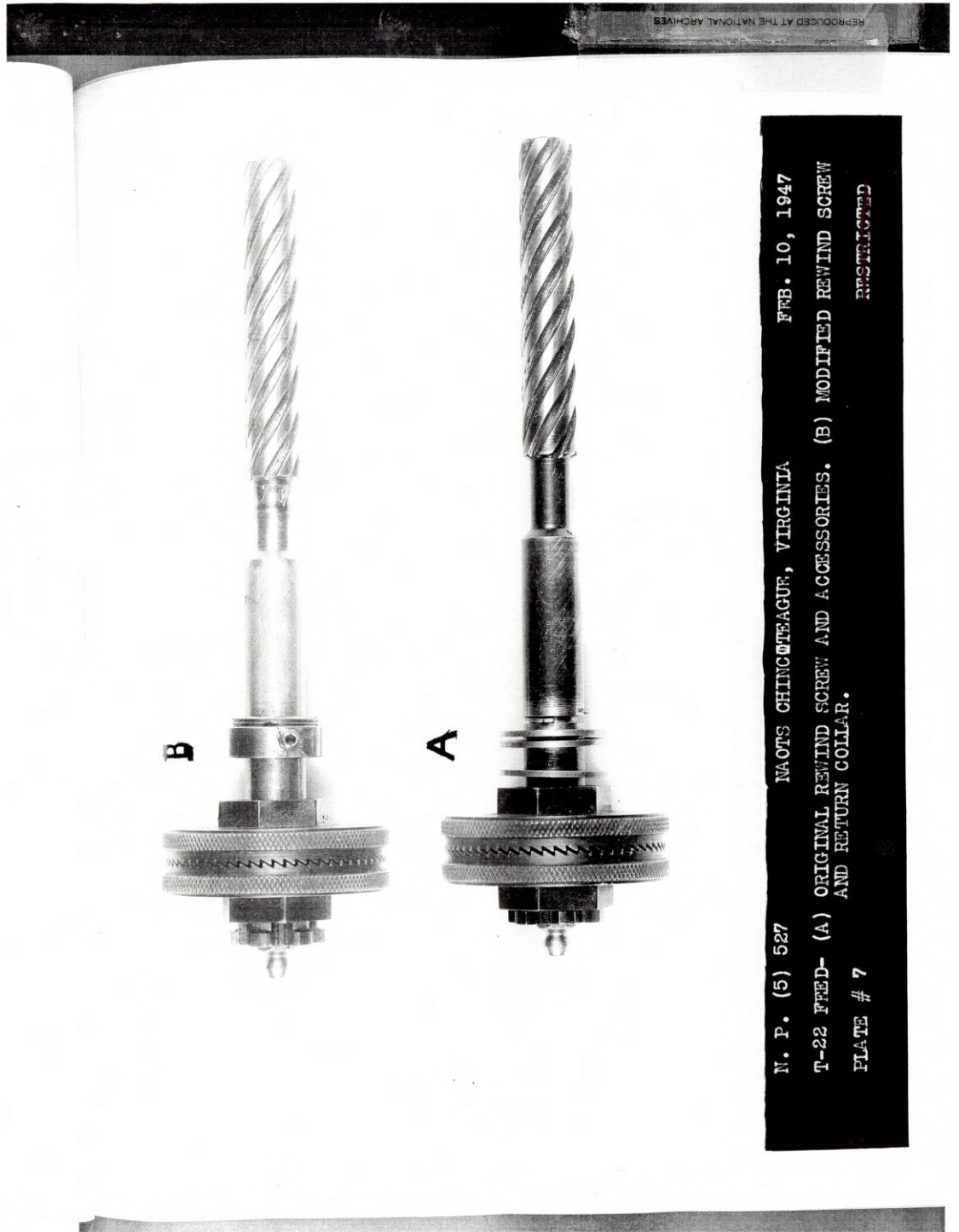
PLATE # 5

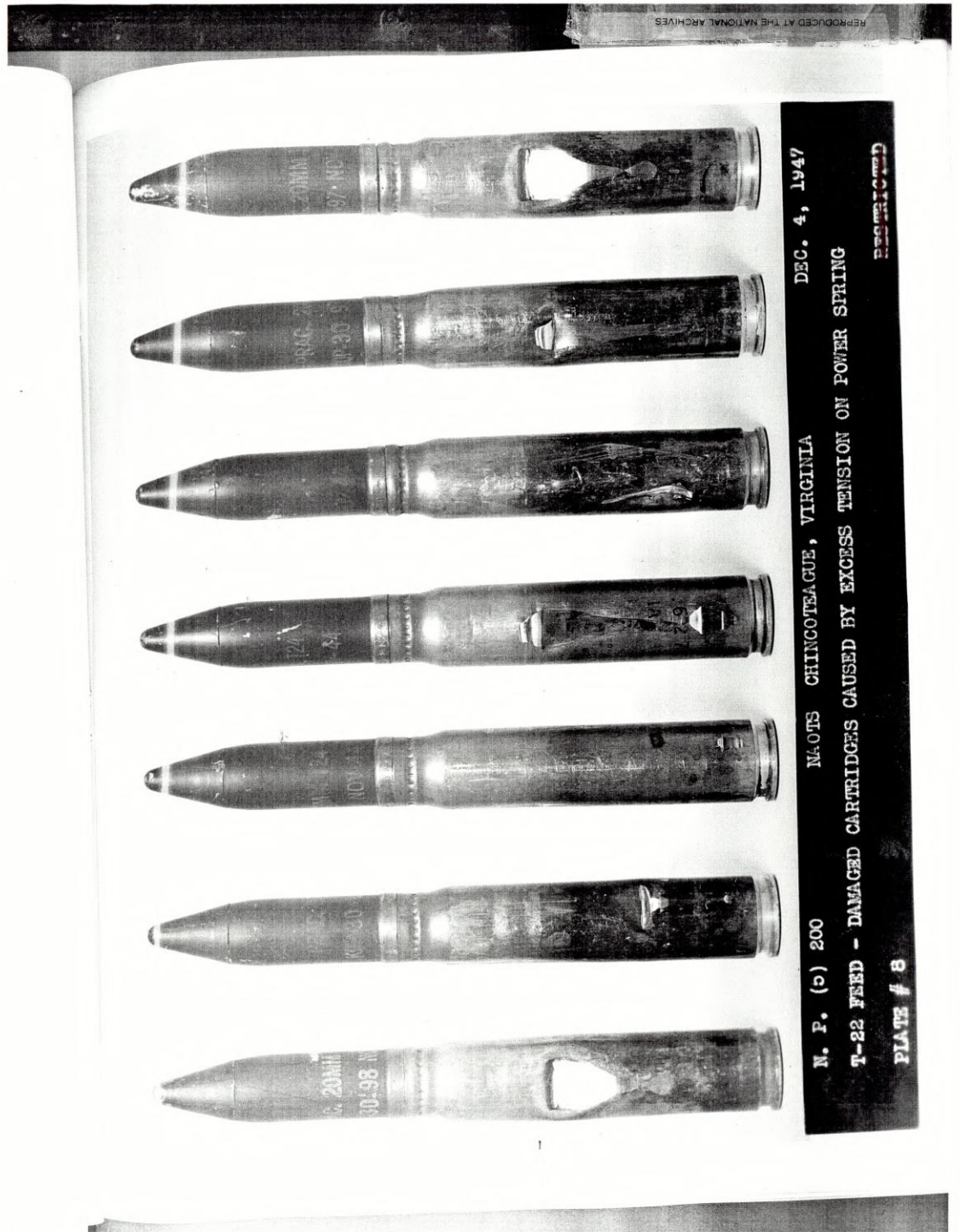
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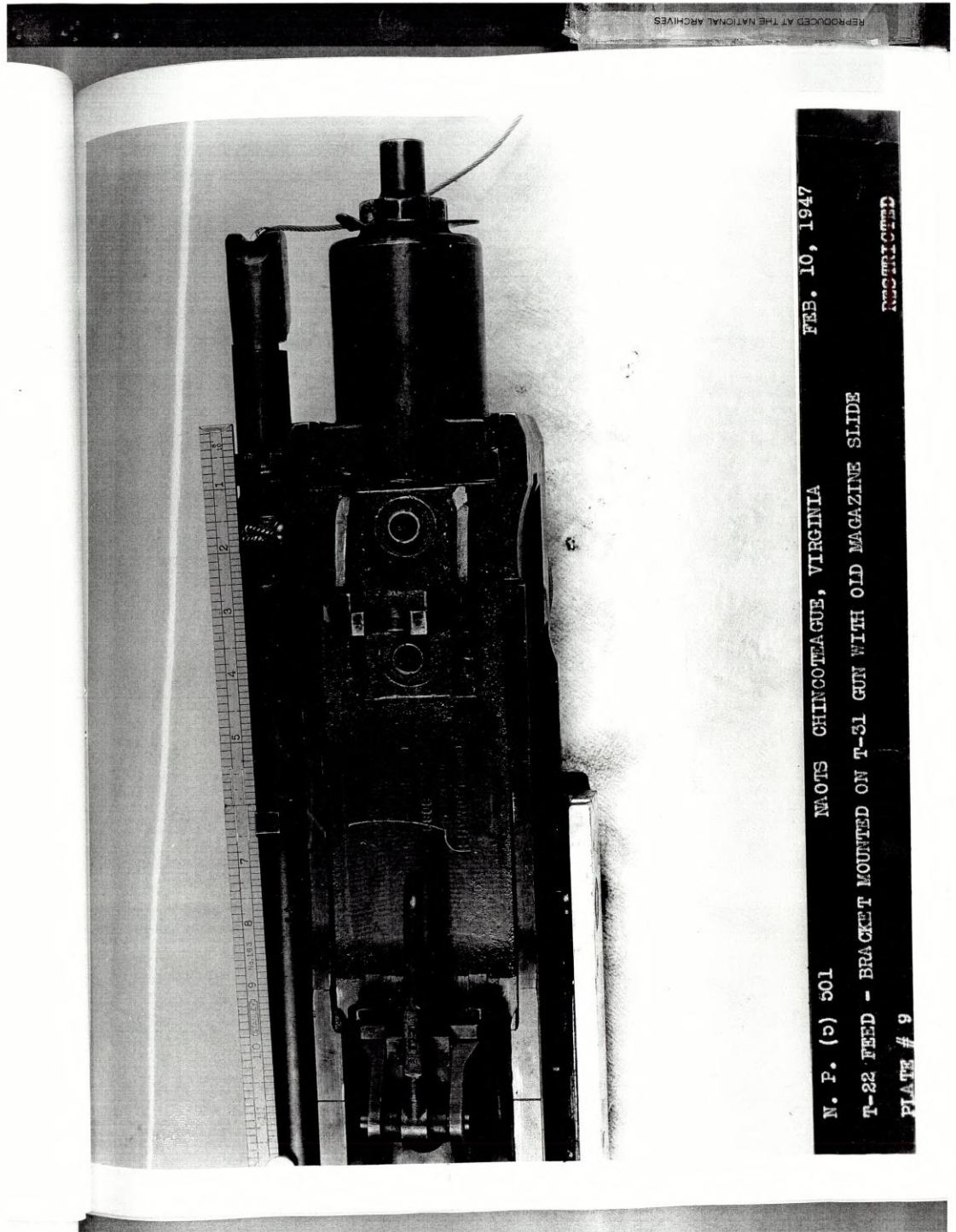
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N. P. (b) 246 NAOTS CHINGOTEAGUE, VIRGINIA DEC. 16, 1947
T-22 FEED - EXPLODED VIEW OF REWIND SCREW SHOWING MODIFIED RETURN COLLAR
PLATE # 6 RESTRICTED







FEB. 10, 1947

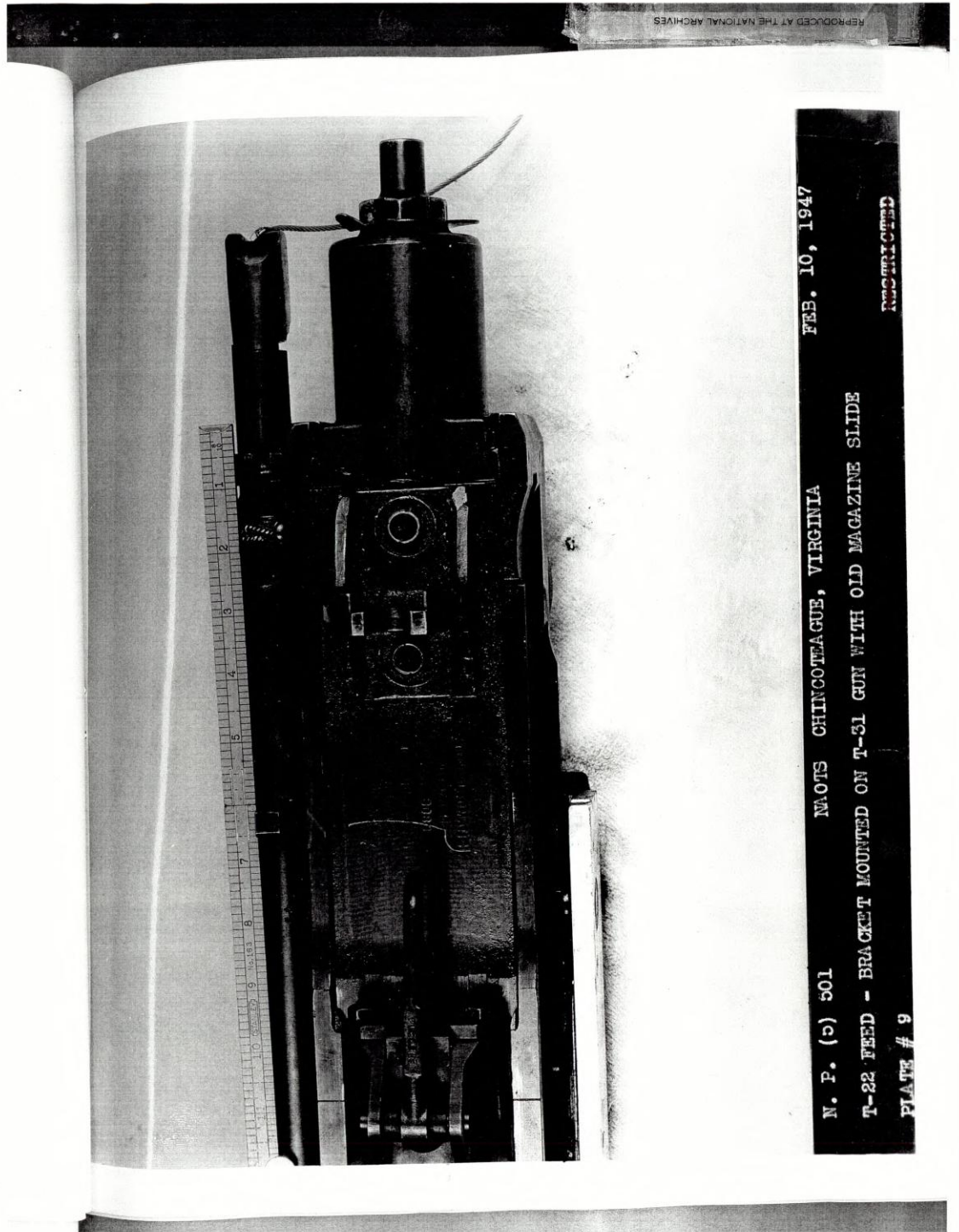
WANTS CHINGOTEAGUS, VIRGINIA

N. P. (v) 501

T-22 FEED - BRACKET MOUNTED ON T-31 GUN WITH OLD MAGAZINE SLIDE

PLATE # 9

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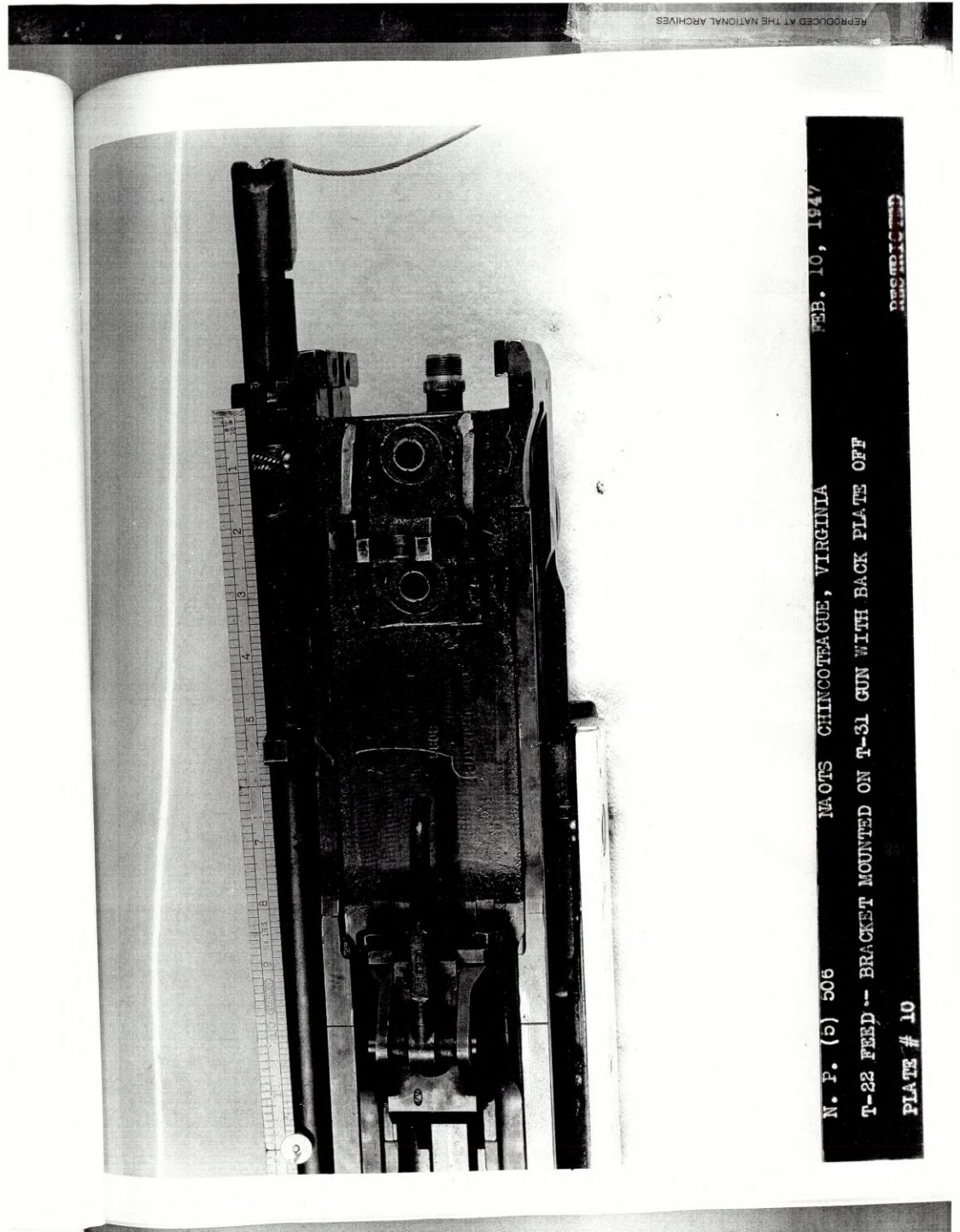
FEB. 10, 1947

WAOTS CHINGO TEAGUS, VIRGINIA

N. P. (v) 501
T-22 FEED - BRACKET MOUNTED ON T-31 GUN WITH OLD MAGAZINE SLIDE

PLATE # 9

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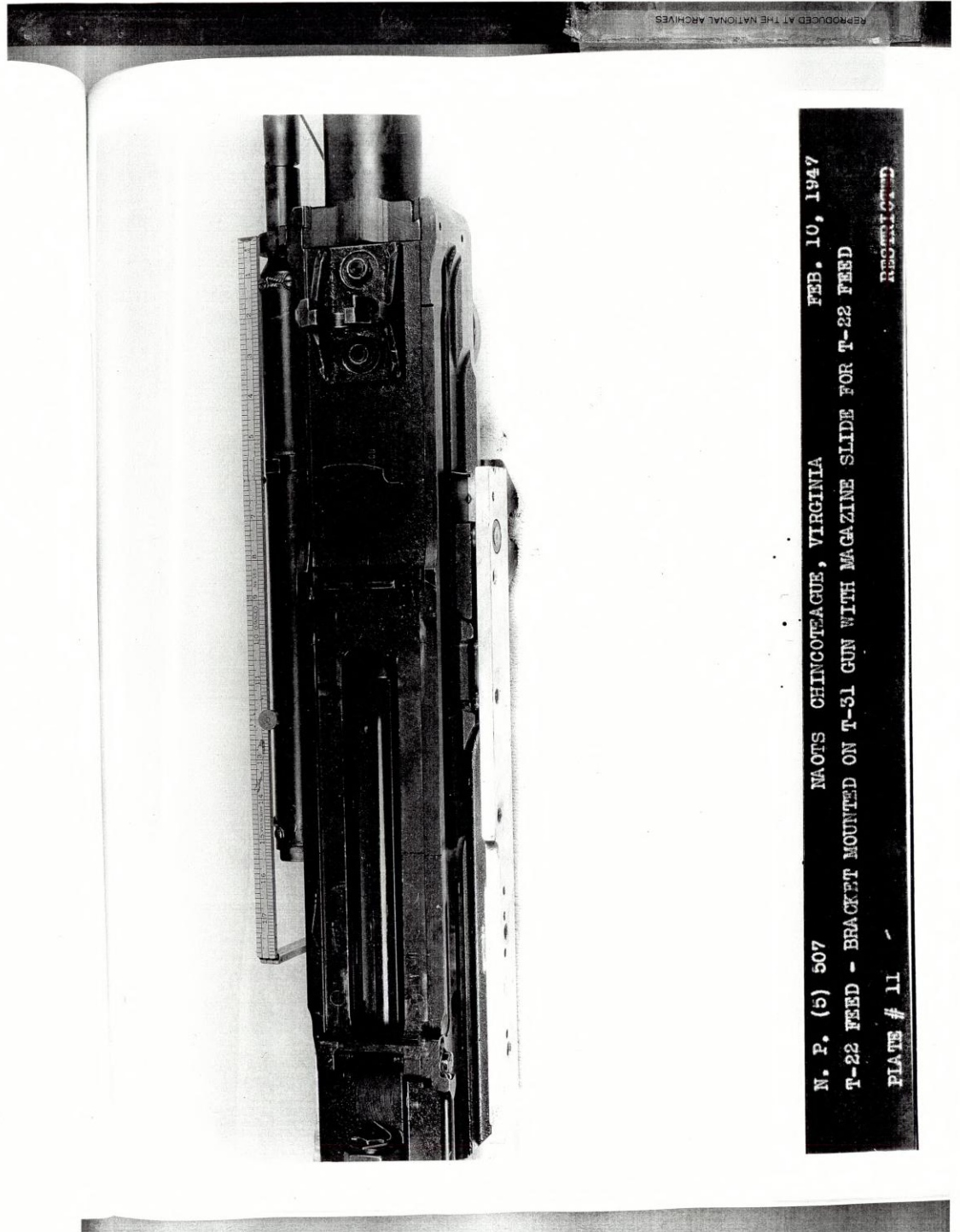
MAOTS CHINCOTEAGUE, VIRGINIA

N. P. (b) 506

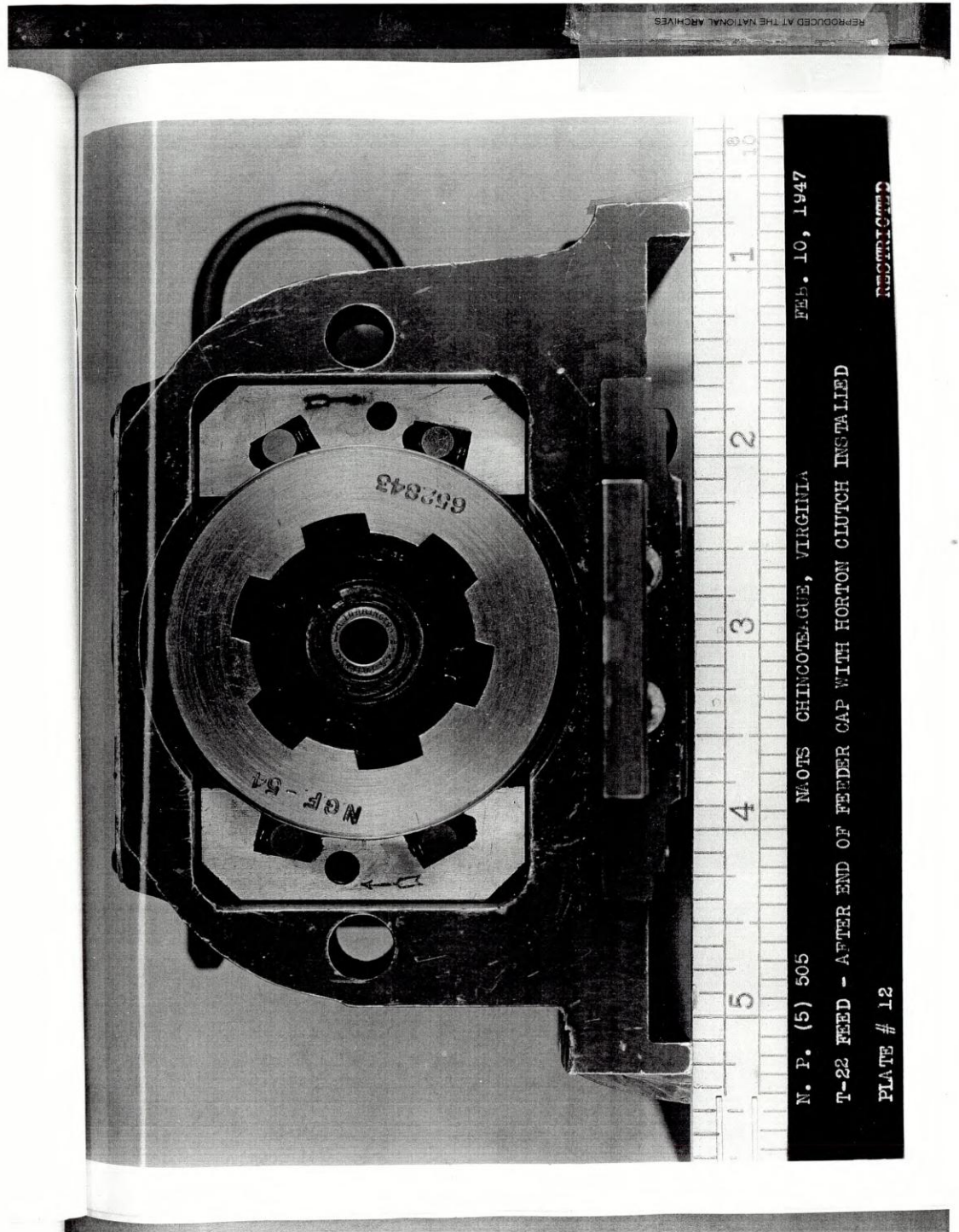
T-22 FEED.-- BRACKET MOUNTED ON T-31 GUN WITH BACK PLATE OFF

PLATE # 10

PHOTOGRAPHED



N. P. (b) 507 NAOTS CHINCOTEAGUE, VIRGINIA FEB. 10, 1947
T-22 FEED - BRACKET MOUNTED ON T-31 GUN WITH MAGAZINE SLIDE FOR T-22 FEED
PLATE # 11
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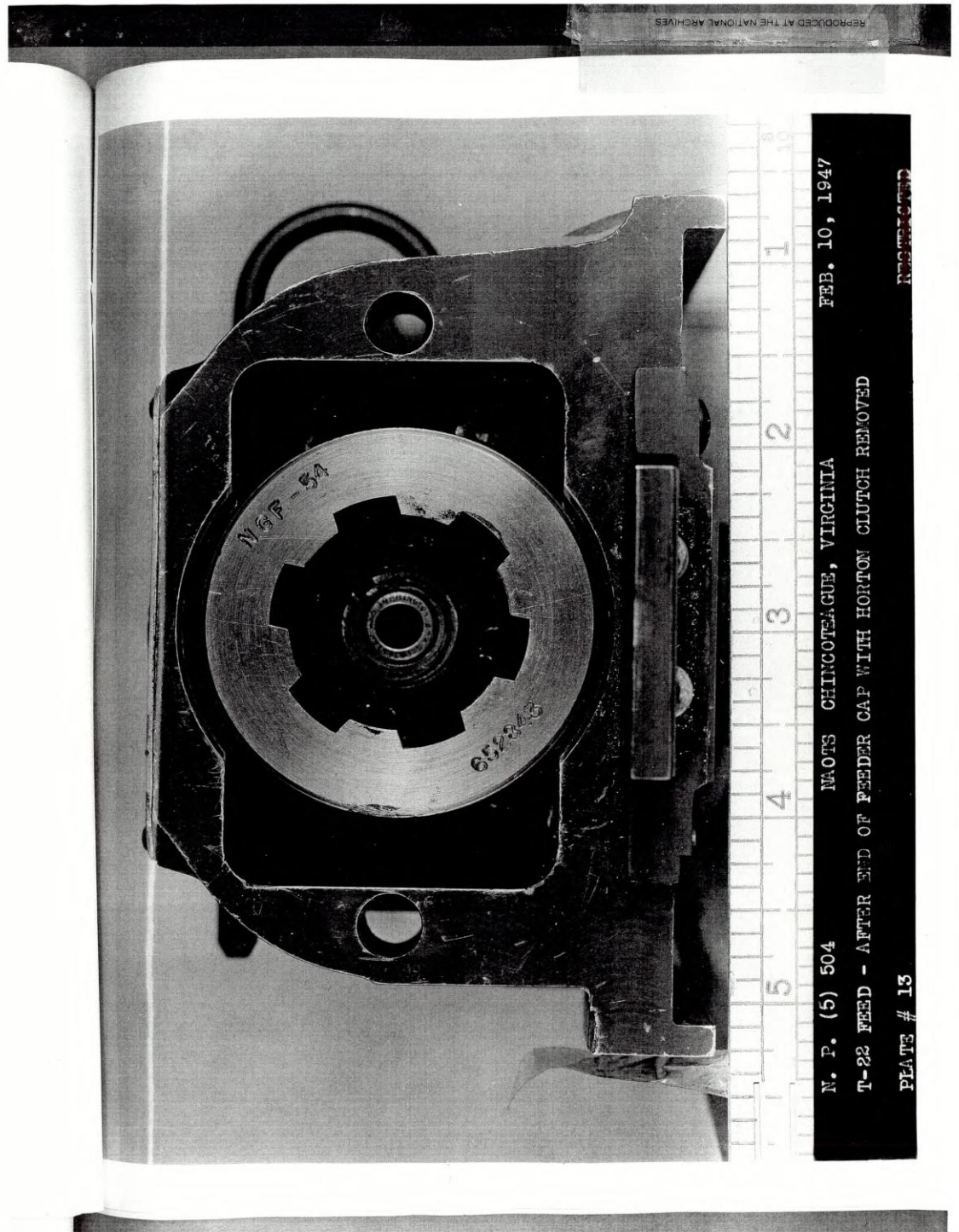
FEB. 10, 1947

MAOTS CHINCOTEAGUE, VIRGINIA

T-22 FEED - AFTER END OF FEEDER CAP WITH HORTON CLUTCH INSTALLED

PLATE # 12

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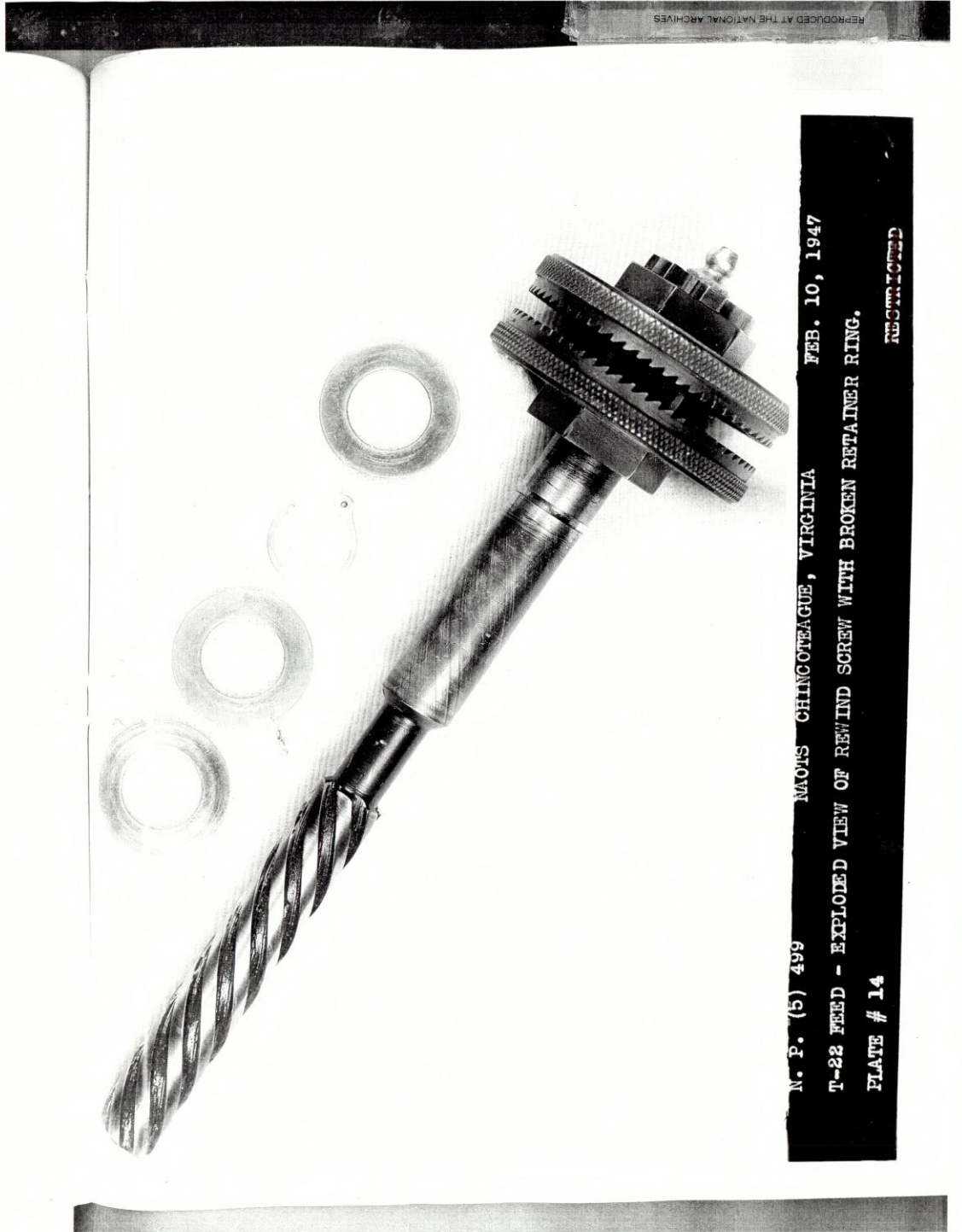
N. P. (5) 504 MAOTS CHINCOTEAGUE, VIRGINIA

FEB. 10, 1947

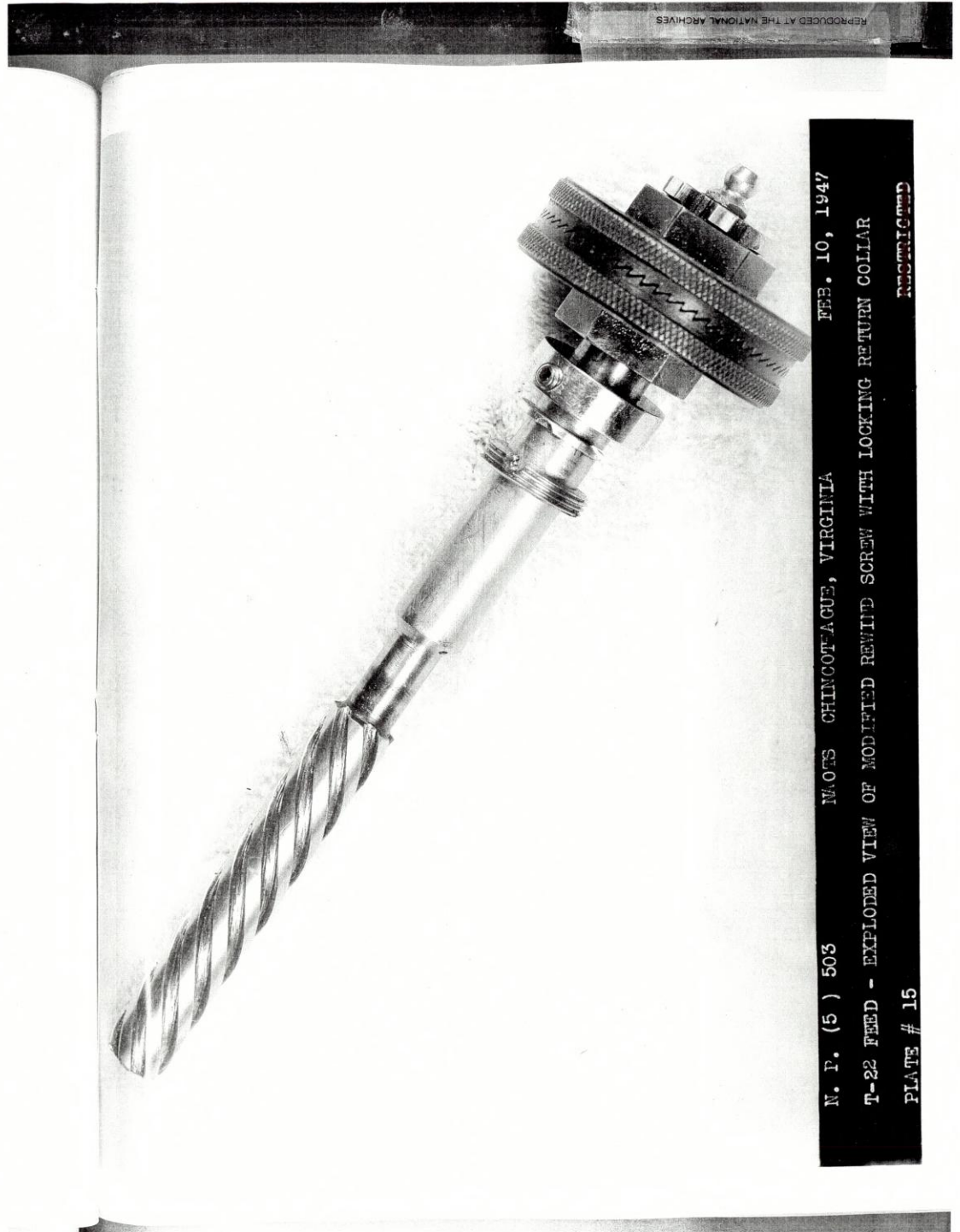
T-22 FEED - AFTER END OF FEEDER CAP WITH HORTON CLUTCH REMOVED

PLATE # 13

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N. P. (5) 499 MAOTS CHINGOCEAGUE, VIRGINIA FEB. 10, 1947
T-22 FEED - EXPLODED VIEW OF REWIND SCREW WITH BROKEN RETAINER RING.
PLATE # 14
RECORDED



FEB. 10, 1947

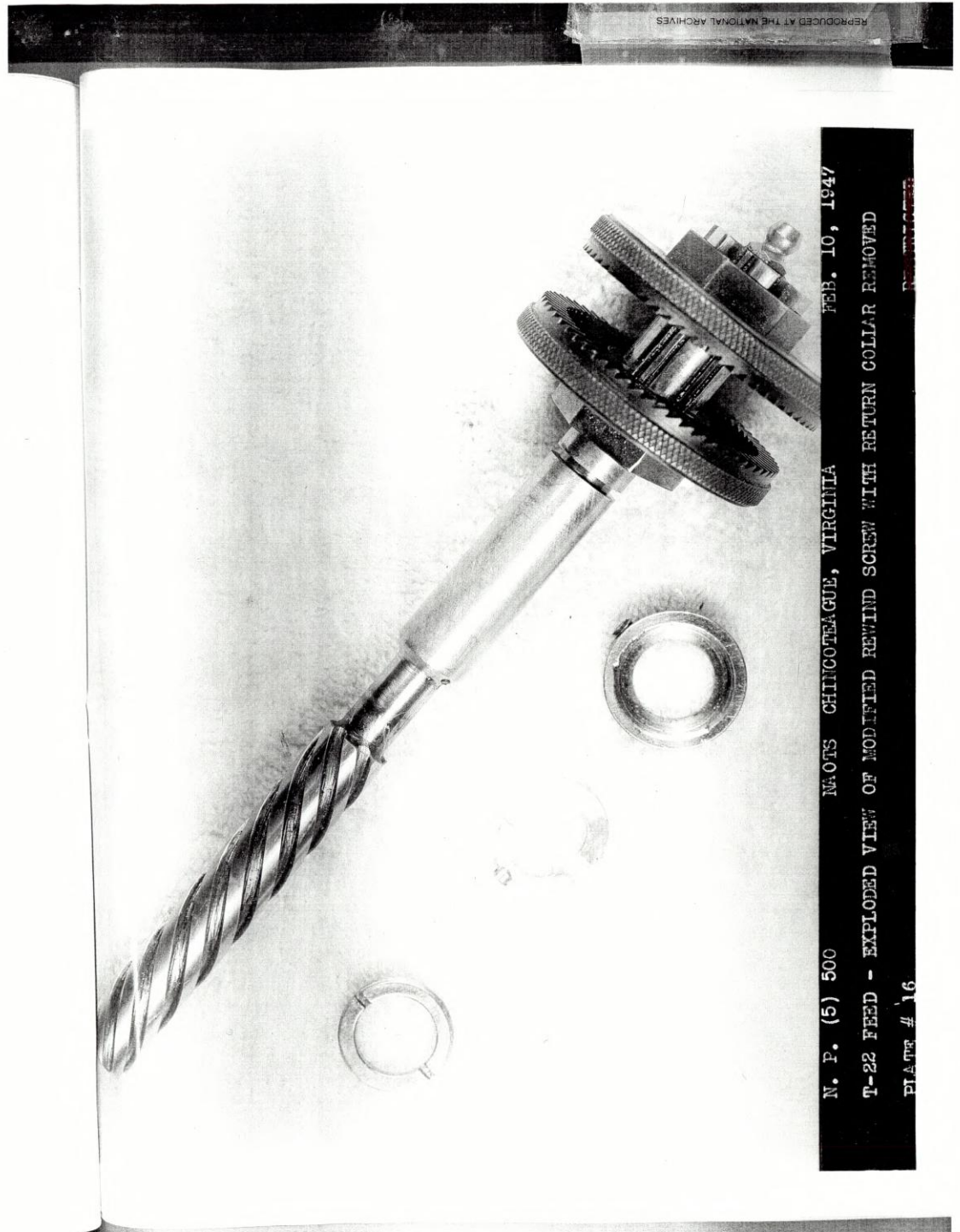
NOTES CHINCOTEAGUE, VIRGINIA

N. P. (5) 503

T-22 FEED - EXPLODED VIEW OF MODIFIED REWID SCREW WITH LOCKING RETURN COLLAR

REPRODUCED

PLATE # 15



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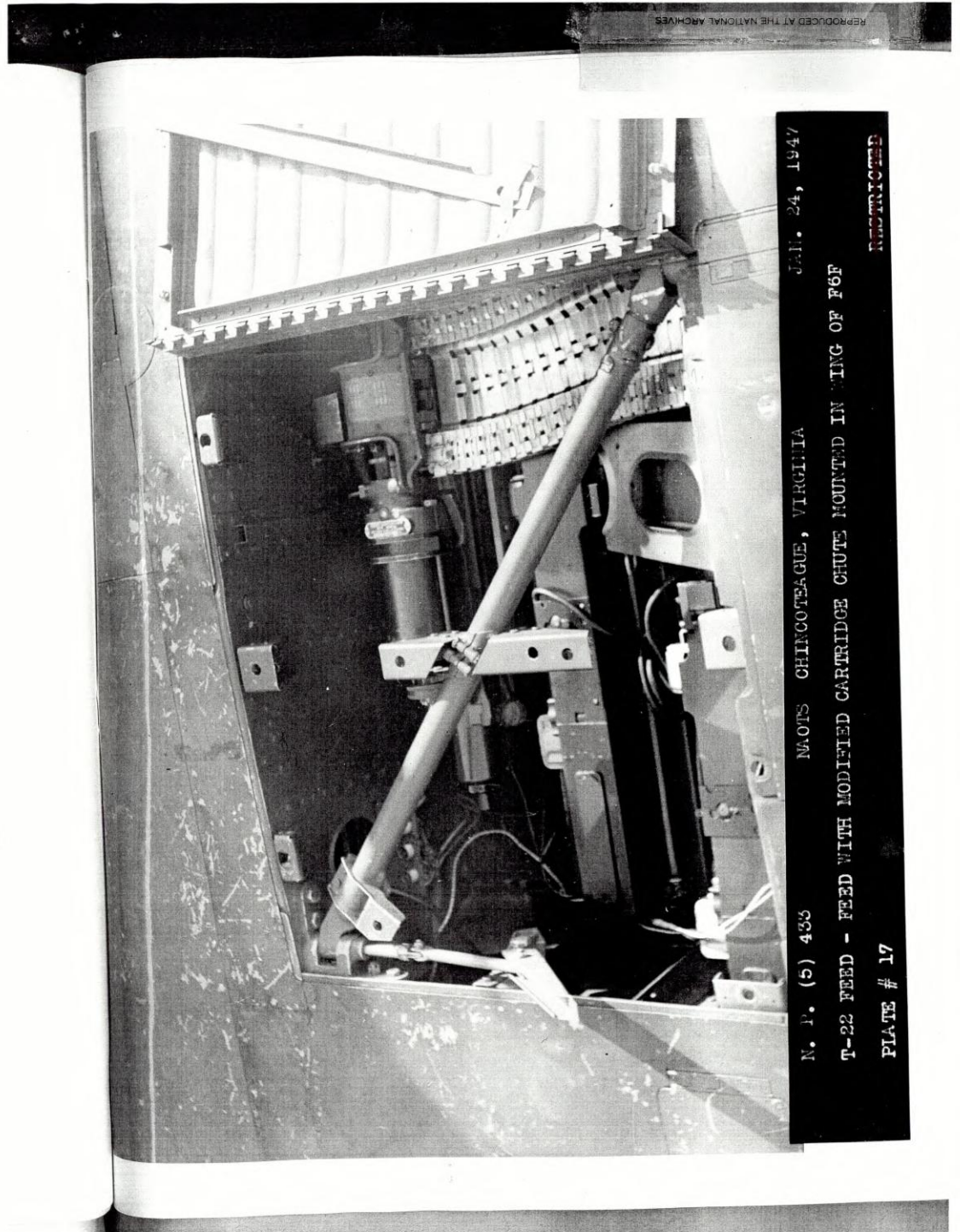
FEB. 10, 1947

M.OTS CHINCOTEAGUE, VIRGINIA

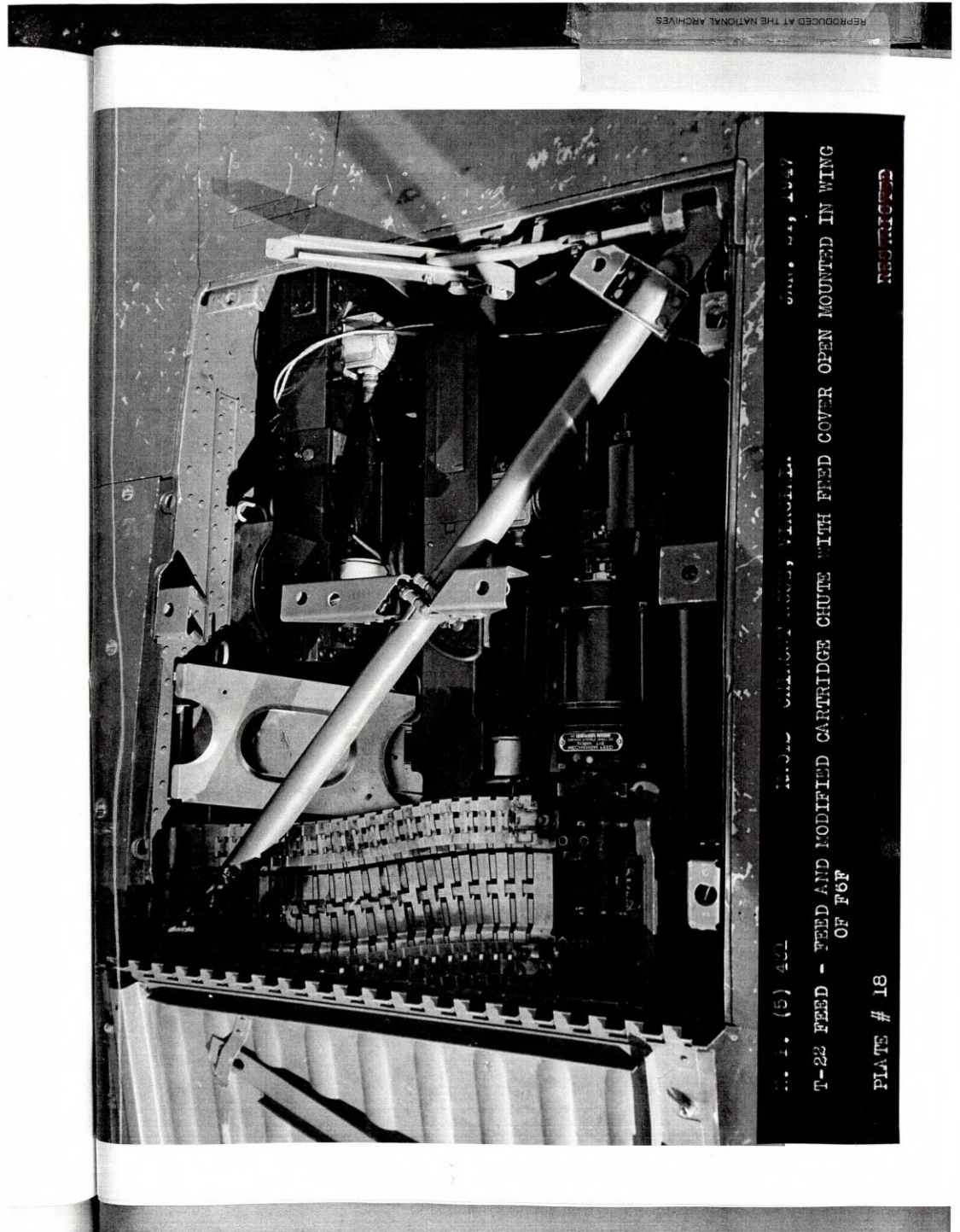
N. P. (5) 500

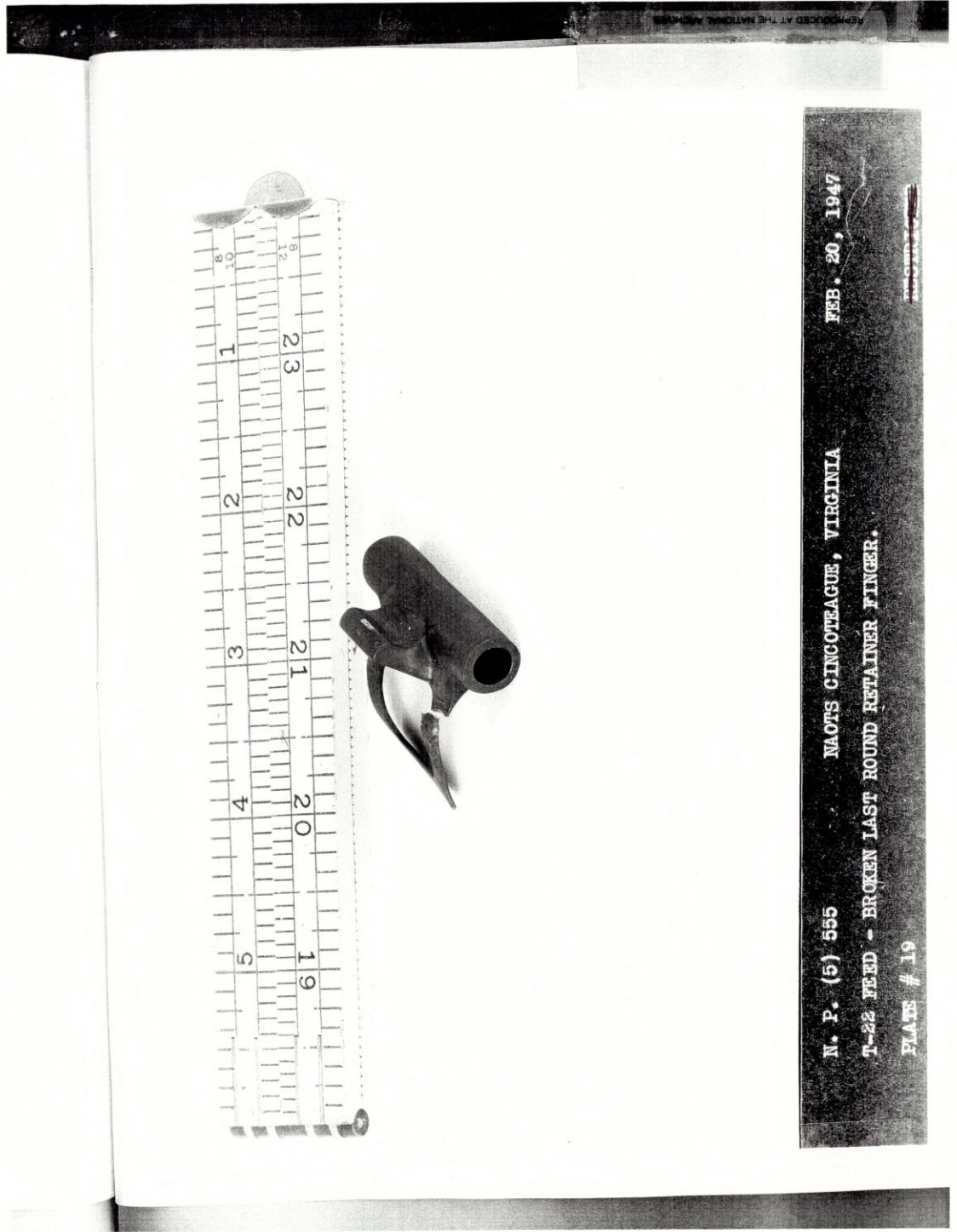
T-22 FEED - EXPLODED VIEW OF MODIFIED REWIND SCREW WITH RETURN COLLAR REMOVED

PLATE # 16



N. P. (5) 433 MAOTS CHINCOTEAGUE, VIRGLIA JAN. 24, 1947
T-22 FEED - FEED WITH MODIFIED CARTRIDGE CHUTE MOUNTED IN LING OF P6F
PLATE # 17
RESTRICTED





FEB. 20, 1947

NAOVS CINCOTEAGUE, VIRGINIA

N. P. (5) 555

T-22 FEED - BROKEN LAST ROUND RETAINER FINGER.

PLATE # 19

THE CENTER FOR
THE HISTORY OF THE
MILITARY

W-2 Chief, Bureau of Aeronautics.

1953 NAAS/NOTS Chincoteague, VA Ammunition Storage, Evaluation of,
dated 29 December. Record Group 74; Entry 1005; Box 24; File NA111;
National Archives, College Park, MD.

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Aer-SE-43

29 DEC 1958

019983

~~CONFIDENTIAL~~
FIRST ENDORSEMENT on NAAS & NAOTS Chincoteague Ltr (conf) ML-9(2)/
NAOTS (ON24:GDG:jg) H6 serial 0330 of 18 Nov 1953, w/encl

From: Chief, Bureau of Aeronautics
To: Chief, Bureau of Ordnance

Subj: NAAS/NAOTS Chincoteague, Va., Ammunition storage; evaluation
of

1. Readdressed and forwarded.
2. It is noted that the application of the standards prescribed in reference (a) will result in a reduction of magazine capacity of about 45 percent. This would have little effect on present storage requirements; however, it would seriously affect capabilities to support additional squadrons.
3. In view of this reduction in ammunition capacity, it is requested that the basic evaluation be reviewed and consideration be given to granting such waivers as may be necessary in order to maintain storage potential consistent with foreseeable future needs at the subject station.

Copy to:
CNO
COMFIVE
CO, Chincoteague

J. G. [Signature]

DECLASSIFIED
E.O. 12958, Sec. 3.3
NW 26608
By HRM/MMM Date 10/20/05

123153 9119

3129705

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IN REPLY NI-9(2)/NAOTS U. S. NAVAL AUXILIARY AIR STATION
REFER TO (024:GDG:jg) AND
Address N6 U. S. NAVAL AVIATION ORDNANCE TEST STATION
Commanding Officer 0330 Chincoteague, Virginia

18 NOV 1953

~~CONFIDENTIAL~~
~~SECURITY INFORMATION~~

From: Commanding Officer
To: Chief, Bureau of Aeronautics
Subj: Ammunition storage; evaluation of
Ref: (a) OPNAVINST 8010.6 of 10 Oct 1953

Encl: (1) Evaluation of magazine storage, NAAS/NAOTS, Chincoteague, Va.

1. Reference (a) directs the commanding officers of air facilities within the continental limits of the United States to evaluate the effect of the application of standards prescribed in reference (a) upon storage of ammunition within their commands. Enclosure (1) is a chart evaluating the effect of the safety standards.

2. The following recommendations for compliance are hereby submitted:

a. That acceptance of lesser distance to the aircraft runways from magazines 2XT1 and 2XT7 be accepted as a reasonable military operational risk due to the small amounts of high explosives stored therein.

b. That bombs stored in 3XT2 be moved to 3YT4, which is presently used for pyrotechnics, and the pyrotechnics moved from 3YT4 to 3XT2 to comply with instructions contained in paragraph 4 of reference (a).

3. Upon application of the safety standards prescribed in reference (a), the capacity of the high-explosive magazines at this station would be reduced from 858,000 lbs. to 463,000 lbs., for a loss of 395,000 lbs. or about 45 per cent. The result of this reduction in magazine capacity would have little effect on present storages if the recommendations of paragraph (3) above are approved; but this reduction of magazine capacity would seriously affect existing magazine capability to support additional fleet squadrons or squadrons of types other than those presently supported.

Copy to:
CNO (with encl (1))
BUORD (with encl (1))
COMFIVE (with encl (1))

P. W. Jackson
P. W. JACKSON
Acting

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NASA - WFF Test Cell
 Focused Archive Search Report
 Accomack County, Virginia

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SECURITY INFORMATION

EVALUATION OF MAGAZINE STORAGE, NASAS/NOTS CHINCOTEAGUE, VA. 123153 9119

1. Station building number	2. Assigned Magazine number	3. Material presently stored in Station Magazines	4. Current capacity approved by BORD	5. Nearest distance of magazines from runways or their extension	6. Maximum magazine capacity computed from OPNAVINST 8010.6	7. Loss in magazine capacity * (note)
M-2	2XT1	Ruzes	630 cu. ft.	550 ft.	nil	630 cu. ft.
M-3	2YC2	Small Arms ammunition	5,000 cu. ft.	650 ft.	nil	5,000 cu. ft.
M-4	2YC3	Pyrotechnics	5,000 cu. ft.	750 ft.	not applicable	none
M-5	2YT4	Small Arms & 20MM T.P.	2,000 cu. ft.	850 ft.	not applicable	none
M-6	2YG5	Water activated pyrotechnics	630 cu. ft.	850 ft.	630 cu. ft.	none
M-7	2XT6	Primers and Detonators	630 cu. ft.	750 ft.	630 cu. ft.	none
M-8	2XT7	Demolition Outfit, 128 lb. TNT blocks	630 cu. ft.	600 ft.	nil	630 cu. ft.
M-9	3XT1	Rocket Motors	5,000 cu. ft. or 143,000 lbs.	1,250 ft.	70,000 lbs.	73,000 lbs.
M-10	3XT2	GP bombs: (NVT Loaded)	5,000 cu. ft. or 143,000 lbs.	1,250 ft.	70,000 lbs.	73,000 lbs.
M-11	3YT3	WP Ignitors	5,000 cu. ft. or 143,000 lbs.	1,250 ft.	70,000 lbs.	73,000 lbs.
M-12	3YT4	Pyrotechnics	5,000 cu. ft. or 143,000 lbs.	1,750 ft.	173,000 lbs.	none
M-13	3XT5	20MM ammunition and Fragmentation Grenades	5,000 cu. ft. or 143,000 lbs.	1,350 ft.	90,000 lbs.	53,000 lbs.
M-14	3XT6	Jato Units	5,000 cu. ft. or 143,000 lbs.	860 ft.	20,000 lbs.	123,000 lbs.
J-11	4YCI	20MM T.P. rounds	2,000 rounds or 2 days supply for the test cell	1,225 ft.	65,000 lbs.	none
W-83	5YCI	Smokeless Powder (bulk)	4,000 lbs.	Not applicable	magazine located on Wallops Island.	
-84	5XC2	20MM ammunition	10,000 lbs.	Not applicable	magazine located on Wallops Island.	

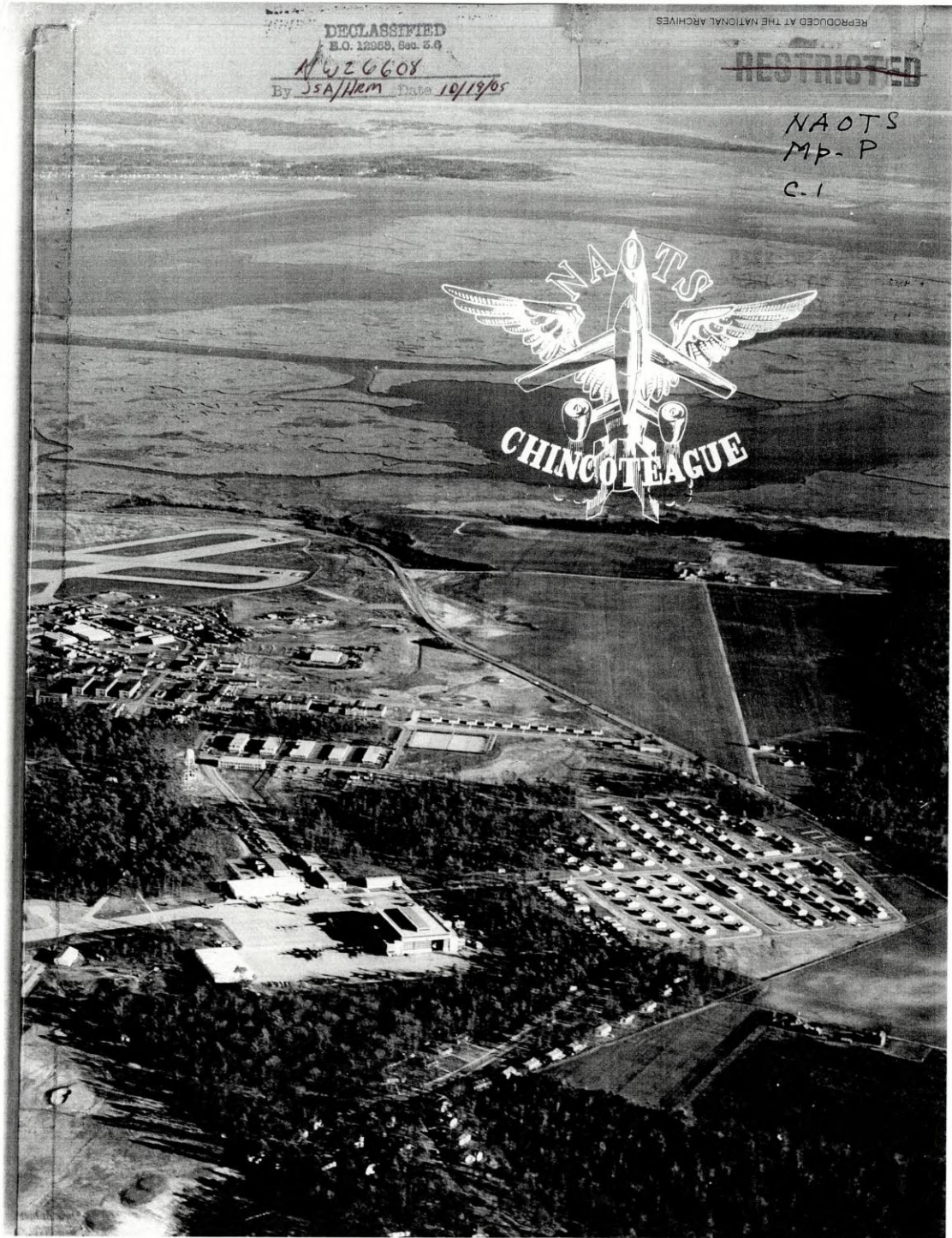
Figures in column 7. are computed by subtracting the figures in column 6. from column 4.

Total loss in magazine capacity: 6,260 cu. ft. & 393,000 lbs.

ENCLOSURE (1)

W-3 Chief of the Bureau of Ordnance.

1950 Inspection of Station Facilities dated 10 March. Record Group 74, Box 865, National Archives, College Park, MD.



☆☆ *Program* ☆☆
Inspection of Station Facilities
by
CHIEF OF THE BUREAU OF ORDNANCE

10 MARCH, 1950

SCHEDULE OF EVENTS

0730	Depart Anacostia - fly over Bullseye Range
0900	Arrive Chincoteague - orientation in Conference Room
0930	Tour of NAOTS test area
1010	Tour of NAOTS station area
1030	End of station tour - proceed to lunch
1100	Lunch
1200	Proceed to Test Cell
1230	Embark for Wallops Island
1315	Arrive Wallops Island - proceed to Mk 37 - Mk 25
1330	Demonstrate tracking of bomb drop
1400	Proceed to Station G-2 - demonstrate rocket tracking
1410	Tour of beach instrumentation stations
1430	Proceed to maintenance area
1500	Proceed to boat landing
1515	Embark for return to Station
1600	Embark for return flight to Anacostia

~~RESTRICTED~~

GEOGRAPHICAL AND HISTORICAL RESUME OF THE U.S. NAVAL AVIATION ORDNANCE TEST STATION CHINCOTEAGUE, VA.

The Naval Aviation Ordnance Test Station, Chincoteague, Virginia, is located on the Eastern Shore of Virginia approximately 87 air miles northeast of Norfolk, Virginia, and 104 air miles southeast of Washington, D. C. Bordered on the south by State Highway #175, it is 5 miles east on that route from National Highway #13, one of the primary coastal arteries to the South. The Pennsylvania Railroad, with a siding and facilities for unloading, is within 6 miles of the Station. Small craft provide transportation to the Wallops Island Range and also crash and rescue facilities.

When originally commissioned on 5 March 1943, the Station was designated Naval Auxiliary Air Station and intended as a temporary operating base for carrier air groups under training. For the first three years of its existence, the Station fulfilled this mission, and, on two occasions, when no carrier groups were present, it supported heavy land-based patrol bomber squadrons (PB4Y's) undergoing final training before assignment to overseas bases.

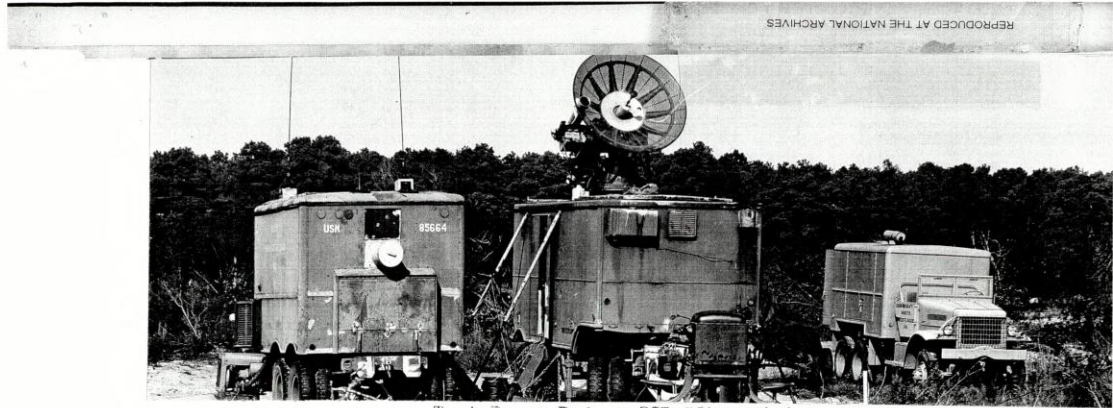
In the fall of 1943, the need for a suitable East coast test station with adequate aircraft facilities and test range areas was recognized by the Bureau of Ordnance. A board of officers, convened by the Chief of the Bureau of Ordnance, made a study of several locations along the East coast for the purpose of determining the most desirable place to establish an aviation ordnance testing activity. As a result of this investigation, Chincoteague was selected. It was also recommended, at that time, that the proposed Station share facilities with the Naval Auxiliary Air Station to the greatest extent possible and the combined station be under the command of an officer whose background in aviation ordnance would be sufficient to properly direct and administer the special function of the proposed enlarged station.

In March, 1945, with the approval by the Secretary of the Navy, the Naval Aviation Ordnance Test Station was established at Chincoteague, and construction commenced on the extension of facilities. Expenditure of Bureau of Ordnance funds was approved for the erection of a hangar, shops, and storage facilities, and for the leasing of additional land (Wallops Island) for the extension of range facilities. By early 1946, sufficient work had been completed, personnel assigned, and aircraft procured to commence limited operations. The Station was formally commissioned on 15 April 1946.

It is significant to note that, shortly before the commissioning of the new activity, positive steps were taken to establish it as the sole guided missile test facility on the East coast. A request to this effect was addressed to the Chief of Naval Operations by the Chief of the Bureau of Ordnance on 25 February 1946.

Because of its unique location, Chincoteague was early recognized as having distinct advantages over other East coast facilities for the conduct of experimental and development work on fire control devices, aviation ordnance and guided missiles. With an excellent airfield of two 5,000-foot and one 6,000-foot concrete runways, it is readily accessible to extensive sea ranges where maximum safety and security in conducting tests can be ensured. Air approaches to the field are excellent and over sparsely populated areas, minimizing danger to life and property. Besides having the nearby ocean for testing water-type missiles, surrounding marshlands hold excellent possibilities for necessary ground ranges and has been used in this respect. The Station is convenient to Washington and to the agencies responsible for missile development programs.

Today, with most of its organizational and training problems overcome, the Station is able to concentrate its full efforts toward the conduct of the research, testing, and development tasks assigned it by the Bureau of Ordnance.



Test Range Radar, SCR-584 Modified

Wallops Island Range

Wallops Island is located approximately 5 miles south of the Station. It is $1\frac{1}{2}$ miles wide and 5 miles long and extends in a northeast-southwest direction. The range is equipped to furnish trajectory and attitude data for ground-launched missiles of all types. Coverage includes synchronized data from phototheodolites, fixed cameras, radar, and raydist.

Adequate instrumentation is also available for the evaluation of fire control equipment developed for toss bombing, dive bombing, high altitude bombing, radar offset bombing, and high altitude strafing.

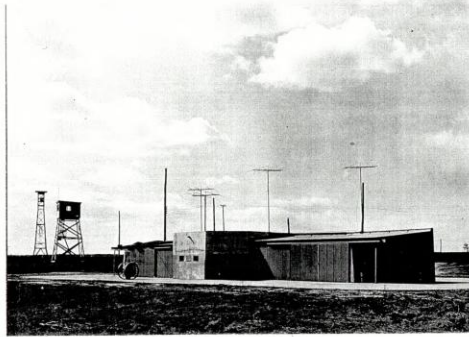
Modified Mk 51 Gun Director Used As
Phototheodolite on Grebe Range



Mk 37 Control Director



Test Cell

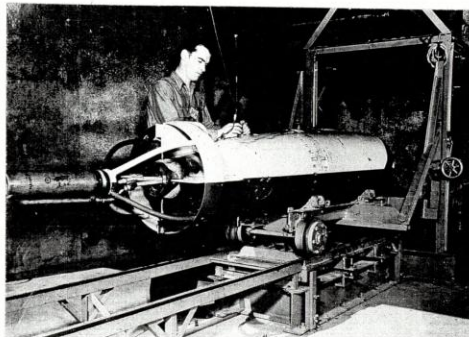


Test Cell

The Test Cell, located east of the airfield and adjacent to U. S. Highway No. 175, is constructed of heavy, reinforced concrete walls and comprises two separate sections. One section is used for the static testing of the various types of jet engines used to power guided missiles.

An instrumented test stand provides a means of determining engine performance. The other section is utilized in the conduct of ground fire tests of aircraft machine guns and rockets projectors. The marsh area in front of the cell provides an ideal unobstructed overland range.

Jet Engine Thrust Stand



Strain Gage Equipment

Bullseye Range

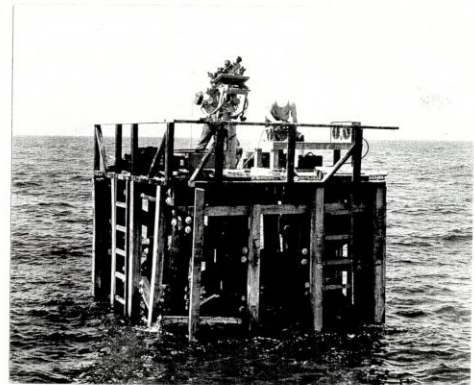


F-56 Camera Cluster Now Used at Bullseye
for Dove Project

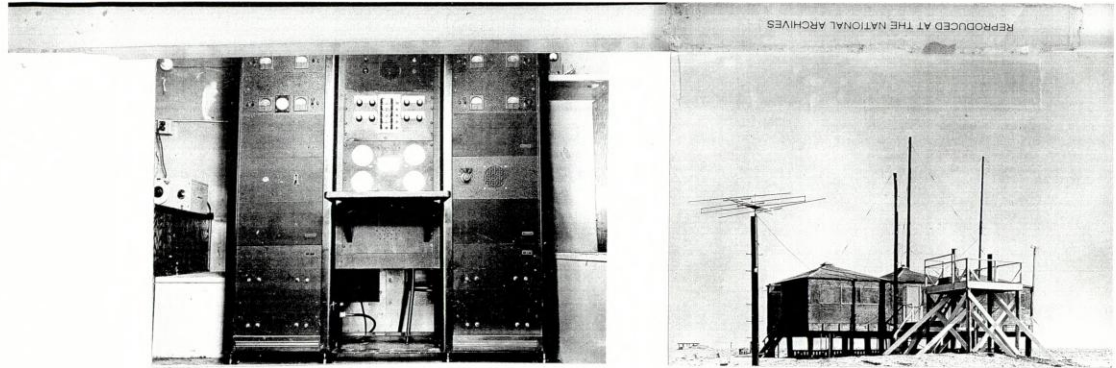
The Bullseye Range, located on Chesapeake Bay, consists of a grounded Liberty ship and four sea stands located around the ship on a semicircle of 2,500-foot radius. The stands, as well as the ship, are instrumented and interconnected with submarine cable to record trajectory, attitude, water entry, and impact points of missiles launched against this ship target.



Modified Mk 51 Director Used As
Phototheodolite on Sea Stand



Sea Stand at Bullseye Used For
Phototheodolite Tracking Station



Master Station and Associated Equipment

Assateague Raydist Relay Station

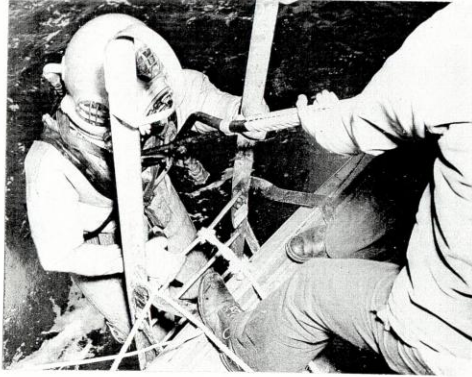
Raydist

The Raydist tracking system may be used to locate and track a boat, plane, missile, or other object in either two or three dimensions. This system uses the phase measurement of electromagnetic standing waves in space to obtain position measurements. In this system, it is necessary that the object being tracked carry a small, battery-operated, unmodulated, C.W. transmitter. The signal from the transmitter is picked up by relay stations located at various surveyed points on the test range and sent to a master station. The master station, which consists of the phase measuring indicators and recording equipment installed in a trailer located in the vicinity of the test range, collects all of the data needed to determine the path or trajectory of the object being tracked.

Raydist Master Station



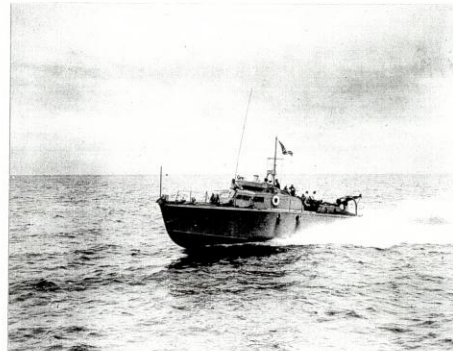
Recovery Facilities



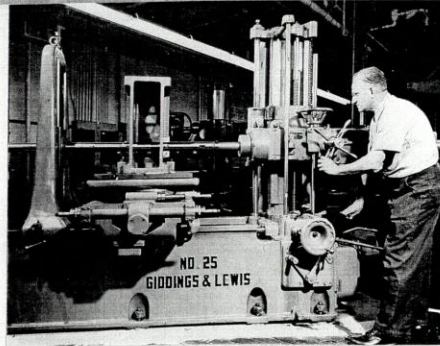
Deep Sea Diving Operation

The Station is equipped with facilities for underwater recovery of all types of missiles. Two ARB (Aircraft Recovery Boats) type boats are in use for recovery operations. One of these craft is used for operations in the Atlantic Ocean, while the other is used for tests conducted in the Chesapeake Bay Area.

An experienced diving crew and equipment are available for all missile drops. Recovery operations are initiated immediately following a drop. Methods and equipment used in these recovery missions are constantly being improved upon.



ARB Recovery Boat

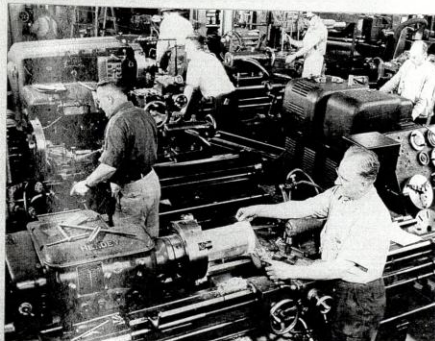


Manufacturing Jig on Boring Mill



Metal Spraying Operation

Metal Spinning Operation on Lathe



Industrial Division

The Industrial Division includes the Machine Shop, Sheetmetal Shop, and Carpenter Shop.

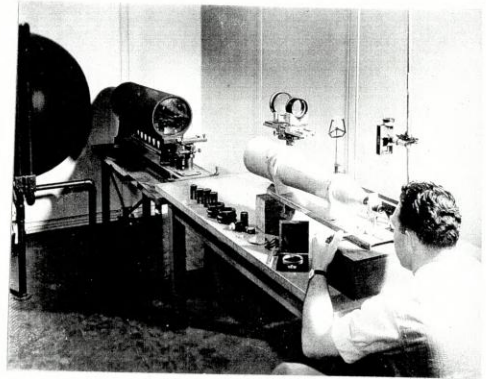
The Machine Shop is equipped with the latest type of machine tools and is capable of turning out any equipment normally required by a test station. In addition to original fabrication, the machine shop repairs equipment and makes special experimental parts.

The Sheetmetal Shop is equipped to weld, cut, bend, and manufacture parts from sheetmetal. Any wood-working requirements of the Station are handled by the Carpenter Shop.

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Instrument and Calibration Laboratory

The Instrument and Calibration Laboratory has a wealth of scientific facilities for calibration, maintenance, and repair of all conceivable types of measuring instruments.

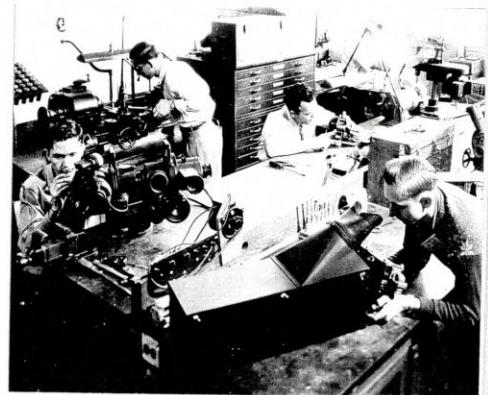


Precision Focal Plane Determination

This laboratory is equipped with the latest types of instrument testing machines, one of which is the Baldwin Tester, capable of measuring compression or tension throughout a range up to 60,000 pounds. A temperature-controlled chamber is available for tests conducted at various pressures and vacua. Equipment is also available for conducting extensive optical, electrical, chemical, temperature, and mechanical measurements and investigations.



Strength of Material Testing

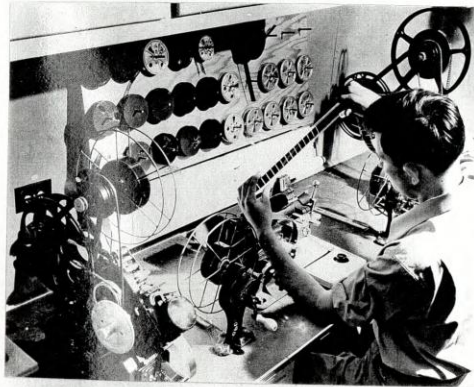


Phototheodolite and Camera Repair

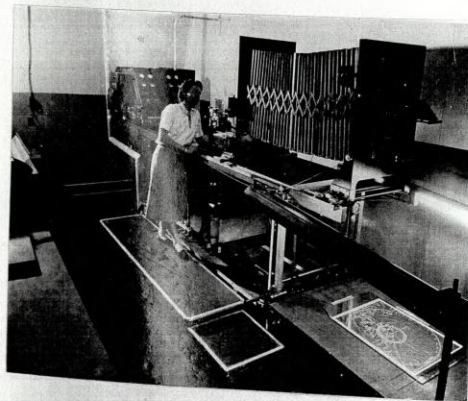
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Photographic Division

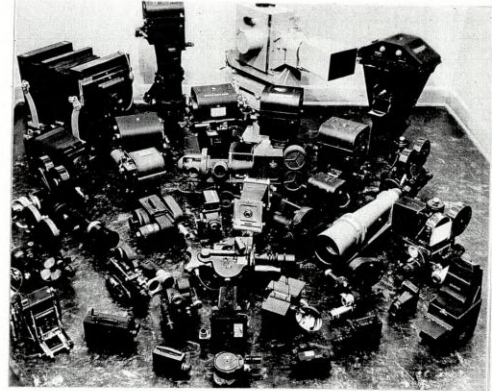
Photography is the most satisfactory method employed for the permanent recording of various ballistic data. The NAOTS Photographic Laboratory is well equipped with more than thirty separate types of cameras, most of which have been modified to meet special requirements. A twenty-room, completely air-conditioned building houses the studio, darkrooms, and automatic processing machines.



Editing of Test Range Film



Photostat Room



Various Cameras Used by Division

The Photographic Division, with a staff of 63 military and civilian personnel, is divided into four sections. The Test Coverage Section installs all aerial and motion picture cameras in planes and operates these equipments when and where required. The Laboratory Section takes still pictures and does processing, printing, and finishing of all stills. The Motion Picture Production Section handles the processing, editing, viewing, printing, duplicating, routing, and projection of all motion pictures.

Average annual production consists of 500,000 feet of black and white and 75,000 feet of color motion picture film; 5,000 aerial and 12,000 still negatives; and over 50,000 glossy prints.

A Photo Field Section operates and maintains the extensive tracking facilities on the Wallops Island and Bullseye Ranges. The equipment consists of phototheodolites, a Mk 37 - Mk 25 Director Radar, Mk 51 Trackers, SCR-584 Radar Units, and Rake Stations.

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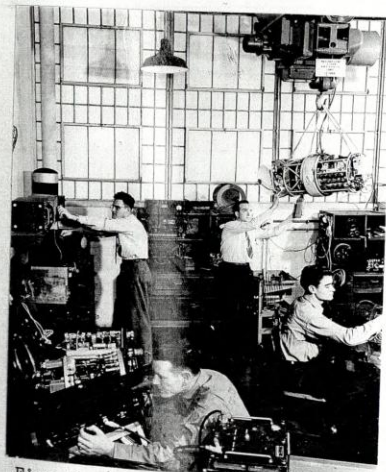
Design and Drafting Section



Design and Drafting Section

It is the function of the Design and Drafting Section to provide services to all departments of the Station in the solution of design problems and the reduction of these problems to working drawings.

Fire Control Laboratories



Fire Control Radar Laboratory

In the Fire Control Laboratories, comprehensive studies of fire control equipment are made to obtain engineering data prior to actual flight tests. In connection with these preflight tests, it is necessary to calibrate and maintain the systems being investigated and also to design, manufacture, and install the auxiliary instruments required to obtain evaluation data.

An important function of these laboratories is to provide working space for manufacturers' representatives on this Station, and to collaborate with them on tests.



Fire Control Laboratory

REPRODUCED AT THE NATIONAL ARCHIVES

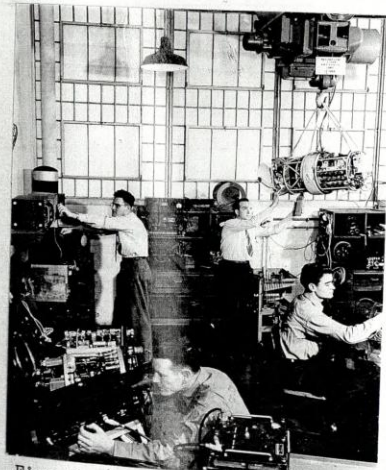
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Fire Control Laboratory

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**GENERAL AND DESCRIPTIVE INFORMATION
 U.S. NAVAL AVIATION ORDNANCE TEST STATION
 CHINCOTEAGUE, VA.**

A. GENERAL

1. Areas.

(a) Land (Acres):

	<u>Dry</u>	<u>Marsh</u>	<u>Total</u>
Inland	1,118.19	250	1,368.19
Easements	2.0		2.0
Leased	<u>201.11</u>	<u>*5352</u>	<u>5,553.11</u>
	1,321.30	5602	6,923.30

*Both marsh and dry.

2. Climatological Data.

(a) Monthly Temperature and Precipitation Averages:

<u>Month</u>	<u>Temperature - Degrees F.</u>	<u>Precipitation - Inches</u>	<u>Snowfall - Inches</u>
August	73.7	7.17	None
September	66.9	4.69	None
October	55.0	1.90	None
November	51.7	6.00	None
December	40.1	2.69	0.20
January	44.7	1.64	Trace
February	45.7	2.95	Trace
March	44.7	2.20	Trace
April	51.8	1.39	None
May	62.6	1.77	None
June	72.7	1.63	None
July	80.7	0.67	None

(b) Prevailing winds - for the summer months, southwesterly, and the winter months, northwesterly.

- (c) Annual snowfall - 1 to 3 inches. Frequency - 3 to 6 days per year.
3. Tides.
- (a) Average high 2.86 feet. Average low 0.3 feet.
4. Datum Plane.
- (a) Elevation 38.0 feet at MLW water.
5. Post Office.
- (a) A branch of the Chincoteague, Virginia, post office on the Station.
6. Telegraph Office.
- (a) Western Union Telegraph offices at Salisbury, Maryland, at Pocomoke City, Maryland, and at Chincoteague, Virginia.
- (b) Incoming telegrams are accepted by the Station Message Center. Outgoing telegrams may be telephoned to one of the above Western Union offices.
- (c) Navy teletype circuit between the Station and the Naval Air Station, Norfolk, Virginia.
7. Radio Facilities.
- (a) Normal airport control frequencies.
- (b) Teletype standby radio circuit to Naval Air Station, Norfolk, Virginia.
- (c) Such air-to-ground, point-to-point, and aircraft communications as necessary for successful completion of assigned mission.
8. Steamship Connections.
- (a) No convenient connections.
9. Airport Connections.
- (a) Nearest commercial airport is at Salisbury, Maryland.
10. Passenger, Baggage, Express, and Freight Services.
- (a) Eastern Shore commercial bus line from Station connects with Greyhound and Red Star Lines.
- (b) Nearest railway siding at Lecato, Virginia.
11. Accommodations (for official visitors).
- (a) 27 double and 6 single rooms in BOQ.

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B. BUILDINGS

1. Floor Areas and Use.

Classification	P. Bldg.	Sq. Ft.	T. Bldg.	Sq. Ft.	Total Bldg.	Total Sq. Ft.
Administration	3	29,278	2	4,284	5	33,562
Personnel	11	142,410			11	142,410
Industrial Shops			17	29,950	17	28,950
Ordnance Shops	3	340	1	800	4	1,140
Inert Stowage			57	81,068	57	81,068
Magazines	10	8,540			10	8,540
Security and Fire	1	5,106	2	852	3	5,958
Pump and Generator	9	7,885	9	2,712	18	10,597
Ordnance Laboratories	1	5,000			1	5,000
Transportation			2	8,812	2	8,812
Medical			2	10,972	2	10,972
Hangars	2	129,895	2	13,025	4	142,920
Miscellaneous	6	15,626	19	36,791	15	52,417
Totals	46	344,080	113	189,266	149	532,346

2. Barracks Capacity.

- (a) Officer and civilian - 90.
- (b) Enlisted - 811.
- (c) Nurses - 6.

3. Family Housing.

Not included in the above list of buildings are the following housing units:

- (a) Officer - six 2-bedroom and forty-one 3-bedroom units.
- (b) Civilian - six 2-bedroom and ten 3-bedroom units.
- (c) Enlisted men - sixty-one 2-bedroom units.
- (d) Low cost - sixty-two 2-bedroom units.

4. Messing Facilities (one sitting).

84 officers or civilians, 290 enlisted men.

C. UTILITIES

1. Water Supply.

- (a) There is no outside water supply to the Station.
- (b) Water is obtained from 10 shallow wells on the Station.
- (c) Total water storage is 450,000 gallons.

(d) Mains:

16-inch - 250 feet
14-inch - 2,800 feet
12-inch - 700 feet
10-inch - 1,200 feet
8-inch - 900 feet
6-inch - 21,600 feet
4-inch - 2,600 feet
3-inch - 1,100 feet

(e) Pumps - two with a pumping rate of 2,500 gallons per minute and one 750 gallons per minute.

2. Sewage Disposal.

(a) Two plants; one 2,000-person capacity and one 500-person capacity.

(b) The processed effluent is dumped into Mosquito Creek at a distance of about 100 yards from the plant. Sludge is used as fertilizer.

3. Electric Power.

(a) Electric power is obtained from the Eastern Shore Power and Light Company.

(b) There is a maximum of 1,750 kva available to the Station.

(c) The average station consumption is 1,150 kva.

(d) There are one 15 kw, two 75 kw, and three 50 kw emergency generators to supply vital circuits.

4. Gas Supply.

(a) There are 12 storage tanks of propane gas furnishing service to 107 family housing units.

(b) There is no natural gas service to the Station.

5. Heating System and Steam Mains.

(a) There are four 265 hp boilers in the central heating system. These furnish heat and hot water to all permanent structures on the Station with the exception of the family housing units and water pump houses.

(b) The family housing units are heated by individual oil heating plants.

(c) There is a total of 16,750 linear feet of main lines in the steam heating system.

6. Fuel Supply.

(a) Coal, which is the central heating system fuel, is supplied by outside contract.

(b) The fuel oil for housing area heating is also supplied by outside contract. The capacity of the two oil storage tanks is 46,000 gallons. In addition, each home has its individual storage tank.

7. Compressed Air Supply.

(a) No central compressed air system.

(b) There are four individual compressors on the Station.

D. WATERFRONT FACILITIES

1. Berthing Spaces.

(a) A 200x200-foot boat basin has been constructed on the eastern side of the Station. This basin is used to harbor Station boats and provide personnel and LCM loading facilities required to support the ranges.

2. Offshore Facilities.

(a) None.

E. NAVAL AIR FACILITY

1. Aircraft Landing Field.

<u>Runway Bearing</u>	<u>Material</u>	<u>Length - Feet</u>	<u>Width - Feet</u>
100° - 280°	Concrete	6,000	150
160° - 340°	Concrete	5,100	150
040° - 220°	Concrete	4,800	150

2. Aircraft Parking Area.

(a) 698,760 square feet (concrete).

F. RAILROAD, MOTOR, LIVESTOCK, AND OTHER EQUIPMENT

1. Maintenance Facilities.

(a) All motorized equipment is serviced and maintained at two garages.
(b) Full maintenance equipment is available.

2. Rolling Stock.

(a) No railroad rolling stock.

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3. Railroad Trackage.

(a) None.

4. Highway and Railroad Overpasses.

(a) None.

5. Railroad Scales.

(a) None.

6. Passenger Vehicles.

<u>Quantity</u>	<u>Type</u>
1	28-passenger bus
3	32-passenger busses
2	40-passenger busses
3	38-passenger busses
47	Jeeps
4	7-passenger station wagons
6	5-passenger sedans
4	2-passenger coupes

7. Motor Trucks and Trailers.

<u>Quantity</u>	<u>Type</u>
2	1½-ton cargo trucks
9	2½-ton cargo trucks
1	10-ton cargo truck
2	1½-ton express trucks
3	10-ton low boys
1	45-ton low boy
4	10-ton highway vans
1	10-ton tilt top
1	3½-ton refrigerator truck
2	Telephone maintenance trucks
3	Wreckers
1	1-ton milk truck
2	¾-ton milk trucks
12	Special electronic trucks
1	9 kw auxiliary lighting truck
22	Bomb trucks
2	Torpedo trucks
1	Motor scooter
12	1,600-gallon gasoline trucks
4	800-gallon gasoline trucks
2	500-gallon gasoline trucks
2	2,000-gallon gasoline trailers
1	500-gallon oil salvage trailer

REPRODUCED AT THE NATIONAL ARCHIVES

7. Motor Trucks and Trailers (Continued).

<u>Quantity</u>	<u>Type</u>
6	500-gallon oil trucks
23	1 $\frac{1}{2}$ -ton stake trucks
2	2 $\frac{1}{2}$ -ton stake trucks
3	3 $\frac{1}{2}$ -ton stake trucks
4	5-ton stake trucks
21	1 $\frac{1}{2}$ -ton dump trucks
3	2 $\frac{1}{2}$ -ton dump trucks
3	3-ton dump trucks
2	1 $\frac{1}{2}$ -ton truck tractors
2	2 $\frac{1}{2}$ -ton truck tractors
5	10-ton truck tractors
19	$\frac{1}{2}$ -ton pickup trucks
6	3/4-ton pickup trucks
1	1-ton pickup truck
1	1 $\frac{1}{2}$ -ton pickup truck
1	$\frac{1}{2}$ -ton panel truck
2	3/4-ton panel trucks
6	Carryalls
2	Weapon carriers
4	Reconnaissance cars

8. Mobile Fire-fighting Apparatus.

<u>Quantity</u>	<u>Type</u>
2	Seagrave Quad. 750 gpm pump
1	500 gpm Ford pumper
5	Crash trucks
1	Cardox chemical crash truck

9. Motor Ambulances.

<u>Quantity</u>	<u>Type</u>
2	4-passenger - 1 stretcher
1	3/4-ton panel converted

10. Special Motorized and Motor-drawn.

<u>Quantity</u>	<u>Type</u>
15	Radar trailers
1	Mobile aircraft pre-heater
2	7 $\frac{1}{2}$ kw motor generators
2	15 kw motor generators
5	50 kw motor generators
15	Shop mules
16	Fork lifts

REPRODUCED AT THE NATIONAL ARCHIVES

10. Special Motorized and Motor-drawn (Continued).

<u>Quantity</u>	<u>Type</u>
2	Magazine cranes
14	Bulldozers
14	Track tractors (cherry pickers)
2	Dozer shovels
2	Road rollers
2	500 gpm portable water pumps
3	70 to 90 psi air compressors
3	300-ampere arc welders
2	1,200-pound capacity amphibious cargo
3	1/2-yard concrete mixers
1	2-yard concrete mixer
3	Truck concrete mixers
13	Farm tractors
1	4-furrow plow
1	McCormick-Deering hay rake
2	Grass mowers
2	Street sweepers
7	Earth movers
3	Motor graders

11. Cranes.

<u>Quantity</u>	<u>Type</u>
1	10-ton, 50-foot boom
4	25-ton, 40-foot booms
1	10-ton, 22-foot boom
1	20-ton crash crane
1	5-ton, 11-foot boom
1	30-ton, 50-foot boom
1	5-ton, 50-foot boom

12. Livestock.

(a) None.

G. OTHER MISCELLANEOUS STATION FACILITIES

1. Streets and Roads.

- (a) 4.7 miles of concrete roads, average width 18 feet.
- (b) 2.1 miles of bituminous roads, average width 18 feet.
- (c) 1 mile of unpaved road, average width 16 feet.

2. Paved Sidewalks.

- (a) 3.2 miles, average width 4 feet.

8. Religious Facilities.

(a) Building C-7 houses the Chapel. A Catholic and a Protestant chaplain are assigned to the Station for duty.

9. Fences.

(a) 16,920 linear feet of wire mesh fencing.

10. Training Facilities.

The following training facilities are available:

- (a) Four link trainers.
- (b) One combined 16MM theatre and lecture room

11. Test Ranges.

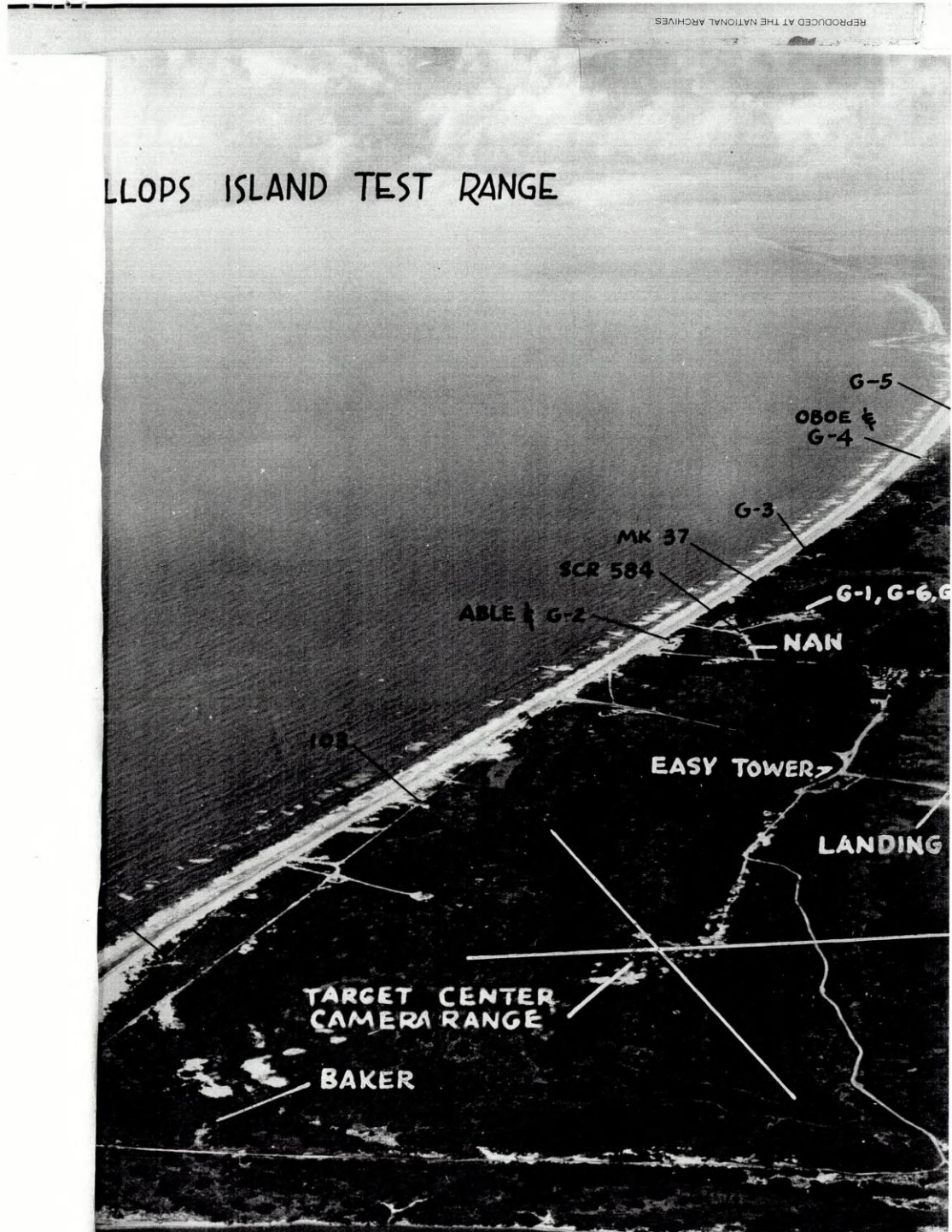
The following test ranges are available to the Naval Aviation Ordnance Test Station for use in connection with its various projects:

- (a) The Wallops Island test range.
- (b) The BULLSEYE, which is a Liberty ship hull grounded on a sand bar in the Chesapeake Bay.
- (c) The machine gun and rocket test range.



INSTRUMENTATION OF WALLOPS ISLAND

- G1 - Control Station for entire Wallops Island Range. Timing, synchronization, and communication for the entire range are controlled from G-1 by means of submarine cable.
- G2 - Tracking Station utilizes a 35MM Mitchell Camera equipped with 17.7" lens and mounted on a modified Mk 51 Mod 3 Gun Director Stand. In synchronism with this camera is a second 35MM Mitchell Camera used to photograph the director's azimuth and elevation positions as transmitted from its synchros.
- G3, G4, and G5 - Tracking Stations are identical with Station G2 except that 40" focal length lenses are used instead of 17.7" lenses.
- G6 - Side Camera Station, located 1,200 feet from one of the latest type missile launching platforms, utilizes a 16MM Fastax Camera operating at 500 feet per second to record acceleration and functioning of test missiles during the initial portion of trajectory.
- G7 - 35MM Mitchell Camera Station located 200 feet in front of the aforementioned missile launcher to record initial portion of launching.
- 101, 103 - Phototheodolite Tracking Stations each equipped with a 35MM Mitchell Phototheodolite with 12" focal length lens.
- Station Nan - Phototheodolite Station.
- Station Oboe - Phototheodolite Station.
- SCR-584 "S" Band Radar - Equipped with 35MM Mitchell Camera with 40" lens bore-sighted with antenna, 35MM Mitchell Camera for direct recording of azimuth and elevation scales, and a scope camera for recording range.
- Mk 37 Gun Director - Utilizes a Mk 25 Radar and Mk 8 Plotting Board. This unit is equipped with a 35MM Mitchell Antenna Camera and 35MM camera to record azimuth, elevation, and range.
- Baker, Able, and Easy Stations - Equipped with alidades and are used for rake information.
- Target Center Camera Range - Equipped with F-56 Cameras and used for evaluation of fire control devices.





W-4 U.S. Naval Aviation Ordnance Test Station.

1954 Instrumentation and Test Procedure for Measuring Firing Time Interval in Aircraft Machine Gun Ammunition, Development of, dated 27 May. Record Group 74; Entry 1007; Box 32; Folder NA111; National Archives, College Park, MD.

BUORD ROUTE SHEET
 NASAS FORM 89 B (REV. 12/51)

CONFIDENTIAL SECURITY INFORMATION

See reverse side for
 serial number

HANDLING DESIRED

- 22. Information.
- 33. Take appropriate action.
- 44. Comment and return.
- 55. Prepare reply for chief's signature.
- 66. See me on this.

DO NOT DETACH

ENCLOSURE
 No. 1234, Sec. 23

NW 26609
 HRM/MTM 10/20/05

REPRODUCED AT THE NATIONAL ARCHIVES

SECTION (1)	RELEASE		REMARKS (Indicate handling desired by number when applicable) (4)
	BY (Initials) (2)	DATE (3)	
Reza	HRM	6/14	3. Copy retained - Chirco seems to have taken exception to the Dalgren ltr (ref'd) & is defending their stand to the effect that their tests have been accurately performed. Actually, it was no intention of casting any reflections on Chirco's work but rather the fact that the F.A. test specified by BuOrd in O.S. 1894 is the real "culprit". Therefore, not the Chirco test, but really the F.A. test is to be investigated by NPG. I don't feel that jumping the acceptance criteria up to .005 sec is the answer to the problem. A new test is really needed.
Ma 3a-7	JP	6/15	44. STps from a TP ltr having high FTI sent to NPG from Chirco for further test.
Re-5	cd.	9/10	44. Ltr to Chirco has requested fixing times of individual rounds. Upon receipt of these data analysis will be performed in accordance with Re 2a cong memo to Re dtd 4 June 1954 p
Reza	S.D.	9/21	33. BuOrd ltr Reza-IPW: dtd 8/15/54 15 Jul 1954 to Chirco requests NAOTS to conduct tests in cooperation with NPG to arrive at a suitable test for this purpose.
Ma 3a7	JP	10/12	C. to Ma 3

00334 0016

5. FINAL DISPOSITION (Must be completed before return to files) ACTION COMPLETED NO ACTION REQUIRED BY (Initials) *JPW*

CONFIDENTIAL SECURITY INFORMATION U. S. GOVERNMENT PRINTING OFFICE 16-43889-1

W-4

REPRODUCED AT THE NATIONAL ARCHIVES

REPLY
REFER TO (ON20:FLY)
Address XI
Commanding Officer 0187
U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

27 MAY 1954

NA III
x MP9
Re 2
LS

REGISTERED MAIL ~~CONFIDENTIAL~~

From: Commanding Officer
To: Chief, Bureau of Ordnance

Subj: Instrumentation and Test Procedure for Measuring Firing Time Interval in Aircraft Machine Gun Ammunition; development of

- Ref: (a) BUORD ltr Re2a-JPW:fjm NP-9 of 10 May 1954 to CO, NPG, Dahlgren, Va.
(b) NAVORD O. S. 1894 Revision B of 12 Dec 1953
(c) MIL-C-11255A Amendment 1 of 28 Feb 1952
(d) CO NAOTS, Chincoteague, Va., ltr (ON20:FLY) XI ser 5306 of 12 Aug 1953
(e) JAN-A-625 of 30 Jun 1948

060354 0016

1. Reference (a) addressed to the Commanding Officer, U. S. Naval Proving Ground, Dahlgren, Virginia, with a copy to this station stated that ballistic acceptance test results of production lots of 20mm ammunition for the Mark 12 Aircraft Gun reported by this station indicate that the lots are not meeting the acceptance criteria for the firing time interval test, as specified in reference (b).

2. Reference (a) further stated that the true value of the firing time interval may not always have been reported, which indicates that a misunderstanding exists concerning the firing time interval test data. To date, this station has tested approximately 400 production lots of 20mm target practice ammunition and in each instance the "true value" of the maximum variation of the firing time interval, measured in accordance with the specific details of reference (b), has been reported. The instrumentation used is not complicated and has a high degree of reliability.

3. The firing time interval maximum variation specified in reference (b) is a measurement of the complete time interval from closing the firing circuit to projectile emergence from the barrel. This includes any firing circuit variables, gun functioning variables and finally ammunition variables. The acceptance criteria specified is a maximum variation of not over 0.0014 seconds. Reference (c) specifies the same type of test for 20mm electric primed ammunition for the M24 gun with an acceptance criteria of 0.005 seconds.

REGISTERED MAIL

3766

~~CONFIDENTIAL~~

1st try lot
T.P.
20mm

REGISTERED MAIL ~~CONFIDENTIAL~~

(ON20:FLY)
X/ 0187

REPRODUCED AT THE NATIONAL ARCHIVES

4. As stated in reference (d), the acceptable maximum variation time of 0.0014 seconds is not realistic for a test which includes firing circuit and gun variables in addition to ammunition variables. The same value is specified in reference (e) and applies to measurement of ammunition variables only, in a "hangfire" test of percussion primed .50 caliber small arms ammunition.
5. As reference (b) is an acceptance specification for ammunition only and does not include the gun or firing circuit acceptance, the firing time interval test should be modified to measure ammunition variables only, which can be done at any time at this station.
6. The alternate solution, if it is desired to continue the same test, is to increase the acceptance criteria to a value which is realistic for the firing circuit, gun and ammunition. The value 0.005 specified in reference (c) is recommended as the same firing circuit and a similar gun firing pin assembly is used as in the present tests.
7. Reference (a) stated that the wide dispersion in firing time intervals are apparently not the true value as they would have been reflected in other automatic firing ballistic tests. This is not correct, as the firing time interval variations would not be evident in any of the other tests conducted or data recorded. The firing time interval variation forms a portion of the cyclic rate of fire time variations and could be isolated by special tests.

Copy to:
BUORD (Re2) att.
BUORD (Ma3a) sent
NPG, Dahlgren, Va.

P.W. Jackson
P. W. JACKSON
Acting

060354 0016

~~CONFIDENTIAL~~

W-5 U.S. Naval Aviation Ordnance Test Station.

1947 Final Report on Ground Test of Prototype Automatic Reloadable Aircraft Rocket Launcher for 5"00 G.A.S.R., (MK 11 MOD 0), Task No. NAOTS 20-Re8b-114-1, dated 11 December. Record Group 74; Box 865; National Archives, College Park, MD.

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NAOTS
Task-20-Re8b
114-1
C.1

UNCLASSIFIED


FINAL REPORT

ON

GROUND TEST OF PROTOTYPE AUTOMATIC RELOADABLE
AIRCRAFT ROCKET LAUNCHER FOR
5700 G.A.S.R., (MK 11 MOD 0)

**NAVY DEPARTMENT
BUREAU OF ORDNANCE
TECHNICAL LIBRARY**

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E.O. 12958, Sec. 2.3
DATE 10/1/98
BY SP4JRM



Task No. NAOTS -20-Re8b-114-1

U.S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

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NAOTS/F41 U. S. NAVAL AVIATION ORDNANCE TEST STATION
(ON24/RER:dfm) CHINCOTEAGUE, VIRGINIA

Serial: 1302

NAVY DEPARTMENT
BUREAU OF ORDNANCE
TECHNICAL LIBRARY

~~RESTRICTED~~

UNCLASSIFIED

25 November 1947

From: The Commanding Officer
To: The Chief of the Bureau of Ordnance
Subj: Ground Test of Prototype Automatic Reloadable Aircraft
Rocket Launcher for 5700 G.A.S.R., (Mk 11 Mod 0), Task
Assignment NAOTS-20-Re8b-114-1, Report on.
Refs: (a) BuOrd ltr. S79-5(1) Re8b, dated 16 December 1946.
(b) BuOrd ltr. NA111(Re8)-RKS:hmg, dated 12 August 1947.
Encl: (A) NAOTS Chincoteague, Va., Rest. Report
NAOTS-20-Re8b-114-1, dated 25 November 1947.

1. The purpose of the test requested by reference (a) was to perform a functional test of the Prototype Automatic Reloadable Aircraft Rocket Launcher by ground firing.
2. It is concluded that the Mk 11 Mod 0 Prototype Automatic Reloadable Aircraft Rocket Launcher operates satisfactorily for ground firing.
3. It is recommended that a launcher incorporating the features of the Prototype Mk 11 Mod 0 launcher be manufactured suitable for mounting in an aircraft wing; and this launcher be installed in an aircraft wing and tested by ground firing to determine suitability for air firing.
4. Task Assignment NAOTS-20-Re8b-114-1 has been completed and the final report is forwarded herewith as Enclosure (A).

W. V. R. Vieweg
W. V. R. VIEWEG

Distribution:

As indicated in Appendix (D)

Classification cancelled or changed to _____
by authority of *Re 7a memo #7* on *11 May 54*
E. H. Falliater 13 Jul 54
NAVY BUREAU OF ORDNANCE

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOTS-20-Re8b-114-1 25 November 1947

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Distribution List - - - - -	-D
Total number of pages in report - - - - -	-35
Total number of photographs in report - - - - -	-7

ENCLOSURE (A)

- 2 -

REPRODUCED AT THE NATIONAL ARCHIVES

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOTS-20-Re8b-114-1 25 November 1947

I. INTRODUCTION

- A. The Ground Test of Prototype Automatic Reloadable Aircraft Rocket Launcher for 5000 G.A.S.R. (Mk 11 Mod 0) was initiated by Bureau of Ordnance letter S79-5(1) (Re8b), dated 16 December 1946, (Task Assignment NAOTS-20-Re8b-114-1), chargeable to Ordnance and Ordnance Stores Navy 1946 under Project Order No. 7321 Ordnance. See Appendix (A), which includes cover sheet of above letter, Bureau of Ordnance letter NALL1(Re8)-RKS:hmg, dated 12 August 1947.
- B. Description of Automatic Reloadable Rocket Launcher, Mk 11 Mod 0.

The 5000 Reloadable Automatic Rocket Launcher is a hydraulically operated mechanism firing 5000 spin stabilized aircraft rockets. The launcher basically consists of three parts, the feeder, the accelerator, and the firing chamber. The feeder is a chain driven set of three fingered sprockets which serve to drive the rockets at constant velocity toward the accelerator. The accelerator picks up the rocket round and, as its name implies, accelerates the round into the firing chamber. The firing chamber consists of a center firing tube and another concentrically mounted closing tube. The closing tube oscillates back and forth through an angle of 120° in timed relation to the accelerator, allowing the rocket to enter the chamber and be sealed off from the other rounds. The rocket is retained in the firing tube by a spring loaded detent which engages the groove in the rear of the rocket. The detent is set to hold up to three (3) g's fore and aft acceleration. When the outer tube is closed the detent has engaged the groove of the rocket, the firing circuit is energized and the rocket fires. However, if the rocket does not leave the tube within one third of the cycle, thus implying a hangfire or malfunction, then the launcher is stopped automatically by the electrical interlocks in the machine. At this point, the firing tube can be rotated to jettison the round and the tube returns to battery. Following this, the mechanism will start up and feed one rocket into the chamber, and the cycle may be resumed.

The mechanism is provided with a zeroing device so that if the operator removes his finger from the firing button, the cycle will continue until one round is placed into the tube.

ENCLOSURE (A)

- 3 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOTS-20-Re8b-114-1 25 November 1947

I. INTRODUCTION (Cont'd)

Thus, the launcher will always stop in firing position. In addition, at the will of the operator, the round in the chamber may be fired or jettisoned without reloading.

II. OBJECT

To test the Prototype Automatic Reloadable Aircraft Rocket Launcher for 5700 G.A.S.R. for satisfactory operation by ground firing.

The project was conducted in four phases. The object of each phase is outlined below:

Phase I

Familiarization with launcher and to test proper operation of launcher as received.

Phase II

To test rocket launcher for proper operation after minor modifications found desirable in Phase I.

Phase III

To test rocket launcher for proper automatic operation at various angles of elevation.

Phase IV

To obtain heat, stress, working pressures and other data with various blast deflection tubes installed. Naval Gun Factory technicians accomplished the instrumentation and obtained the data. The data will be analyzed by the Naval Gun Factory.

III. CONCLUSIONS

- A. That the prototype of the Mk 11 Mod 0 Automatic Reloadable Rocket Launcher operates satisfactorily for ground firing.
- B. That the average cyclic rate obtained during the tests of the launcher was 102.17 rounds per minute.

ENCLOSURE (A)

- 4 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOTS-20-Re8b-114-1 25 November 1947

III. CONCLUSIONS (Cont'd)

- C. That the highest cyclic rate attained in this test was 138.56 rounds per minute.
- D. That the jettisoning feature of this launcher needs a positive means of ejection rather than the free fall ejection as in the present model.

IV. RECOMMENDATIONS

- A. That a launcher incorporating features of the Prototype Mk 11 Mod 0 launcher be manufactured suitable for mounting in an aircraft wing.
- B. That above launcher be installed in an aircraft wing and tested by ground firing to determine its suitability for mounting in an aircraft.
- C. That if (B) above gives satisfactory results, the launcher be installed in an aircraft and be given a flight test to determine its suitability as a service weapon.

V. RECORD AND DISCUSSION OF TESTS

A. Chronological Data

- (1) 16 December 1946 - Received project directive, Bureau of Ordnance letter S79-5(1) (Re8b), dated 16 December 1946.
- (2) 12 March 1947 - Received Prototype Automatic Reloadable Aircraft Launcher, Mk 11 Mod 0.
- (3) 13 March 1947 - Naval Gun Factory Representatives completed final assembly and explained operation of launcher.
- (4) 14 March 1947 - Installed flash shield on launcher.
- (5) 17 March 1947 - Constructed and installed flash collar and shield. Hydraulic power unit and portable generator operated satisfactorily.
- (6) 18 March 1947 - Awaiting arrival of rockets to continue test.

ENCLOSURE (A)

- 5 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOTS-20-Re8b-114-1 25 November 1947

V. RECORD AND DISCUSSION OF TESTS (Cont'd)

- (7) 23 April 1947 - Received 50 5W00/14 G.A.S.R. CIT Mod 39A Rockets.
- (8) 24 April 1947 - Rocket launcher installed on firing range at Wallops Island. Operation satisfactory with dummy rockets. Awaiting arrival of Naval Gun Factory technicians prior to testing with live ammunition.
- (9) 29 April 1947 - Naval Gun Factory technicians arrived to start Phase I of test firing.
- (10) 2 May 1947 - Phase I of test completed, twenty-three (23) rounds fired. Launcher returned to ordnance shop for modifications.
- (11) 13, 14 May 1947 - Installed additional firing pin, positive ground pin, improved anti-bounce mechanism, and positive positioning stop.
- (12) 15 May 1947 - Launcher re-installed on firing range on Wallops Island and conducted Phase II of test, eighteen (18) rounds fired.
- (13) 21 May 1947 - Launcher returned to Naval Gun Factory for minor repairs while waiting for additional ammunition.
- (14) 30 June 1947 - Received 34 5W00/14 G.A.S.R. CIT Mod 39A rockets.
- (15) 9 July 1947 - Received 116 5W00/14 G.A.S.R. CIT Mod 39A rockets.
- (16) 15 July 1947 - Launcher returned to NAOTS, Chincoteague, Va.
- (17) 21 July 1947 - Launcher re-installed on firing range in preparation for Phase III of test.
- (18) 30 July 1947 - Operation of launcher demonstrated for representatives of Chief of Naval Operations, Naval Gun Factory, Bureau of Ordnance, Naval Ordnance Laboratory and Army Ordnance. Phase III of test completed, sixty-seven (67) rounds fired.

ENCLOSURE (A)

- 6 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOIS-20-Re8b-114-1 25 November 1947

V. RECORD AND DISCUSSION OF TESTS (Cont'd)

- (19) 4 August 1947 - Launcher returned to the Naval Aviation Ordnance Test Station Armory awaiting installation of Blast Angle Deflection Tubes.
- (20) 15 August 1947 - Received cover sheet of project directive, Bureau of Ordnance letter NALL1(Re8)-RKS:hmg, dated 12 August 1947.
- (21) 5 September 1947 - Naval Gun Factory technicians completed installation of Blast Angle Deflection Tubes and gauges and wiring for obtaining data for Phase IV.
- (22) 8 September 1947 - Launcher re-installed on firing range to commence firing of Phase IV of test.
- (23) 15 September 1947 - Firing of Phase IV interrupted because of hurricane warning.
- (24) 30 September 1947 - Resumed firing of Phase IV.
- (25) 2 October 1947 - Final firing of Phase IV and completion of test, sixty-nine (69) rounds fired. Naval Gun Factory technicians returned to Naval Gun Factory with data and records obtained during Phase IV of this test.
- (26) 16 October 1947 - Rocket launcher shipped to Naval Gun Factory.
- (27) 5 November 1947 - Cyclic rate data on Phase IV received from Naval Gun Factory.

B. Discussion of Tests

1. A total of one hundred and seventy-seven (177) rockets were fired in the prototype of the Automatic Reloadable Aircraft Rocket Launcher, Mk 11 Mod 0 with the following results:
 - (a) Phase I - 23 rockets were fired with 9 stoppages
 - (b) Phase II - 18 rockets were fired with 2 stoppages

ENCLOSURE (A)

- 7 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOTS-20-Re8b-114-1 25 November 1957

V. RECORD AND DISCUSSION OF TESTS (Cont'd)

- (c) Phase III - 67 rockets were fired with 2 stoppages
- (d) Phase IV - 69 rockets were fired with 1 stoppage.

In addition to the rockets above fired in the test launcher, nine (9) rockets were fired in a Mk 7 rocket launcher during Phase I to test for duds. One additional rocket was fired during Phase III to test Squib tester. The total number of rockets fired is 187.

The detailed firing record of each test is contained in Appendix (B).

The main object of the first three phases of this project was to obtain satisfactory operation of the launcher, thus establishing and confirming the principles employed in the design of the Mk 11 Mod 0 rocket launcher.

The fourth and final phase was conducted to obtain further design data with various blast deflection tubes for subsequent models of this launcher and to obtain cyclic rate data.

Frequent reference is made in the firing data contained in Appendix (C) to estimated operating speeds. These estimated operating speeds were obtained by calibrating the variable flow hydraulic valve controlling the operation of the launcher. For the calibration of this valve, the launcher was operated with no rockets in the feeder or accelerator.

2. Upon completion of firing of the twenty-three (23) rockets of Phase I, the need for a more positive firing circuit and a more positive means of aligning the rocket in the firing tube was evident. These modifications were made prior to the firing of Phase II.
3. During the firing of the eighteen (18) rockets in Phase II there were no stoppages due to the firing

ENCLOSURE (A)

- 8 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOIS-20-Re8b-114-1 25 November 1947

V. RECORD AND DISCUSSION OF TESTS (Cont'd)

circuit or rocket mis-alignment. Since the initial supply of rockets was expended, it was decided to utilize the time while awaiting the next shipment of rockets in improving the feeding and anti-bounce mechanism, the causes of the two (2) stoppages encountered in Phase II.

4. During the firing of the sixty-seven (67) rockets in Phase III, only two (2) stoppages occurred. The cause of these being a defective pressure bell on the air connection between the large accumulator and pressure gauge and a broken connection in the firing circuit cable.
5. At the conclusion of the firing tests of Phase III the jettisoning mechanism was tested at various angles of elevation. It was found that the jettisoning mechanism does not operate properly at angles of elevation in excess of 15° above the horizontal. At these elevations the rocket being jettisoned falls nose down from the firing tube. This angle of drop cants the guide groove of the rocket on the rocket retaining lug, thereby preventing the rocket from clearing the tube. Views of a rocket jam after jettisoning from 30° elevation are shown in Photograph Plates Nos. 3, 4 and 5 of Appendix (B). However, the jettison mechanism of the launcher will operate satisfactorily up to 15° elevation and was tested prior to each days firing.

All troubles encountered in the jettison mechanism at low angles of elevation ($0-15^{\circ}$ above the horizontal) can be charged to the abnormal conditions of salt air and beach sand as the launcher was tested on the open beach at Wallops Island, Va., which made it impossible to keep the launcher free of sand and grit and caused added friction to all moving parts.

6. Phase IV consisted of firing at 15° , 30° and 60° elevation using blast angle deflection tubes of 10, 20, 30, 40, 50, 70 and 90 degrees at operating speeds (estimated) of 120 to 180 rounds per minute as outlined in the firing test data of Appendix (C). The blast angle deflection tubes used in this phase are shown in Plate #6 Appendix (B). The blast angle deflection tubes were installed in sequence beginning with the 10 degree tube. The 40°

ENCLOSURE (A)

- 9 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~RESTRICTED~~ TASK ASSIGNMENT NAOTS-20-Re8b-114-1 25 November 1917

V. RECORD AND DISCUSSION OF TESTS (Cont'd)

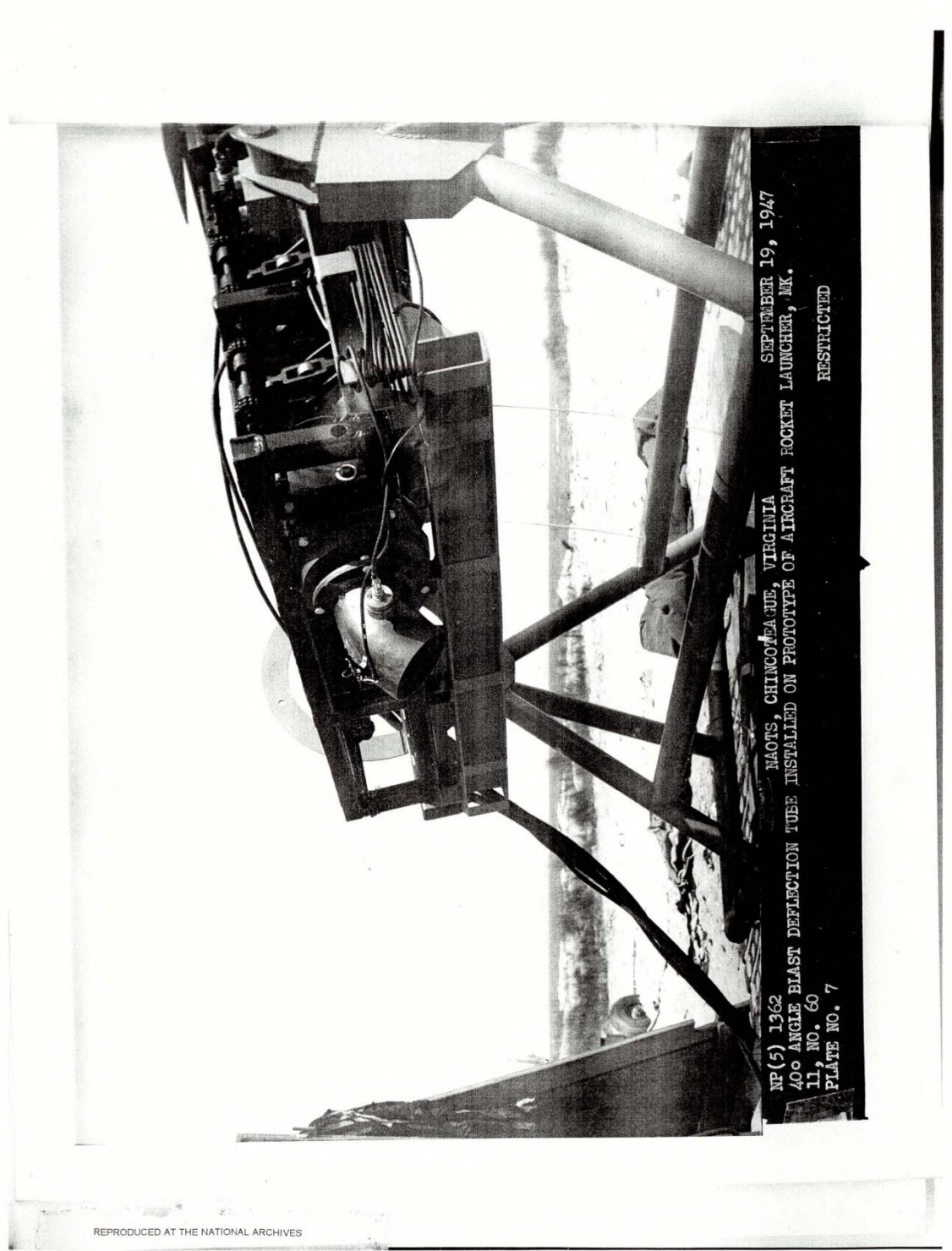
tube is shown installed on the launcher ready to fire in Plate 7 of Appendix (B). A single round was fired with each tube prior to firing a burst. The effect of the blast of each tube on the launcher operation was visually observed before increasing the angle. A single round and a burst of three (3) rockets were fired with each deflection tube with the exception of the 90° tube in which a single round, four (4) bursts of five (5) and one (1) burst of four (4) rockets were fired. With each increase of the blast tube angle, an increase in temperature and an increase in recoil was observed. As well as can be determined by visual observation, the blast angles had a negligible effect on the proper functioning of the launcher.

A total of sixty-nine (69) rounds were fired with only one (1) stoppage during Phase IV. This stoppage was a double load, jamming the feeding mechanism. It is believed to have been caused by a hangfire and the failure of the hangfire feature of the launcher to operate. The hangfire feature is designed to stop the operation of the launcher if the rocket to be fired fails to fire within one tenth (1/10) of a second after the firing tube closes. After clearing the jam, inspection disclosed that the contact point of the hangfire feature had loosened. Thus, the open circuit caused by the loose contact point made the hangfire feature inoperative, allowing the launcher to remain in operation feeding another round into the firing chamber against the unfired rocket.

At the end of Phase IV, the launcher was operated on a pre-loading test run at the maximum operating speed to check the zeroing and hangfire mechanisms at maximum speed. During this high speed operation, the tube opening and closing drive gear housing carried away, allowing the gear train on the outer tube to disengage with the drive gears. It is believed that this breakage would not have occurred had the launcher been loaded and firing. The excessive vibration at high speed with an empty launcher subjected the drive gear housing to severe strain resulting in the failure.

ENCLOSURE (A)

- 10 -



REPRODUCED AT THE NATIONAL ARCHIVES

FIRING RECORDS OF GROUND TEST
FIRING OF PROTOTYPE OF AUTOMATIC
RELOADABLE ROCKET LAUNCHER
MK 11 MOD 0

PHASE 1 OF FIRING TESTS

All tests in Phase 1 of this report were made with Rocket Launcher at 15° elevation, using 5W00/14 GASR MM 216 rockets. The launcher was operated at approximately ninety (90) rounds per minute. The position numbers referred to below are as follows:

- Position #1 - First rocket position from firing tube.
- Position #2 - Second rocket position from firing tube.
- Position #3 - Third rocket position from firing tube.
- Position #4 - Fourth rocket position from firing tube.
- Position #5 - Fifth rocket position from firing tube.

FIRING TEST

REMARKS

27 April 1947 One (1) Rocket from each of five (5) boxes fired from Mk 7 launcher to test safety performance. Test satisfactory in all respects.

29 April 1947

Test 1	
Loaded one rocket in tube.	Fired
Test 2	
Loaded one rocket in tube.	Failed to fire. Firing contacts dirty with oil and sand.
Test 3	
Loaded one rocket in tube.	Fired
Test 4	
Loaded one rocket in #5 position.	Loaded and fired.

APPENDIX (C)

- 1 -

OFFICE OF RECORDS AND COMMUNICATIONS
FIRING RECORDS OF SECOND TEST

PHASE 1 (Cont'd)

FIRING TEST

REMARKS

29 April 1947 (Cont'd)

Test 5

Loaded 2 rockets in #4 and #5 positions. Loaded and fired.

Test 6

Loaded 3 rockets in #2, #4 and #5 positions.

First rocket jammed in tube. Probable cause - Rocket bounced upon entering tube.

Test 7

Loaded rockets in #1 and #2 positions.

Rockets entered tube but did not fire. Cause - "winner tube" opened, breaking firing circuit. Accumulator pressure low.

Test 8

Loaded rocket in #1 position.

Rocket fed into tube, failed to fire. Cause - oil on contact points.

At completion of days firing four (4) rockets that failed to fire were fired from a Mk 7 type launcher. No duds.

Total rockets fired in launcher to date - 5.

Total rockets fired to date - 14.

30 April 1947

Test 9

Loaded rocket in #5 position.

Loaded and fired.

Test 10

Loaded rockets in all 5 positions.

Rockets #1 and #2 loaded.

APPENDIX (C)

- 2 -

PHASE 1 (Cont'd)

FIRING TEST

REMARKS

30 April 1947 (Cont'd)

Test 10 (Cont'd)

and fired, #3 loaded into tube but failed to fire. Cause - tension on retaining lug loosened causing improper alignment of rocket.

Test 11

Loaded rocket in #3, #4 and #5 positions.

Loaded and fired.

Rockets fired this date - 6.

Total fired in launcher to date - 11.

Total fired to date - 20.

1 May 1947

Test 12

Loaded 6 rockets in launcher in all five positions and one in tube.

Rockets #1 and #2 fired, #3 loaded but failed to fire. After one minute delay, #3 fired on second attempt. #4 loaded but did not fire. After second attempt to fire rocket was found to be 1/8" out of alignment. Retaining lug not properly sealed in groove. Rocket was seated properly and fired. #5 loaded and fired. #6 jammed half way in tube. Rocket apparently bounced. Jam on #6 rocket was cleared, loaded into tube properly and fired.

APPENDIX (C)

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PHASE 1 (Cont'd)

FIRING TEST

REMARKS

1 May 1947 (Cont'd)

Test 13

Loaded launcher with 5 rockets in positions #1, #2, #3, #4 and #5.

Rockets #1 and #2 loaded and fired. #3 loaded but failed to fire. Fired on second attempt after one minute delay. #4 and #5 loaded properly and fired in automatic.

Test 14

Loaded one rocket in #5 position.

Rocket loaded properly and fired.

Rockets fired in launcher this date - 12.

Total rockets fired in launcher - 23.

Total rockets fired - 32.

APPENDIX (C)

- 4 -

PHASE 2

FIRING TEST

REMARKS

15 May 1947

Test 15	
Loaded one rocket in #5 position.	Rocket loaded into tube and fired.
Test 16	
Loaded 5 rockets in #1, #2, #3, #4 and #5 positions.	Rockets loaded into tube and fired properly.
Test 17	
Loaded 5 rockets in #1, #2, #3, #4 and #5 positions.	Rockets #1, #2 fired. #3 jammed half way in tube, cleared jam and fired #3, #4 and #5.
Test 18	
Loaded 5 rockets in all 5 positions.	Rockets #1, #2 and #3 loaded and fired. #4 jammed - caused by "inner tube" opening. Jam cleared and #4 and #5 fired.
Test 19	
Loaded 2 rockets in #4 and #5 positions.	Rockets loaded and fired.
Rockets fired in launcher this date - 18.	
Total Rockets in launcher fired - 41.	
Total Rockets fired - 50.	

APPENDIX (C)

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PHASE 3

All tests in Phase 3 of this report were made using 5W00/14 GASR MM 216 rockets. The elevation and estimated operating speed varied during test and is indicated under remarks.

FIRING TEST

REMARKS

22 July 1947

Test 20

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Rockets loaded into tube properly and fired burst of five (5). Elevation 15°, estimated speed 120 RPM.

Test 21

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Rockets loaded into tube properly and fired burst of five (5). Elevation 15°, estimated speed 120 RPM.

Test 22

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Rockets loaded into tube properly and fired burst of five (5). Elevation 15°, estimated speed 120 RPM.

Test 23

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Rockets #1, #2 and #3 loaded properly and fired. #4 jammed at canted angle in firing tube. Removed #4, #5 loaded properly and fired. Cause - loss of air pressure in large accumulator. Elevation 15°, estimated speed 120 RPM.

APPENDIX (C)

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PHASE 3 (Cont'd)

FIRING TEST

REMARKS

22 July 1947 (Cont'd)

Rockets fired in launcher this date - 19.

Total rockets fired in launcher to date - 60.

Total rockets fired to date - 69.

23 July 1947

One rocket fired in Mk 7 rocket launcher to test Squib Tester.

Required 375 milliamperes of electric current to fire this rocket. Squib Tester satisfactory.

Test 24

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Rockets loaded into tube properly and fired burst of five (5). Elevation 15° estimated speed 120 RPM.

Test 25

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Rockets loaded into tube properly and fired burst of five (5). Elevation 15° estimated speed 120 RPM.

Rockets fired this date - 10.

Total fired to date - 70.

24 July 1947

Test 26

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Rockets loaded into tube properly and fired burst of five (5). Elevation 15° estimated speed 140 RPM.

APPENDIX (C)

- 7 -

PHASE 3 (Cont'd)

FIRING TEST

REMARKS

24 July 1947 (Cont'd)

Rockets fired in launcher this date - 5.
Total rockets fired in launcher to date - 75.
Total rockets fired to date - 85.

29 July 1947

Test 27

Loaded three (3) rockets in #3, #4
and #5 positions.

Rockets loaded into tube
properly and fired burst
of three (3). Elevation
30°, estimated speed 140
RPM.

Test 28

Loaded five (5) rockets in #1, #2, #3,
#4 and #5 positions.

Rockets loaded into tube
properly and fired burst
of five (5). Elevation
60°, estimated speed 140
RPM.

Rockets fired in launcher this date - 8.
Total rockets fired in launcher to date - 83.
Total rockets fired to date - 93.

30 July 1947

Test 29

Loaded five (5) rockets in #1, #2, #3,
#4 and #5 positions.

Rockets loaded into tube
properly and fired burst
of five (5). Elevation
15°, estimated speed 120
RPM.

Test 30

Loaded five (5) rockets in #1, #2,
#3, #4 and #5 positions. Dummy
round in #3 position.

#1 and #2 loaded properly
and fired. #3 (dummy)
loaded properly, failed
to jettison on attempt.

APPENDIX (C)

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PHASE 3 (Cont'd)

FIRING TEST

REMARKS

30 July 1947 (Cont'd)

Test 30 (Cont'd)	Cause - canvas cover fouled jettison mechanism. Elevation 15°, estimated speed 140 RPM.
Test 31	
Loaded five (5) rockets. Live rounds in #1, #2 positions. Dummy round in #3 position.	#1 and #2 loaded properly and fired, #3 (dummy) loaded properly and jettisoned properly. Elevation 15°, estimated speed 140 RPM.
Test 32	
Loaded five (5) rockets. Live rockets in #1, #2, #4, #5 and dummy round in #3 position.	Fired #1 and #2. #3 (dummy) failed to jettison. Cause - high back pressure on low accumulator.
Test 33	
Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.	Rockets loaded into tube properly and fired burst of five (5). Elevation 30°, estimated speed 140 RPM.
Test 34	
Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.	#1, #2, #3 and #4 loaded properly and fired burst of four (4). Launcher stopped with rocket #5 in #1 position. After one minute delay, #5 loaded in tube properly and fired on first attempt to fire after stoppage. Probable cause - interruption in electrical circuit causing entire launcher to become inoperative. Examination of launcher gave no indication of exact cause. Elevation 60°, estimated speed 140 RPM.

APPENDIX (C)

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PHASE 3 (Cont'd)

FIRING TEST

REMARKS

30 July 1947 (Cont'd)

Test 35

Loaded four (4) rockets in #2, #3,
#4 and #5 positions.

Rockets loaded into tube
properly and fired burst
of four (4) at maximum
operating speed. Eleva-
tion 15°, estimated speed
180 RPM.

Rockets fired in launcher this date - 25.

Total rockets fired in launcher to date - 108.

Total rockets fired to date - 118.

APPENDIX (C)

- 10 -

PHASE 4

All tests in Phase 4 of this report were made using 5100/14 G.A.S.F. MM216 rockets. The elevation, Blast Angle Deflector Tubes and speed varied during test and is indicated under remarks.

FIRING TEST

REMARKS

9 September 1947

Test 36

Loaded one (1) rocket in #5 position.

Rocket loaded and fired.
Elevation 15° blast
angle deflection tube
10°, estimated speed
120 RPM.

Test 37

Loaded three (3) rockets in #3, #4
and #5 positions.

Rocket loaded into tube
properly and fired burst
of three (3). Elevation
15°, blast angle de-
flection tube 10°, esti-
mated speed 120 RPM.

Rockets fired in launcher this date - 4.

Total rockets fired in launcher to date - 112.

Total rockets fired to date - 122.

10 September 1947

Test 38

Loaded one (1) rocket in #5 position.

Rocket loaded and fired.
Elevation 15° Blast Angle
Deflection Tube 20°,
estimated speed 120 RPM.

Test 39

Loaded three (3) rockets in #3, #4
and #5 positions.

Rockets loaded into tube
properly and fired burst
of three (3) elevation
15° Blast Angle Deflec-
tion Tube 20°, estimated
speed 120 RPM.

APPENDIX (C)

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PHASE 4 (Cont'd)

FIRING TEST

REMARKS

10 September 1947 (Cont'd)

Test 40	
Loaded one (1) rocket in #5 position.	Rocket loaded and fired. Elevation 15° Blast Angle Deflection Tube 30°, esti- mated speed 120 RPM.
Test 41	
Loaded three (3) rockets in #3, #4 and #5 positions.	Rockets loaded into tube properly and fired burst of three (3), elevation 15°, Blast Angle Deflec- tion Tube 30°, estimated speed 120 RPM.
Test 42	
Loaded one (1) rocket in #5 position.	Rocket loaded and fired. Elevation 15° Blast Angle Deflection Tube 40°, estimated speed 120 RPM.
Test 43	
Loaded three (3) rockets in #3, #4 and #5 positions.	Rockets loaded into tube properly and fired burst of three (3). Elevator 15°, Blast Angle Deflec- tion Tube 40°, Estimated speed 120 RPM.
Test 44	
Loaded one (1) rocket in #5 position.	Rocket loaded and fired. Elevation 15°, Blast Angle Deflection Tube 50°, estimated speed 120 RPM.
Test 45	
Loaded three (3) rockets in #3, #4 and #5 positions.	Rockets loaded into tube properly and fired burst of three (3). Elevation 15°, Blast Angle Deflec- tion Tube 50°, estimated speed 120 RPM.

APPENDIX (C)

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PHASE 4 (Cont'd)

FIRING TEST

REMARKS

10 September 1947 (Cont'd)

Rockets fired in launcher this date - 16.

Total rockets fired in launcher to date - 128.

Total rockets fired to date - 138.

11 September 1947

Test 46

Loaded one (1) rocket in #5 position.

Rocket loaded and fired.
Elevation 15° Blast Angle
Deflection Tube 70°, esti-
mated speed 120 RPM.

Test 47

Loaded five (5) rockets in #1, #2, #3,
#4 and #5 positions.

#1, #2 and #3 loaded into
tube properly and fired.
#4 loaded into tube, did
not fire. Hangfire mechanism
failed to function allowing
launcher to continue to
operate. Firing tube opened
and jammed rocket #5 against
rocket #4 still in tube.
Cause - contact point
loosened due to vibration
causing hangfire feature to
be inoperative. Jam was
cleared and the two un-
expended rockets loaded into
launcher in reverse order.
Rockets #4 and #5 then loaded
into tube properly and fired.
There was an appreciable de-
lay between the time #5
rocket entered tube and when
it fired. It is believed
that this delay and the hang-
fire mechanism failing as
described above caused the
double load and jam. Eleva-
tion 15°, Blast Angle De-
flection Tube 70°, estimated
speed 120 RPM.

APPENDIX (C)

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PHASE 4 (Cont'd)

FIRING TEST

REMARKS

11 September 1947 (Cont'd)

Test 48

Loaded one (1) rocket in #5 position.

Rocket loaded and fired.
Elevation 15°, Blast
Angle Deflection Tube 90°,
estimated speed 120 RPM.

Rockets fired in launcher this date - 7.

Total rockets fired in launcher to date - 135.

Total rockets fired to date - 145.

30 September 1947

Test 49

Loaded five (5) rockets in #1, #2, #3,
#4 and #5 positions.

Rockets loaded into tube
properly and fired. Elevation 15°, Blast Angle
Deflection Tube 90°, estimated speed 120 RPM.

Test 50

Loaded five (5) rockets in #1, #2, #3,
#4 and #5 positions.

Rockets loaded into tube
properly and fired.
Elevation 15°, Blast
Angle Deflection Tube
90°, estimated speed
120 RPM.

Test 51

Loaded five (5) rockets in #1, #2, #3,
#4 and #5 positions.

Rockets loaded into tube
properly and fired.
Elevation 15°, Blast
Angle Deflection Tube 90°,
estimated speed 120 RPM.

Rockets fired in launcher this date - 15.

Rockets fired in launcher to date - 150

Total rockets fired to date - 160.

APPENDIX (C)

- 14 -

PHASE 4 (Cont'd)

FIRING TEST

REMARKS

1 October 1947

Test 52

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Launcher failed to operate on first three attempts. On fourth attempt all five rockets loaded and fired when master switch was turned on without closing firing pickle. Cause - wiring used for instrumentation records erroneously installed, by-passing firing pickle. Elevation 15°, no Blast Angle Deflection Tube used. Estimated speed 120 RPM.

Rockets fired in launcher this date - 20.

Total rockets fired in launcher to date - 155.

Total rockets fired to date - 165.

2 October 1947

Test 53

Loaded five (5) rockets in #1, #2, #3, #4 and #5 positions.

Fired three (3) rockets in automatic changed control panel to "Safe", #4 rocket loaded into tube, did not fire, fired #4 with control panel on "No Reload", #4 fired, #5 did not load. Changed control panel to automatic, #5 loaded and fired. "Safe" and "No Reload" feature functioned properly. Elevation 15°, no Blast Angle Deflection Tube. Estimated speed 120 RPM.

APPENDIX (C)

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PHASE 4 (Cont'd)

FIRING TEST

REMARKS

2 October 1947 (Cont'd)

Test 54

Loaded five (5) rockets. Live in #1,
#2, #3, #4 positions. Dummy in #5 position.

#1 rocket loaded into tube with control panel on "No Reload". Fired #2, #3, and #4 on automatic. Dummy loaded into tube properly. Attempt to jettison with launcher at 15° elevation failed. "Safe" and "No Reload" feature functioned properly. Jettison mechanism failed due to excess friction caused by sand. Elevation 60°, no Blast Angle Deflection Tube.

Test 55

Loaded five (5) rockets. Live in #1, #2,
#3, and #4 positions. Dummy in #5 position.

#1 rocket loaded into tube with control panel on "No Reload". Fired #2, #3 and #4 on automatic. Dummy loaded into tube properly. "Safe" and "No Reload" feature functioned properly. Elevation 15°, no Blast Angle Deflection Tube, Estimated speed 150 RPM.

Test 56

Loaded five (5) rockets. Live in #1,
#2, #3 and #4 positions. Dummy in #5 position.

Rockets loaded into tube properly and fired. #5 (Dummy) loaded into tube. Attempt to jettison failed due to excess friction caused by sand. Elevation 15°

APPENDIX (C)

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PHASE 4 (Cont'd)

FIRING TEST

REMARKS

2 October 1947 (Cont'd)

Test 56 (Cont'd)

Blast Angle Deflection
Tube 90°, estimated speed
180 RPM.

Test 57

Loaded five (5) rockets in #1, #2, #3,
#4 and #5 positions.

Rockets loaded into tube
properly and fired burst
of five (5). Elevation
30° Blast Angle Deflection
Tube 90°, estimated speed
180 RPM.

Rockets fired in launcher this date - 22.

Total rockets fired in launcher to date - 177.

Total rockets fired to date - 187.

Test 58

On pre-loading dry run test with the variable flow valve opened
~~sixteen~~ (16) turns, which is maximum operating speed, the tube
opening and closing drive gear housing broke, allowing the gear
train on outer tube to disengage the drive gears. This test was
made to check the zeroing and hang fire mechanism at high speed.
It is believed that this breakage would not have occurred had
the launcher been loaded and firing.

APPENDIX (C)

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PHASE IV (Cyclic)

CYCLIC RATE STUDY OF PHASE IV

The following cyclic rates, rounds per minute, were obtained from automatic firing. The rates are based upon the times between ignition of successive rockets.

Test 52 - 5 rounds 111.30
 112.78
 101.69
 98.68

Average - 106.11

Test 53 - 3 rounds 92.59
 73.53

Average - 83.06

Test 55 - 4 rounds 138.56
 80.32
 82.42

Average - 100.43

Test 56 - 4 rounds 122.44
 118.11
 85.71

Average - 108.75

Test 57 - 5 rounds 100.84
 118.34
 79.36
 118.11

Average - 104.16

The overall average of all cyclic rates obtained is 102.17 rounds per minute.

APPENDIX (C)

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Address Reply to
Bureau of Ordnance Navy
Department and Refer to

NAVY DEPARTMENT
BUREAU OF ORDNANCE
WASHINGTON 25, D.C.

NA111
(ReS)-RKS:hmg

12 August 1947

From: Chief of the Bureau of Ordnance
To: Commanding Officer
Naval Aviation Ordnance Test Station
Chincoteague, Virginia
Subj: Automatic Reloadable Aircraft Rocket Launcher, Ground
Test of Prototype.

1. It is requested that the task assignment described below be undertaken. It is further requested that the Bureau be notified if the completion date desired below cannot be met without interference to previous assignments, with information as to how previous assignments will be affected if this date is met and what date can be met without interference.

TASK ASSIGNMENT NO.	ESTIMATED COST	DESIRED COMPLETION DATE
NAOTS-20-Re8b-114-1	\$30,000.00	30 October 1947

PROJECT ORDER NO.	BUORD LIAISON ENGINEER	SECURITY CLASSIFICATION
7321-Ord	Mr. J.C. Russell x 5987	Unclassified

TECHNICAL DATA AND INSTRUCTIONS:

(a) It is requested that this form be used as the cover sheet on BuOrd letter S79-5(1) (Re8b) to NAOTS, Chincoteague 16 December 1946.

G. F. HUSSEY, JR.

/s/ W. M. Romberger
By direction

TASK ASSIGNMENT TO ACTIVITY
NAVORD FORM 1839 (New 7/47)

C-O-P-Y

APPENDIX (A)

A-705

- 1 -

Address Reply to BUREAU OF ORDNANCE
Bureau of Ordnance Navy WASHINGTON 25, D.C.
Department and Refer to

S79-5(1)
(Re8b)

16 December 1946

From: The Chief of the Bureau of Ordnance
To: The Commanding Officer
Naval Aviation Ordnance Test Station
Chincoteague, Virginia

Subj: Ground Test of Prototype Automatic Reloadable Aircraft
Rocket Launcher for 5000 G.A.S.R.

Encl: (A) NavOrd OS 3554
(HW)

1. It is requested that the subject aircraft rocket launcher be tested for satisfactory operation by ground firing. The Aviation Ordnance Department, Naval Gun Factory, Washington, D.C., is manufacturing the prototype. The scheduled date of completion of assembly and delivery to the Naval Aviation Ordnance Test Station, Chincoteague, Virginia will be about 15 January 1947.

2. Two hundred rounds of live 5000/14 GASR Model 39 rockets with inert heads have been ordered for the test, to be delivered to NAOTS, Chincoteague. Ten dummy rockets provided for ship tests will be delivered by the Naval Gun Factory with the launcher for simulated firing tests.

3. The following requirements are submitted to assist NAOTS rather than govern the test procedure:

I. Inspection

A detailed inspection shall be made to check the mechanism for proper assembly and operation. The launcher should be specifically checked to determine the fulfillment of the requirements set forth in the following items of Enclosure (A): E-1c(2), E-1d(4), E-1d(7), E-1d(10) and E-1f.

II. Simulated Firing

Operate the launcher, using dummy rounds and the jettisoning feature to clear the firing chamber, through five cycles in each of the following positions:

(a) In a horizontal position.

G-O-P-Y

APPENDIX (A)

- 2 -

(ReBb)

Subj: Ground Test of Prototype Automatic Reloadable Aircraft
Rocket Launcher for 5400 G.A.S.R.

II. Simulated Firing (Cont'd)

- (b) Longitudinal axis at ± 30 , ± 60 , -30 and -60 degrees elevation.
- (c) With the longitudinal axis in a horizontal position rotate the launcher in increments of 45 degrees about the longitudinal axis of the firing tube.

III. Ground Firing

- (a) With the launcher in a horizontal position fire:
 - (1) Five (5) single shots.
 - (2) Three (3) bursts of two (2) rounds.
 - (3) A burst of six (6) rounds.
- (b) At 45° elevation fire a burst of six (6) rounds.
- (c) At 60° elevation fire a burst of six (6) rounds.
- (d) Fire the launcher in automatic bursts of six (6) rounds at a low degree of elevation and rotate in increments of 45 degrees about the longitudinal axis of the firing tube.

IV. The fact that the design features incorporated in the subject launcher have not been proven by previous firing test is brought to the attention of NAOTS personnel. The launcher should be fired from a remote source and all personnel in the test area should be protected by the use of blast shelters.

G. F. HUSSEY, JR.

RAW/ms

cc: NavGun

/s/ R. W. Wolf
By direction

C-O-P-Y

APPENDIX (A)

- 3 -

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

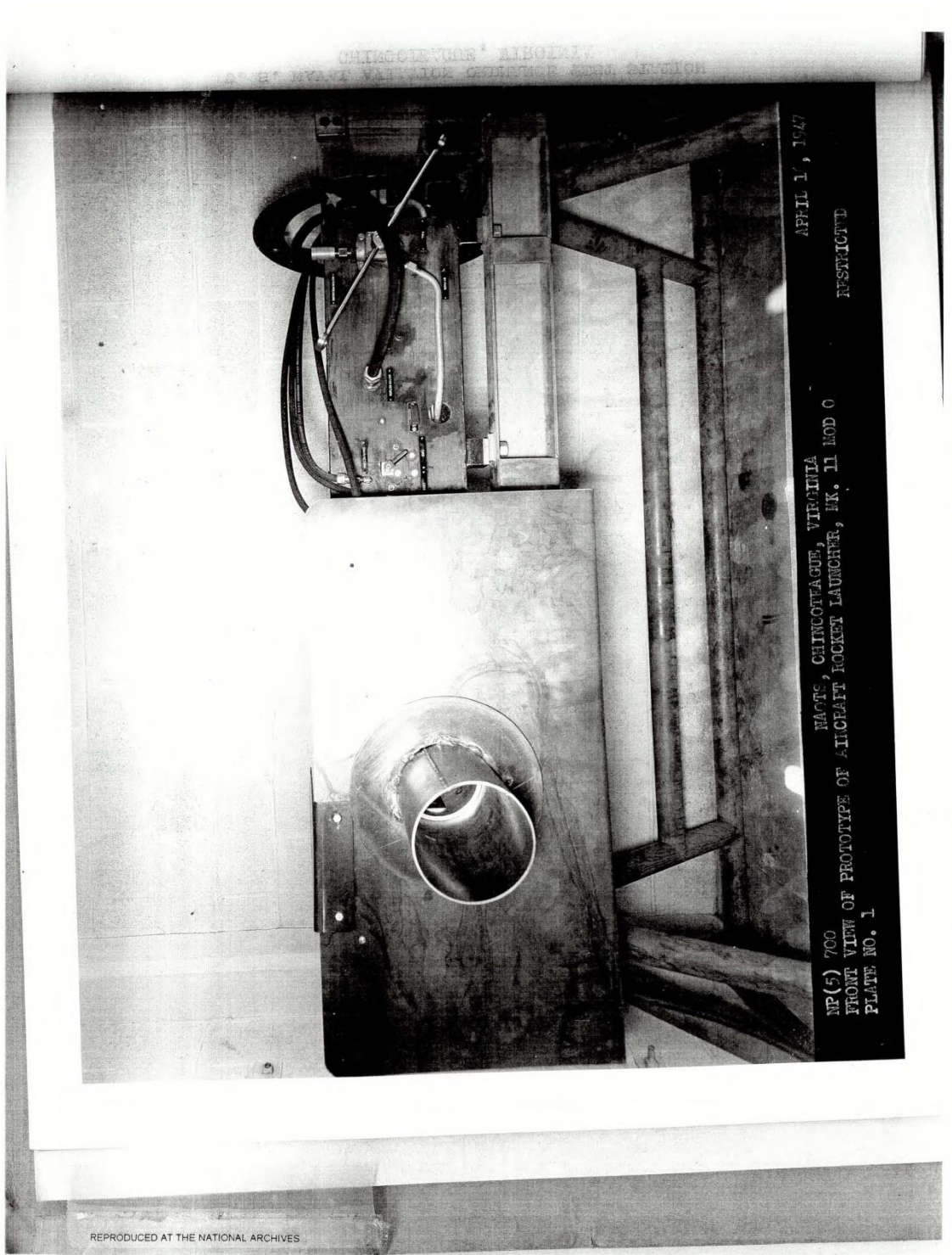
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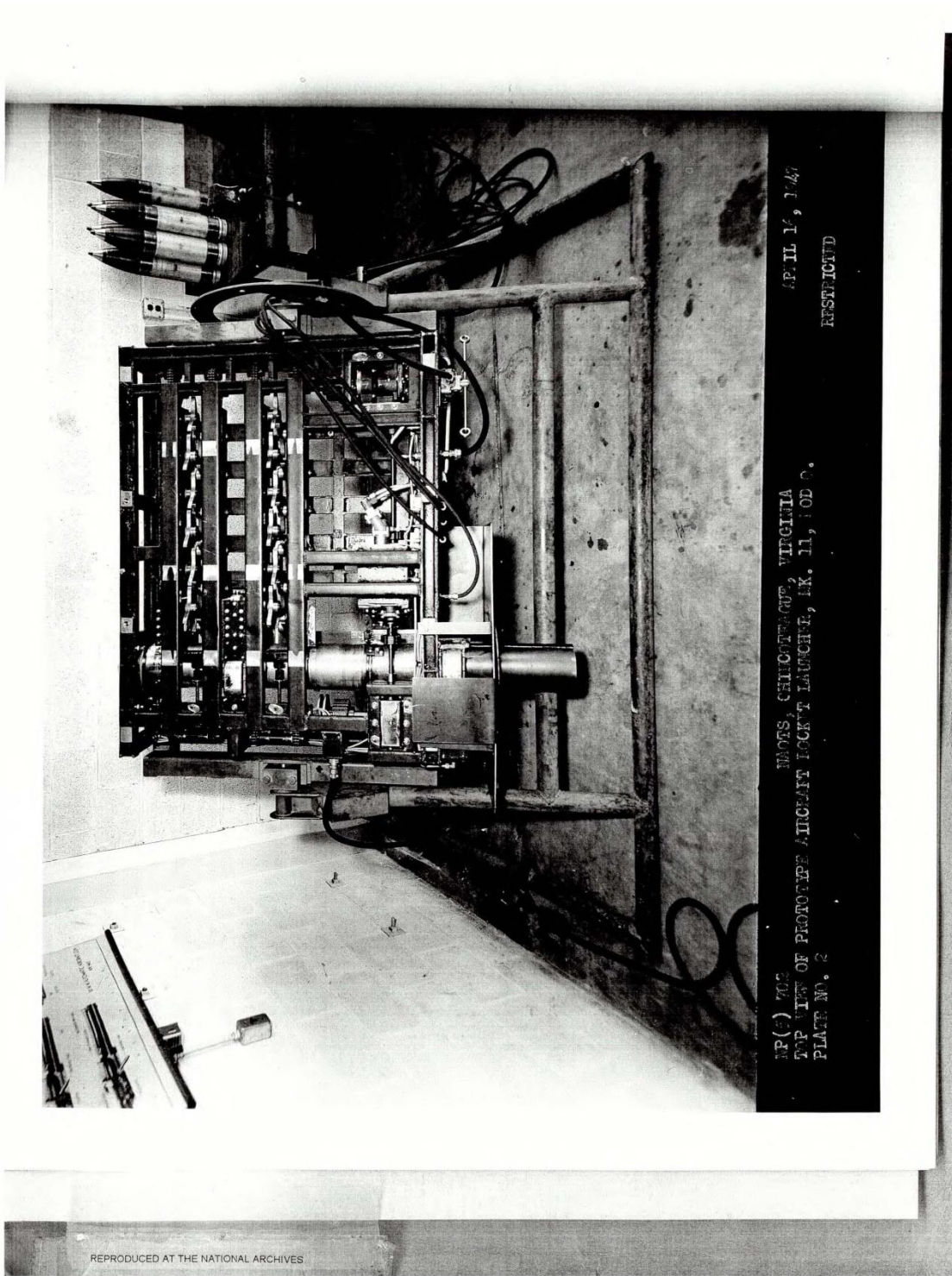
INDEX OF PHOTOGRAPHS

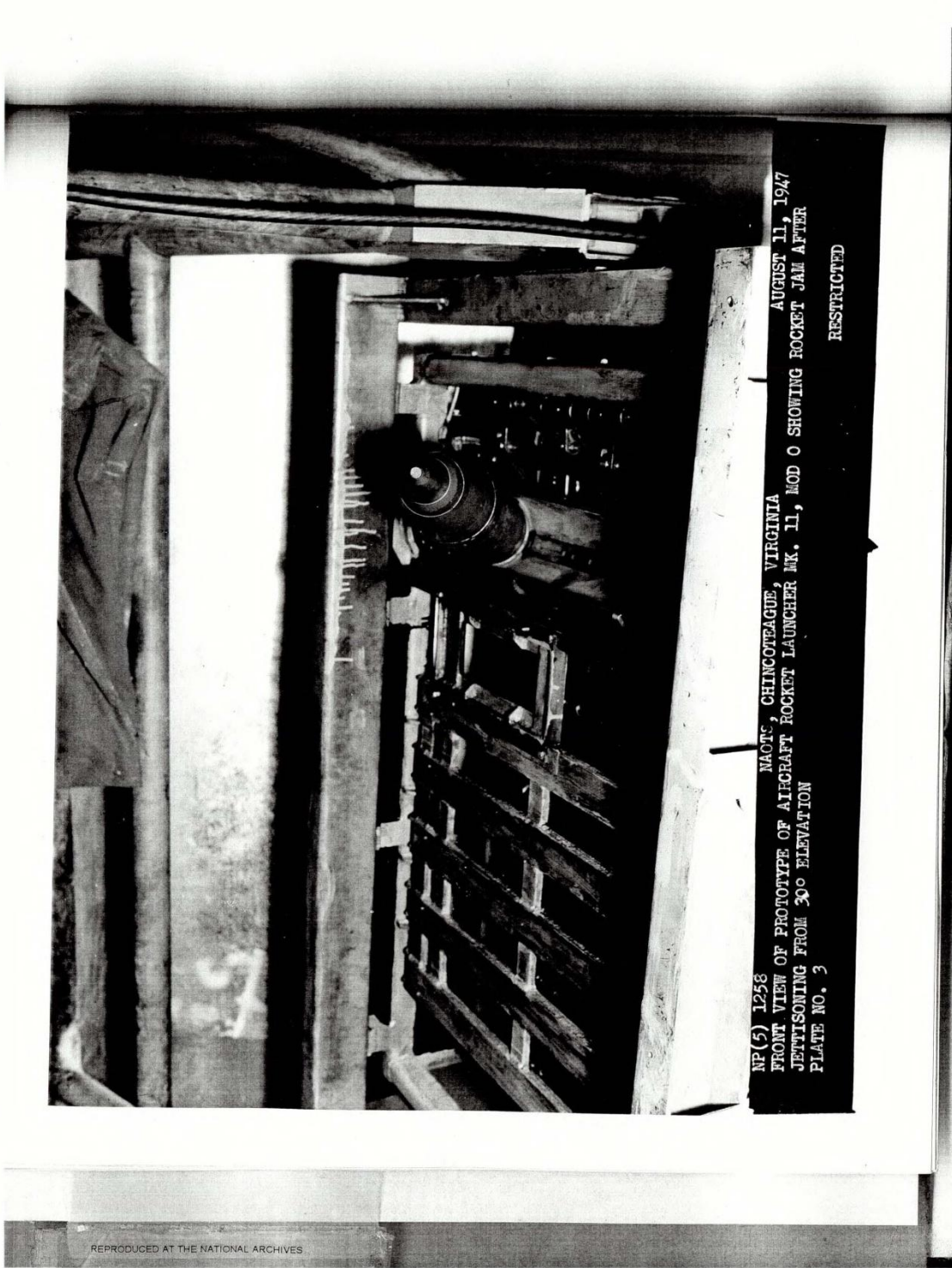
<u>Plate No.</u>	<u>Title</u>
1. N.P.(5) 700	Front view of Prototype of Aircraft Rocket Launcher, Mk 11 Mod 0.
2. N.P.(5) 702	Top view of Prototype Aircraft Rocket Launcher, Mk 11 Mod 0.
3. N.P.(5) 1258	Front view of Prototype of Aircraft Rocket Launcher, Mk 11 Mod 0 showing rocket jam after jettisoning from 30° elevation.
4. N.P.(5) 1259	One quarter view of Prototype of Aircraft Rocket Launcher, Mk 11 Mod 0, showing rocket jam after jettisoning from 30° elevation.
5. N.P.(5) 1260	Three quarter view of Prototype of Aircraft Rocket Launcher, Mk 11 Mod 0, showing rocket jam after jettisoning from 30° elevation.
6. N.P.(5) 1361	Blast angle deflection tubes used in Phase IV of Prototype of Aircraft Rocket Launcher, Mk 11 Mod 0.
7. N.P.(5) 1362	40° angle blast deflection tube installed on Prototype of Aircraft Rocket Launcher, Mk 11 Mod 0.

APPENDIX (B)

- 1 -

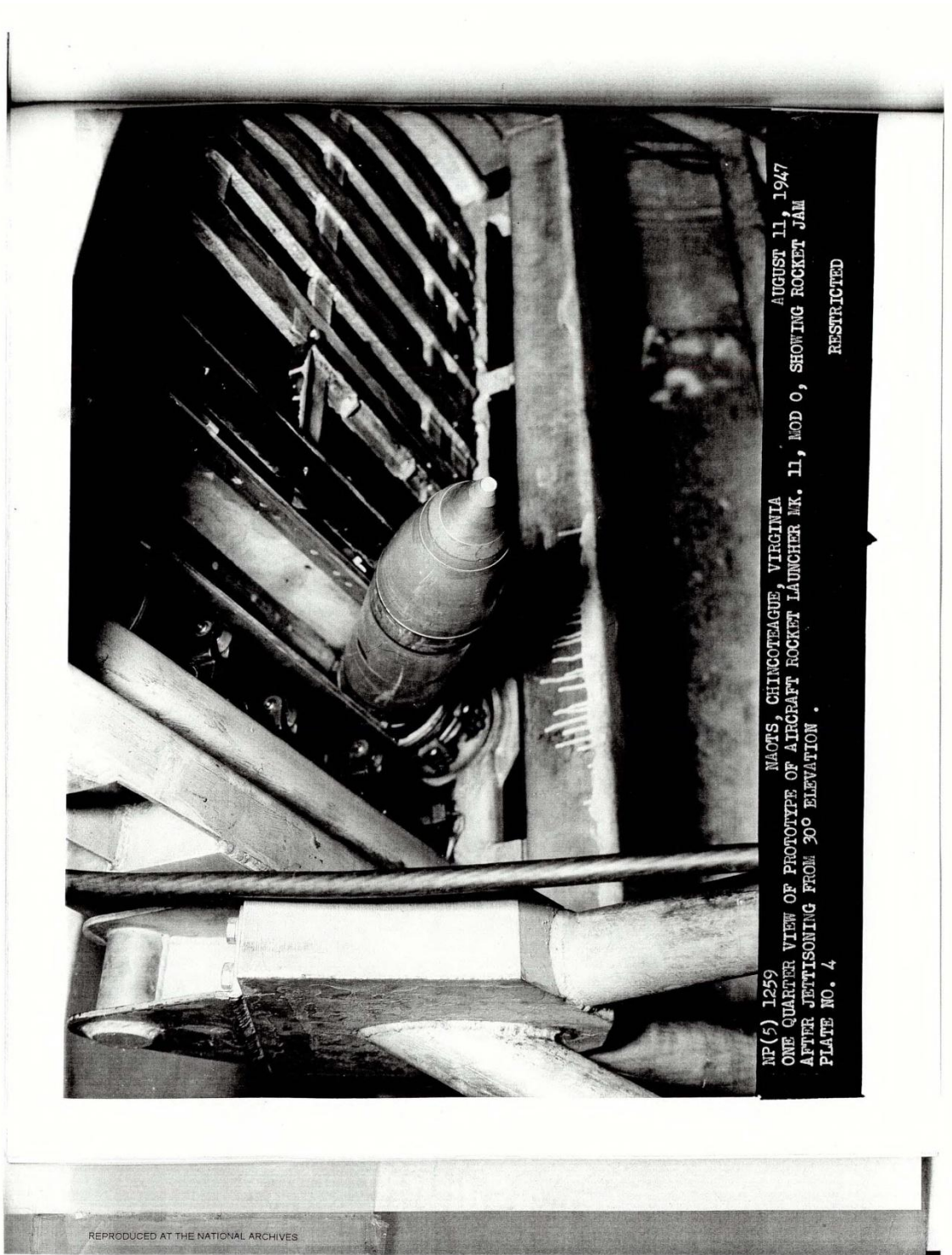


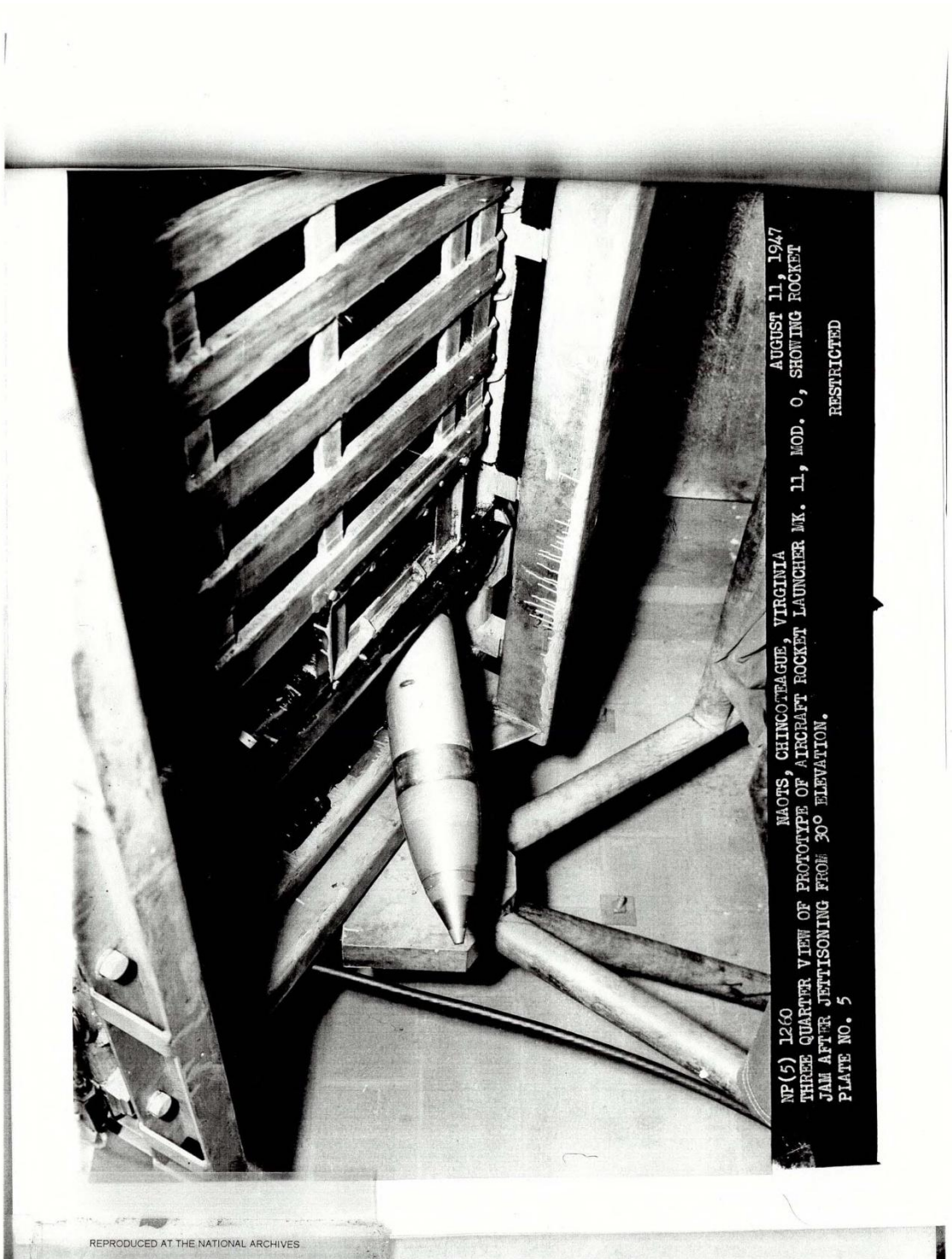


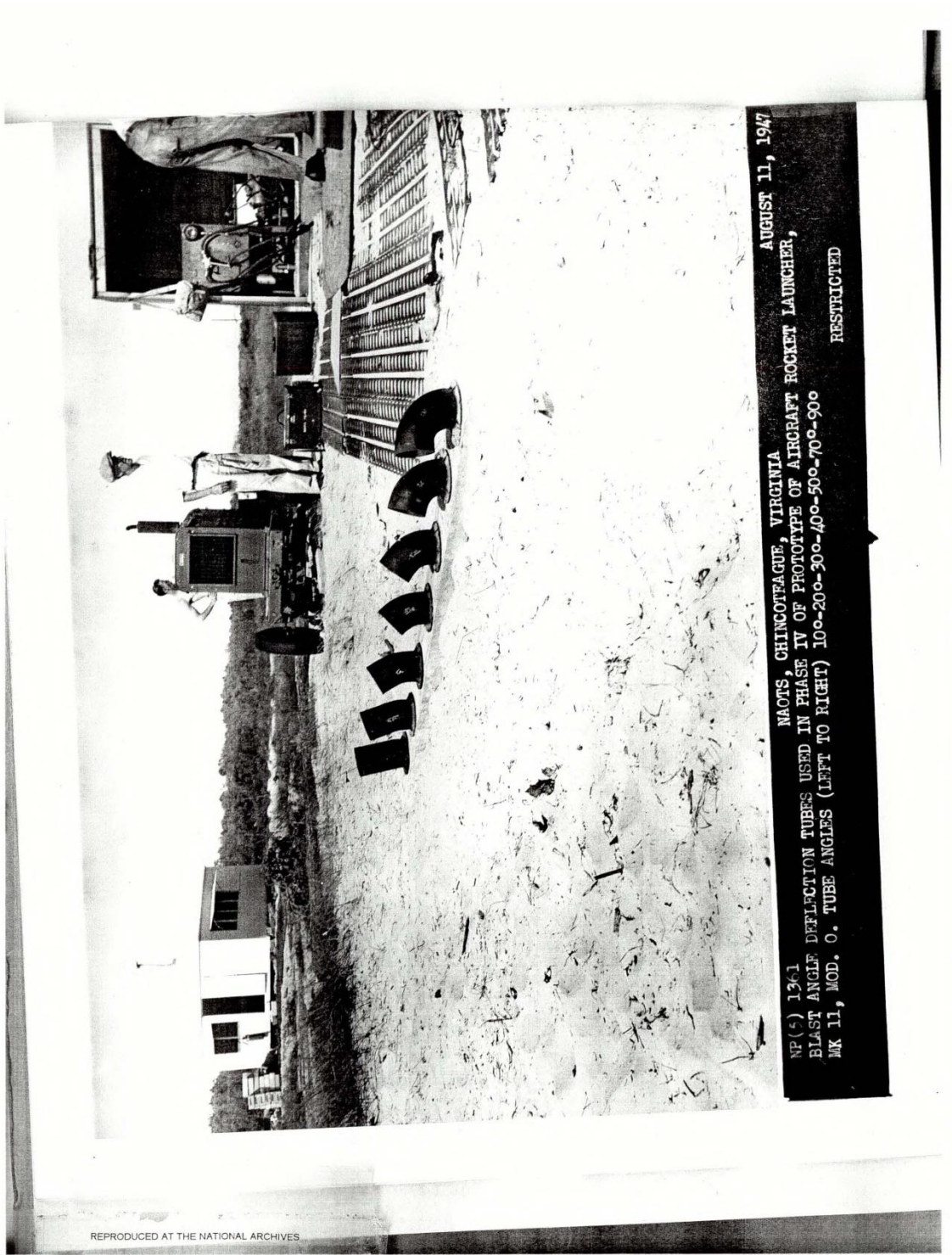


NP(5) 1258 MACTC, CHINGOTEAGUE, VIRGINIA AUGUST 11, 1947
FRONT VIEW OF PROTOTYPE OF AIRCRAFT ROCKET LAUNCHER MK. 11, MOD O SHOWING ROCKET JAM AFTER
JETTISONING FROM 300 ELEVATION
PLATE NO. 3
RESTRICTED

REPRODUCED AT THE NATIONAL ARCHIVES







W-6 U.S. Naval Aviation Ordnance Test Station.

1948 Final Report on Development Firing of 20mm Aircraft Gun EX-1 (T55), T-2 (Prototype MK 9 MOD 0), Task No. NAOTS 18-Re8a-21-2, dated November 18. Record Group 74; Box 865; National Archives, College Park, MD.

815359

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NAOTS
TASK-18-Re8a
21-2
C1

Ad-
Re8a

FINAL REPORT


ON

NAVY DEPARTMENT
BUREAU OF ORDNANCE
TECHNICAL LIBRARY

✓ DEVELOPMENT FIRING TEST OF 20MM AIRCRAFT
GUN EX-1(T55) T-2 (PROTOTYPE MK 9 MOD 0)

DECLASSIFIED
E.O. 12052, Sec. 5.4
NW26607
By SHJ/KRM Date 10/19/85

NAVY DEPT.
1948 NOV 18 10 35
RECEIVED



Task No. NAOTS 18-Re8a-21-2

U.S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

C.F.

FORM-1145-3-58-87-2M

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U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

NAVY DEPARTMENT
BUREAU OF ORDNANCE
TECHNICAL LIBRARY

NAOTS/AL-1
(ONE4/JMV:ebh)

0247

16 November 1948

~~CONFIDENTIAL~~

From: The Commanding Officer
To: The Chief of the Bureau of Ordnance
Subj: Development Firing Test of 20mm Aircraft Gun EX-1
(T55) T-2 (Prototype Mk 9 Mod 0), Report of.
Refs: (a) BuOrd ltr. NALL ReSa, dated 12 March 1948.
(b) BuOrd ltr. F41-1(HG) ReSa, dated 25 June 1948.
Encl: (A) NAOTS, Chincoteague, Virginia, Confidential
Report NAOTS 18-ReSa-21-2, dated 20 September
1948.

1. The purpose of this test was to make the Prototype Mk 9 Mod 0 20mm Aircraft Gun fire sustained bursts without serious part breakage.
2. It is concluded that the Prototype Mk 9 Mod 0 gun, after modifications made by this Activity, satisfactorily fired sustained bursts without serious part breakage.
3. It is recommended that the modifications to the subject gun, as outlined in Enclosure (A), be studied by a competent engineering agency for possible use in the design of future models of this gun.
4. Task Assignment NAOTS-18-ReSa-21-3 is temporarily inactive pending receipt of further material for test. An interim report is forwarded herewith as Enclosure (A).

W. V. R. Vieweg
W. V. R. VIEWEG

CC:
BuOrd (3)
Naval Gun Factory (1)
NPG, Dahlgren, Va. (1)

REPRODUCED AT THE NATIONAL ARCHIVES

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re8a-21-2 20 September 1948

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NUMBER OF PHOTOGRAPHS IN REPORT..... 6

NUMBER OF PAGES IN REPORT..... 26

- 2 -

ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re8a-21-2 20 September 1948

ABSTRACT

The object of this task was to conduct a developmental and functional firing test of the 20mm Single Barrel Gun EX-1 (T55) T-2, and to make such modifications as necessary to enable the subject gun to fire sustained bursts without serious parts breakage.

Modifications made, incorporated, and proved through firing this weapon, have resulted in satisfactory performance in the firing of sustained bursts without serious parts breakage.

It is recommended that the modifications and suggestions discussed herein be studied, refined, and incorporated in a redesigned firing model of this gun by a competent engineering agency, and re-submitted for further test.

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re8a-21-2 20 September 1948

I. INTRODUCTION

A. DIRECTIVES

The developmental and functional firing test of the 20mm Single Barrel Gun EX-1 (T55) T-2 was initiated by Bureau of Ordnance letter NALL1 (Re8a)-JMJ:wj, dated 12 March 1948; Task Assignment NAOTS-18-Re8a-21-2, chargeable to Ordnance and Ordnance Stores Navy 194 under Project Order No. 7321 Ordnance. Modifications necessary to perform the test were authorized by Bureau of Ordnance letter F41-1 (HG) (Re8a)-JMJ:wj, dated 25 June 1948. See Appendix (A).

B. DESCRIPTION

1. Physical Equipment

The 20mm Single Barrel Gun EX-1 (T55) T-2 is a prototype design firing model of the low profile Mk 9 Mod 0 20mm Aircraft Machine Gun. The Mk 9 gun is to be mounted in the thin wings of late type aircraft. It is an automatic gas-operated weapon, utilizing the pressure of the propellant gases to perform the functions of unlocking, extracting, cocking, loading and locking. The gun is belt fed utilizing Mk 7 20mm links, and fires Standard 20mm ammunition. The feed mechanism operates on the same principles as a standard .50 caliber aircraft machine gun feeder.

2. Operation of Equipment

The 20mm Single Barrel Gun EX-1 (T55) T-2 was set up for firing on a rigid ground mount at an outdoor range. The belted ammunition fed to the gun was supported by a flexible ammunition chute supported in turn by a tray set at right angles to the gun and slightly elevated to ensure positive feed. The gun was initially charged and fired manually since no automatic charging and firing mechanism was furnished with the gun for this test.

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re8a-21-2 20 September 1948

II. CONDUCT OF TEST

A. PLANNED PROCEDURE

It was desired to determine what modifications to the 20mm Single Barrel Gun EX-1 (T55) T-2 were necessary to make it fire sustained bursts without serious parts breakage. In order to obtain this information, the test was conducted in five phases.

PHASE (1) The gun was given a thorough visual inspection prior to firing in an attempt to establish errors in design or manufacture that might produce parts breakage or malfunctioning when fired.

PHASE (2) Make modifications to the gun as believed necessary as a result of the inspection performed in Phase (1).

PHASE (3) Conduct test firing of the gun to prove the modifications made in Phase (2), and to study the operation of the gun in an effort to determine what further modifications were necessary to reduce parts breakage and malfunctioning.

PHASE (4) Make modifications to the gun required as a result of the test firing performed in Phase (3).

PHASE (5) Conduct test firing of the gun to prove the modifications incorporated in Phase (4), and to fire sustained bursts without serious parts breakage if possible.

B. TESTS CONDUCTED AND DISCUSSION

1. The 20mm Single Barrel Gun EX-1 (T55) T-2 was given a thorough visual inspection prior to firing in an attempt to determine errors in design or manufacture that might produce part breakage or malfunctioning when fired. The inspection revealed the following discrepancies: (The corrective modifications, and the result thereof, are discussed with each).

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re8a-31-2 20 September 1948

II. CONDUCT OF THE TEST (Cont'd)

- (a) The end of the gas cylinder piston lacked $3/8$ inch of meeting the forward face of the bolt extension when the bolt extension and piston were in battery position. In this condition, the piston would strike the bolt extension with a terrific impact when thrust rearward by the propellant gas pressure. It is believed that this impact would force the bolt extension back with such severity as to damage the receiver. The thickness of the piston head was reduced by machining the underside of the head until there was a clearance of only .005 inch between the forward face of the bolt extension and the end of the piston. This modification caused the bolt extension to be thrust, rather than hammered rearward during operation. Functioning of the modified gas piston and bolt extension was satisfactory during the test.
- (b) The bolt extension, when forced rearward to unlock the piece, withdrew the firing pin $1 1/8$ inches. This exposed the firing pin tunnel to brass and carbon residue which blows back during firing. A concentration of foreign matter in the firing pin tunnel would result in binding the firing pin, preventing the pin from striking the primer cap with force to cause detonation. A floating type firing pin was designed (see Plate 2442 of Appendix C) that does not retract beyond flush with the face of the bolt.
- (c) With a round in the chambered position for firing, the maximum protrusion of the firing pin was too short to consistently detonate the cartridge primer. Twenty-three thousandths (.023) of an inch was added to the redesigned firing pin. This firing pin functioned satisfactorily during the test.

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NACTS 18-Re8a-21-2 20 September 1948

II. CONDUCT OF THE TEST (Cont'd)

- (d) The orifice between the barrel and the gas cylinder was found to be .25 inch. This opening was believed to be excessive for the high pressures involved, and the function required of that pressure. A series of plugs with gradual orifices from .063 to .159 inch were made (see Plate 2439 of Appendix C), and the gas cylinder sleeve was tapped to receive these plugs at a point where the gas could be metered to the face of the piston. The intention was first to allow the weapon to have just enough gas pressure to operate, and then gradually increase it to satisfactory operating conditions. An orifice of .085 inch appeared to give the most satisfactory results.
- (e) It was observed, when pumping dummy rounds through the gun by hand, that if the link ears did not clear two small spring loaded projections, one in each feeder link guide rail, the round had a tendency to cant to either side and bind in the feeder. These parts, which were serving as belt holding pawls, were removed from the guide rails and substantial external belt holding pawls were designed and secured to the floor of the feeder. (See Plate 2435 of Appendix C.)
2. Development test firing was conducted to study operation of the gun in an effort to determine what modifications were necessary to reduce parts breakage and malfunctioning, and to improve its operation. Parts breakage and malfunctions occurring during the test firing are discussed below, with the corrective modifications made, and the results thereof.
- (a) Eight stoppages were attributed to empty cartridge cases failing to eject. Investigation showed that the slot in the floor of the receiver for ejection of empty cases had only 1/16 inch clearance when a case was passing through it. This required

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~

TASK ASSIGNMENT NAOTS 18-Re8a-21-2 20 September 1948

II. CONDUCT OF THE TEST (Cont'd)

that the case be ejected in near perfect alignment to clear the gun. The inherent vibration of the gun while firing, and the outside forces that would be encountered in a maneuvering plane installation, would aggravate this malfunction. No remedial action was taken to overcome this malfunction for this test. The size of the ejection slot could be increased to correct the situation, but would possibly weaken the barrel extension bearing at this point to such an extent that the part would fail.

- (b) The link guide rails in the feeder were placed in such a manner that by unsnapping a metal top cover, they could be removed and reversed for changing the direction of feed. Although this is a desirable feature, the rails in this installation were so loose, that when the gun was firing, they would lurch severely and at times cause the link ears to hit the edges of the rail slots at the opening and fail to enter. This condition was alleviated by bolting the link guide rails to the floor of the feeder. (See Plate 2434 of Appendix C.)
- (c) The vertical clearance of the link ears to the link guide rail slot was only $3/64$ inch. This close allowance resulted in failure of the ears to enter the slot when the link happened to be canted due to imperfect belt- ing. The inherent whipping of the ammunition belt being fed at high speed into the feeder, further aggravated this malfunction. The link guide rail opening was increased by machining the slots so that the vertical clearance between the link ears and the guide rail slot at the opening was $5/32$ inch. This clearance was gradually reduced to the original slot dimension at a point $1\ 1/2$ inches from the opening (see Plate 2435

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re 8a-21-2 20 September 1948

II. CONDUCT OF THE TEST (Cont'd)

of Appendix C). No further stoppages due to link jams occurred after this modification was made.

- (d) A stoppage which occurred after 73 rounds of intermittent firing was found to be caused by the bronze floor plates of the feeder being bent down and binding the bolt. Progressive bending of the floor plates to the extent that a stoppage resulted, was caused by the force of the incoming rounds on the feeder floor plates while being stripped from the feeder into the receiver. The bronze floor plates were replaced with No. 6 stainless steel (see Plate 2440 of Appendix C). No further bending of the feeder floor plates occurred.
- (e) After firing a total of 106 rounds through the gun, the oil reservoir cap on the oil buffer blew off. This was caused by failure of the weld securing the cap to hold under the severe pressure imposed. An attempt was made to bolt the cap back on the buffer with ten Allen-head 10/32 machine screws, using various gasket materials, but a satisfactory oil seal could not be obtained. In order to continue the test of the gun, an air buffer was improvised to replace the oil buffer. The air buffer functioned satisfactorily during the test.
- (f) After 205 rounds of intermittent firing, two of the four bronze locking lugs on the feeder failed (see Plate 2291 of Appendix C) resulting in a stoppage. This breakage was attributed to metal fatigue. The four locking lugs were replaced using chrome-molybdenum steel in place of bronze (see Plate 2440 of Appendix C). No further failure of these parts occurred.

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-R68a-21-2 20 September 1948

II. CONDUCT OF THE TEST (Cont'd)

C. SUMMARY OF RESULTS

A total of four hundred ninety-eight (498) rounds of 20mm ammunition was fired through the MX-1 (T55) T-2 gun during this test. Fifteen (15) stoppages due to breakage or malfunctioning of the gun were recorded. Four sustained bursts of twenty-five (25) rounds, and four (4) of fifty (50) rounds, were fired without parts breakage after all locally produced modifications had been incorporated in the gun. (See Appendix D.)

- 10 -
ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re8a-21-2 20 September 1948

III. CONCLUSION

A. FACTS ESTABLISHED

1. That the 20mm Single Barrel Gun EX-1 (T55) T-2 after modifications did fire sustained bursts without serious parts breakage. See Appendix (C).
2. That the feeder as furnished with the gun for this test was unsatisfactory.
 - a. The slot openings at the ends of the link guide rails had insufficient vertical clearance to ensure the link ears entering them at all times under normal firing conditions.
 - b. The link guide rail installation did not have sufficient security in the feeder to prevent it from lurching which sometimes caused the link ears to hit the edges of the rail slots at the opening and fail to enter.
 - c. The bronze frame, from which the feeder was manufactured, could not withstand the forces imposed upon it. During the test, stoppages resulted from bent floor plates and broken locking lugs on the feeder.
3. That the weld securing the oil reservoir cap of the buffer furnished with this gun is unsatisfactory. The cap blew off after 104 rounds of intermittent firing.
4. That all modifications incorporated in the gun during this test as a result of prefiring inspection, and study of operation during firing, satisfactorily served their intended purpose.

B. OPINIONS FORMED

1. That the ejection slot in the floor of the receiver is not designed to ensure positive ejection of cartridge cases under all conditions of firing.

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ENCLOSURE (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~ TASK ASSIGNMENT NAOTS 18-Re6a-12-2 20 September 1948

III. CONCLUSION (Cont'd)

2. That the orifice between the barrel and the gas cylinder, which meters gas pressure to operate the gun, was of excessive size (.25 inch) for the high pressure involved and the function required of that pressure. An orifice of .085 inch produced satisfactory operation of the gun.
3. That if redesigned as herein recommended, the Single Barrel Gun EX-1 (T55) T-2, should satisfactorily prove the principles upon which it was designed.

C. RECOMMENDATIONS

1. That the 20mm Single Barrel Gun EX-1 (T55) T-2 be re-submitted for further test after the modifications discussed herein have been studied, refined, and incorporated in a redesigned firing model by a competent engineering agency.
2. That the oil buffer made for this gun be redesigned so as to secure satisfactorily the oil reservoir cap.
3. That the ejection slot in the floor of the receiver be redesigned to ensure positive ejection of cartridge cases under all firing conditions.

- 12 -
ENCLOSURE (A)

REPRODUCED AT THE NATIONAL ARCHIVES

TASK ASSIGNMENT TO
ACTIVITY NAVORD FORM
1839 (Rev. 8-47)

NAVY DEPARTMENT
BUREAU OF ORDNANCE
WASHINGTON 25, D.C.

NALL1
(Re 8a)-JMJ:wj

12 March 1948

From: Chief of the Bureau of Ordnance
To: Commanding Officer
Naval Aviation Ordnance Test Station
Chincoteague, Virginia

Subj: 20mm Automatic Aircraft Gun Mk 9 Mod 0.

1. It is requested that the task assignment described below be undertaken. It is further requested that the Bureau be notified if the desired completion date cannot be met without interference to previous assignments, with information as to how previous assignments will be affected if this date is met and what date can be met without interference.

: TASK ASSIGNMENT NO. :	: ESTIMATED COST :	: DESIRED COMPLETION :
: NAOVS-18-Re 8a-21-2 :	: \$24,000 :	: DATE :
:	:	: 30 September 1948 :
: PROJECT ORDER NO. :	: BUORD LIAISON ENGI- :	: SECURITY CLASSIFI- :
: 7321-Ord :	: NEER :	: CATION :
:	: F. R. Marquardt :	: Confidential :

TECHNICAL DATA AND INSTRUCTIONS:

1. It is requested that the Naval Aviation Ordnance Test Station conduct functional and developmental firing tests of the 20mm Automatic Aircraft Gun Mk 9 Mod 0 in accordance with AN Aircraft Guns Test and Evaluation Procedures Manual.

2. The procurement and installation of necessary test equipment is authorized.

A. G. NOBLE

/s/ W. M. ROMBERGER
By direction

C-O-P-Y

- 1 -

APPENDIX (A)

REPRODUCED AT THE NATIONAL ARCHIVES

NAVY DEPARTMENT
BUREAU OF ORDNANCE
WASHINGTON 25, D.C.

F41-1(HG)
(ReSa)-JMJ:wj

25 June 1948

From: Chief of the Bureau of Ordnance
To: Commanding Officer
Naval Aviation Ordnance Test Station
Chincoteague, Virginia

Subj: 20mm Automatic Aircraft Gun Mk 9 Mod 0.

Ref: (a) BuOrd ltr NA111, dated 12 March 1948, Task
Assignment NAOTS-18-ReSa-21-2.

1. Reference (a) requested that the Naval Aviation Ordnance Test Station, Chincoteague, Virginia, conduct functional and development firing tests on the 20mm Automatic Aircraft Gun Mk 9 Mod 0 in accordance with the AN Aircraft Guns, Test and Evaluation Procedure Manual.

2. In addition, minor modifications may be made to the Mk 9 Mod 0 Aircraft Gun in order to conduct functional and developmental tests.

A. G. NOBLE

/s/ E. Tatom
E. Tatom
By direction

C-O-P-Y

-- 2 --

APPENDIX (A)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

~~CONFIDENTIAL~~

TASK ASSIGNMENT NAOTS-18-Re8a-21-2

20 September 1948

CHRONOLOGICAL RECORD

- A. 19 January 1948 - Received gun and spare parts.
- B. 12 March 1948 - Date of Project letter.
- C. 22 March 1948 - Project letter received.
- D. 23 June 1948 - Commenced prefiring inspection of gun.
- E. 28 June 1948 - Received letter authorizing modifications to gun.
- F. 28 June 1948 - Commenced modifications to gun.
- G. 1 July 1948 - Commenced firing test.
- H. 30 July 1948 - Completed test.

- 1 -

APPENDIX (B)

REPRODUCED AT THE NATIONAL ARCHIVES

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

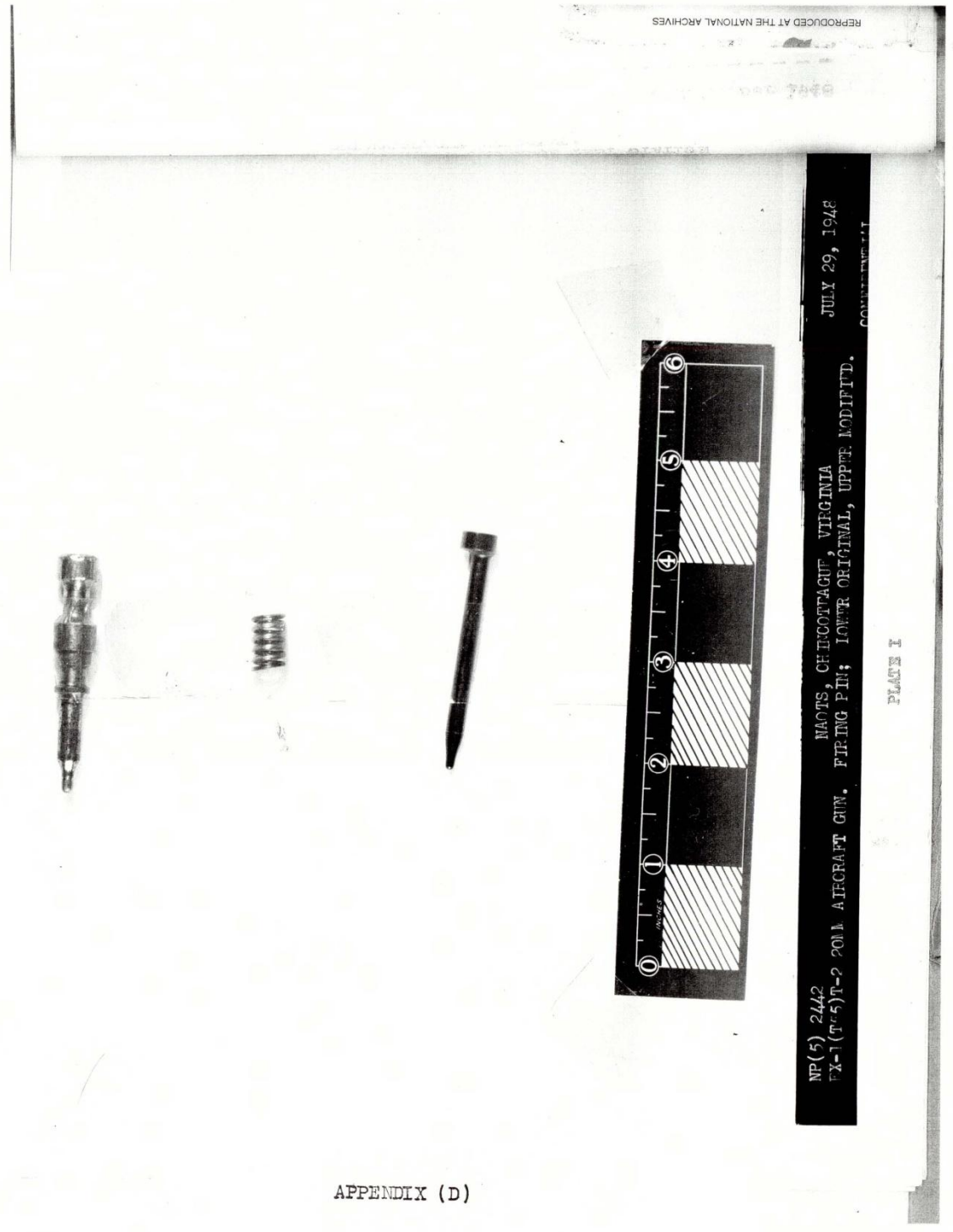
~~CONFIDENTIAL~~

TASK ASSIGNMENT NACTS-18-R8a-21-2 20 September 1948

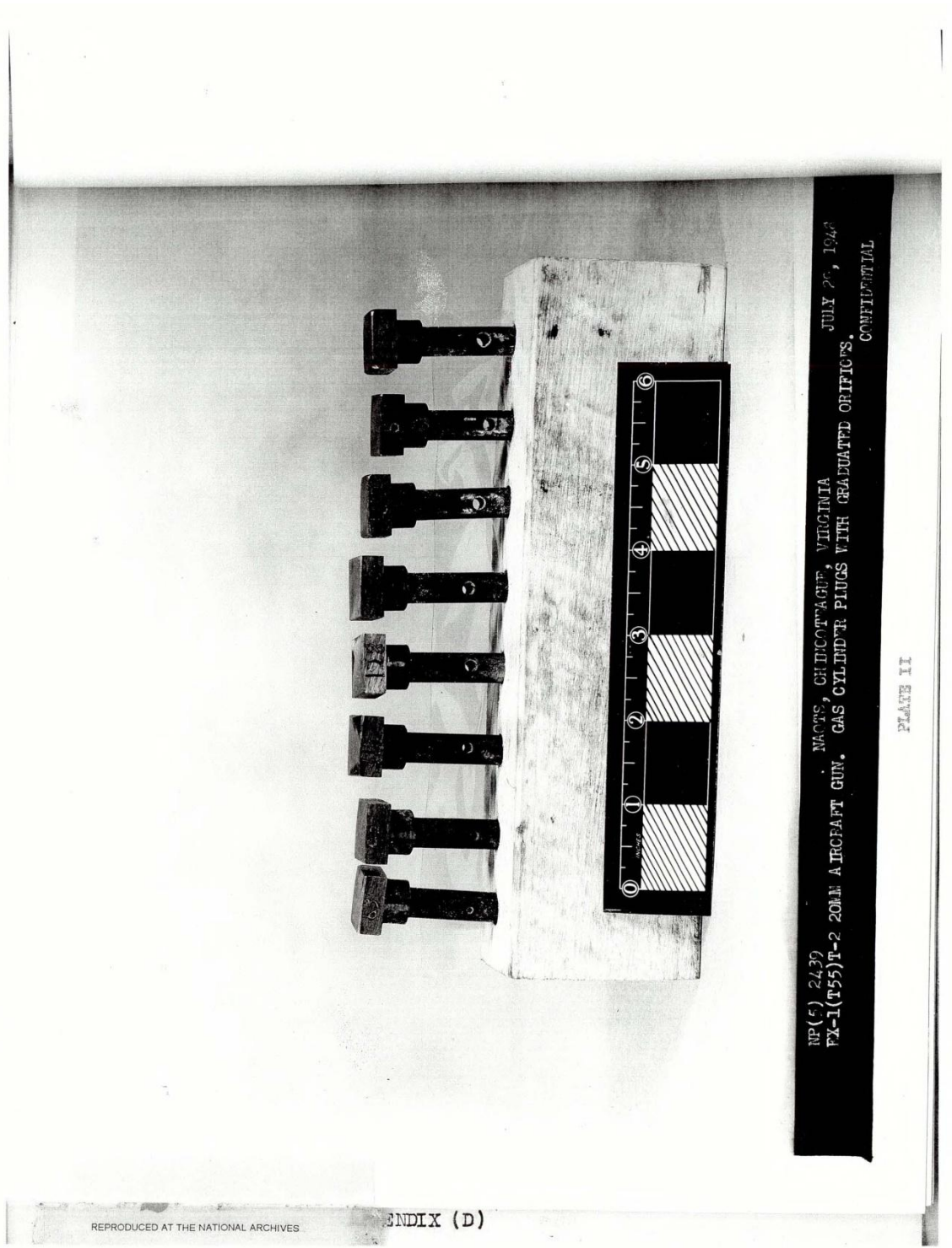
INDEX OF PHOTOGRAPHS

<u>PLATE NO.</u>	<u>TITLE</u>
1. NP(5) 2442	Original and Modified Firing Pins.
2. NP(5) 2439	Gas cylinder plugs with graduated orifices.
3. NP(5) 2435	View of feeder showing modified belt holding pawls and modified link guide rail openings.
4. NP(5) 2434	View of feeder showing link guide rail assembly bolted to floor of feeder.
5. NP(5) 2440	View of feeder showing stainless steel floor plates and chrome-molybdenum locking lugs installed.
6. NP(5) 2291	View of feeder showing cracked and broken bronze locking lugs.

- 1 -
APPENDIX (C)

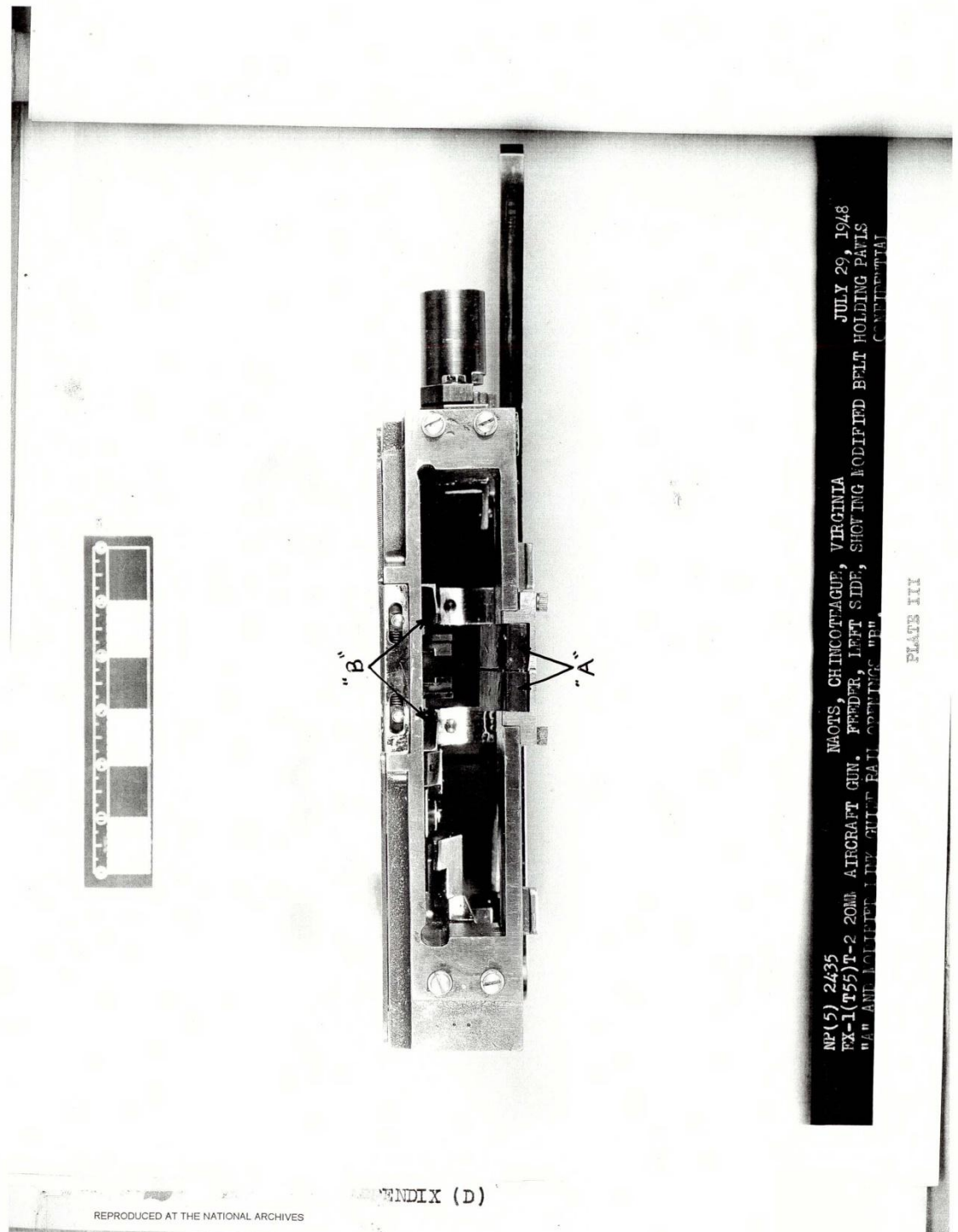


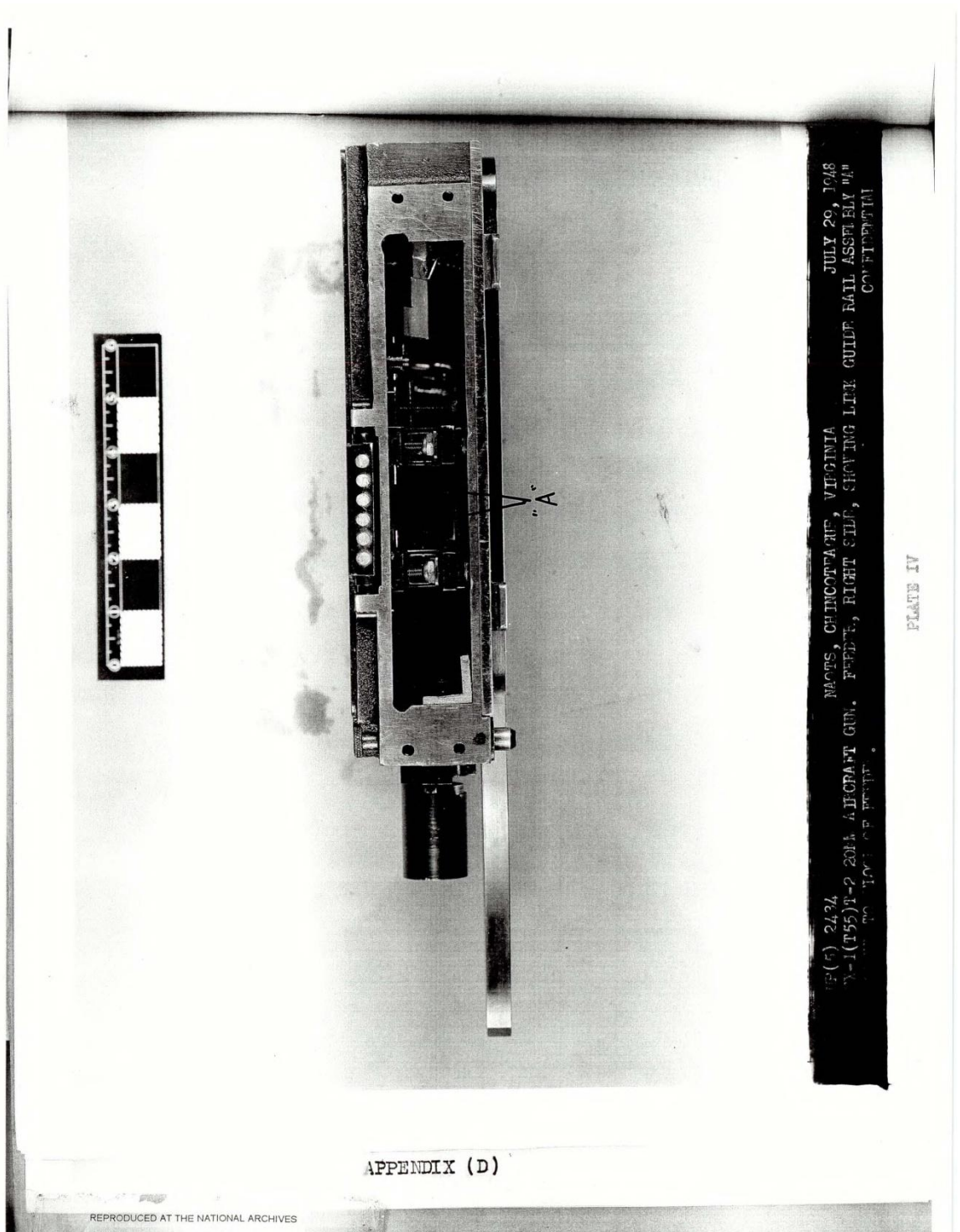
APPENDIX (D)

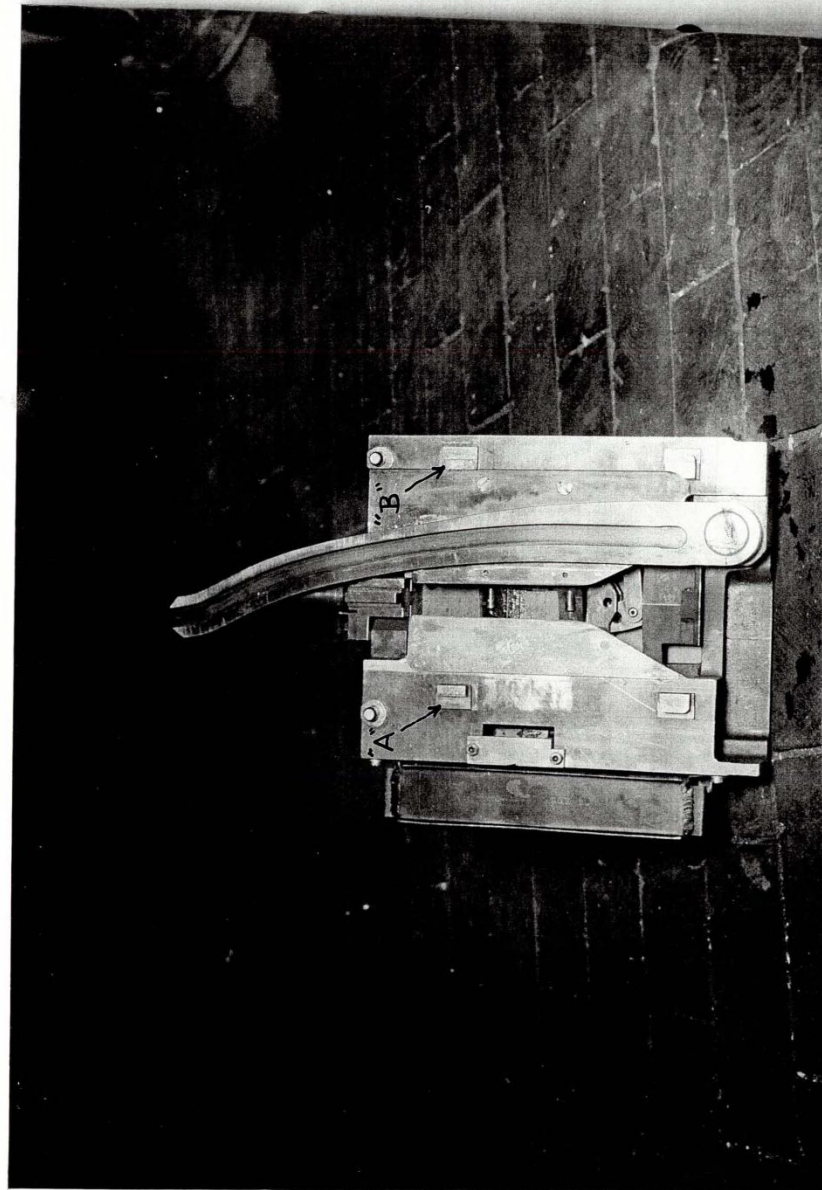


REPRODUCED AT THE NATIONAL ARCHIVES

ENDIX (D)







NP(5) 2291
EX-1(T55)I-2 201# AIRCRAFT GUN.
BUCKEN, BRONZE LOCKING LUGS.
MACTS, CHINCOTHAPE, VIRGINIA
AUGUST 2, 1946
FEEDER, BOTTOM VIEW, SHOWING "A" CRACKED AND "B"
CONFIDENTIAL

PLATE VI

APPENDIX (D)

REPRODUCED AT THE NATIONAL ARCHIVES

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

CONFIDENTIAL TASK ASSIGNMENT NAOTS-18-Re8a-21-2 20 September 1948

FIRING RECORD

<u>No. Rounds</u> <u>Fired</u>	<u>Total Rounds</u> <u>Fired</u>	<u>Performance and Remarks</u>
		1 July 1948
1	1	OK
1	2	OK
1	3	OK
5	8	OK
2	10	Stoppage. Failure to eject.
3	13	OK
3	16	Stoppage. Failure to feed due to link jam.
5	21	OK
12	33	Stoppage. Failure to feed due to link jam.
3	36	OK
4	40	Stoppage. Failure to eject.
1	41	OK
5	46	OK
5	51	OK
3	54	Stoppage. Failure to feed due to link jam.
2	56	OK
5	61	OK

- 1 -

APPENDIX (D)

U. S. NAVAL AVIATION ORDINANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

CONFIDENTIAL TASK ASSIGNMENT NAOTS-18-7e8a-21-2 20 September 1948

FIRING RECORD (Cont'd)

<u>No. Rounds Fired</u>	<u>Total Rounds Fired</u>	<u>Performance and Remarks</u>
1 July 1948		
4	65	Stoppage. Failure to eject.
1	66	OK
7	73	Stoppage. Bolt bind due to feeder floor plates bending.
9 July 1948		
1	74	OK
5	79	OK
5	84	OK
3	87	Stoppage. Failure to eject.
2	89	OK
5	94	OK
10	104	Oil reservoir cap blew off buffer on last round in belt.
13 July 1948		
1	105	Observed leak around oil reservoir cap of buffer.
14 July 1948		

Note: Improvised air buffer utilized for remainder of firing test.

- - 2 - -
APPENDIX (D)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

CONFIDENTIAL TASK ASSIGNMENT NAOTS-18-ReSa-21-2 20 September 1948

FIRING RECORD (Cont'd)

<u>No. Rounds Fired</u>	<u>Total Rounds Fired</u>	<u>Performance and Remarks</u>
		14 July 1948
1	106	OK
5	111	OK
5	116	Stoppage. Failure to eject.
25	141	OK
2	143	Stoppage. Failure to eject.
15	158	OK
4	162	Stoppage. Failure to eject.
24	186	OK
		16 July 1948
1	187	OK
15	202	Stoppage. Feeder jammed due to feeder locking lug fail- ure.
		20 July 1948
1	203	OK
15	218	OK
25	243	OK
		21 July 1948
1	244	OK

- - 3 - -
APPENDIX (D)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINGOTEAGUE, VIRGINIA

CONFIDENTIAL TASK ASSIGNMENT NAOTS-18-Re8a-21-2 20 September 1948

FIRING RECORD (Cont'd)

<u>No. Rounds Fired</u>	<u>Total Rounds Fired</u>	<u>Performance and Remarks</u>
		21 July 1948
25	269	OK
50	319	OK
		22 July 1948
1	320	OK
8	328	Stoppage. Failure to eject.
19	347	OK
50	397	OK
		23 July 1948
1	398	OK
50	448	OK
50	498	OK

- 4 -

APPENDIX (D)

W-7 Directory of U.S. Military Rockets and Missiles.

2005 Fairchild AUM-N-2/AQM-41 Petrel.

Internet <http://www.designation systems.net/dusrm/m-41.html>.

Child AQM-41 Petrel

Page 1 of 3

Directory of U.S. Military Rockets and Missiles

AQM-41

MQM-40
MQM-42

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Fairchild AUM-N-2/AQM-41 *Petrel*

The *Petrel* was an early standoff anti-shipping missile, which was used by the U.S. Navy with moderate success for a brief period in the 1950s, before it was converted to a target drone.

The history of *Petrel* dates back to August 1944, when the U.S. Navy BuOrd (Bureau of Ordnance) initiated the *Kingfisher* project to develop a family of standoff torpedo weapons. This included the *Kingfisher C*, designated as SWOD (Special Weapons Ordnance Device) MK 15, which was to be an air-launched jet-powered torpedo-carrying missile. In late 1947, *Kingfisher C* was designated as **AUM-2** (changed to **AUM-N-2** in early 1948) and renamed *Petrel*. After a long development period, in which several completely different configurations were studied, tests of the **XAUM-N-2** by the Naval Bureau of Standards began in 1951. In 1954, development was transferred to Fairchild, and in April 1956 the **AUM-N-2** finally became operational.



Photo: [The Cradle of Aviation Museum](#)



Photo: i

AUM-N-2

Petrel was essentially a MK 21 homing torpedo, fitted with a nose cone containing the guidance equipment, a Fairchild J44 turbojet, and wooden wings and fins. Despite its AUM (Air-to-Underwater Missile) designation, it was suitable for use against surface ships (and surfaced submarines) only. It was carried by Lockheed P2V-6B *Neptune* aircraft (later redesignated as P2V-6M, and then MP-2F). After launch, it dove to an altitude of about 60 m (200 ft), and continued to the target at a speed of Mach 0.5, using semi-active radar guidance. When it had closed to a distance of about 1400 m (4500 ft), the engine was stopped, all flying surfaces and the engine were discarded, and the torpedo dropped into the water, where it homed on the target.

<http://www.designation-systems.net/dusrm/m-41.html>

10/24/2005

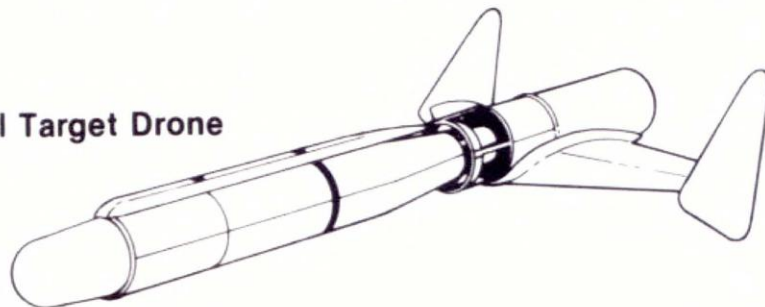


Photo: © Brian Lockett, Goleta Air & Space Museum

AUM-N-2

In the late 1950s, enemy surface ships were considered a relatively minor threat by the U.S. Navy when compared to the Soviet submarine force. Therefore, the *Petrel* wasn't a high-priority weapon, and it was initially assigned to reserve units. The AUM-N-2 had also severe operational shortcomings. Its rather low speed and semi-active guidance required the launching aircraft to come relatively close to the target, which would have made the use of *Petrel* against ships with sophisticated air defenses problematic. In January 1959, the AUM-N-2 was withdrawn from the operational inventory. Existing *Petrel* airframes were then used as air-launched target drones, but were not redesignated in the KD (Target Drone) series.

Petrel Target Drone



Drawing: Kevin Wornkey

AQM-41A (without wings)

In June 1963, the remaining *Petrel* targets were redesignated as **AQM-41A**, but the last of the *Petrels* was probably gone soon after.

Fairchild AQM-41 Petrel

Page 3 of 3

Specifications

Note: Data given by several sources show slight variations. Figures given below may therefore be inaccurate!

Data for **AUM-N-2 (AQM-41A)**:

Length	7.31 m (24 ft)
Wingspan	4.06 m (13 ft 2 in)
Diameter	61 cm (24 in)
Weight	1700 kg (3800 lb)
Speed	600 km/h (325 kts)
Range	32 km (20 miles)
Propulsion	Fairchild J44 turbojet; 4.4 kN (1000 lb)
Warhead	AUM-N-2: MK 21 homing torpedo; 900 kg (2000 lb) AQM-41A: none

Main Sources

- [1] Norman Friedman: "US Naval Weapons", Conway Maritime Press, 1983
- [2] Frederick I. Ordway III, Ronald C. Wakeford: "International Missile and Spacecraft Guide", McGraw-Hill, 1960
- [3] Bill Gunston: "The Illustrated Encyclopedia of Rockets and Missiles", Salamander Books Ltd, 1979
- [4] Norman J. Bowman: "The Handbook of Rockets and Guided Missiles", Perastadion Press, 1963

Back to [Current Designations Of U.S. Unmanned Military Aerospace Vehicle](#)

Back to [Directory of U.S. Military Rockets and Missiles](#)

Last Updated: 17 September 2005

W-8 Directory of U.S. Military Rockets and Missiles.

2005 Eastman Kodak ASM-N-4 Dove.

Internet <http://www.designation systems.net/dusrm/app1/asm-n-4.html>.

Directory of U.S. Military Rockets and Missiles
Appendix 1: Early Missiles and Drones

ASM-N-4

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Eastman Kodak ASM-N-4 Dove

In April 1944, a Naval version of the U.S. Army Air Force's *VB-6 Felix* guided vertical bomb was approved, and the project was named *Dove*. Development was transferred to Eastman Kodak in July 1946, and the *Dove* was subsequently designated as air-to-surface guided missile **ASM-4** (September 1947) and finally **ASM-N-4** (early 1948). Development of the weapon's infrared guidance device apparently took some time, and it was not before 1949 that a contract for 20 **XASM-N-4** prototypes was awarded.

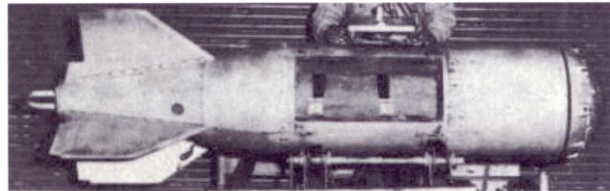


Photo: via Ordway/Wakeford

XASM-N-4

The XASM-N-4 was basically a standard AN-M65 450 kg (1000 lb) general-purpose free-fall bomb, which was fitted with a simple heat-seeking device in the nose and control fins in the tail. The *Dove* could be dropped from unusually high (for a free-fall bomb) altitudes of up to 9100 m (30000 ft), because the seeker could correct aiming errors of up to 400 m (1/4 mile). Because it didn't use any significant lift devices, the XASM-N-4 was effectively a vertical bomb with no significant standoff range. The bomb was to be used against targets with a clear infrared signature, like ships in the open sea or isolated industrial plants.

Testing of the XASM-N-4 prototypes by the Bureau of Ordnance was completed in October 1952, but no follow-on production orders were placed.

Specifications

Note: Data given by several sources show slight variations. Figures given below may therefore be inaccurate!

Data for **XASM-N-4**:

Length	2.51 m (8 ft 3 in)
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<http://www.designation-systems.net/dusrm/app1/asm-n-4.html>

10/24/2005 w-8

Eastman Kodak ASM-N-4 Dove

Page 2 of 2

Finspan	57.4 cm (22.6 in)
Diameter	47.6 cm (18.8 in)
Weight	610 kg (1350 lb)
Speed	Mach 0.98
Propulsion	none
Warhead	450 kg (1000 lb) AN-M65 general-purpose bomb

Main Sources

- [1] Norman Friedman: "US Naval Weapons", Conway Maritime Press, 1983
- [2] Frederick I. Ordway III, Ronald C. Wakeford: "International Missile and Spacecraft Guide", McGraw-Hill, 1960
- [3] Bill Gunston: "The Illustrated Encyclopedia of Rockets and Missiles", Salamander Books Ltd, 1979

Back to [Directory of U.S. Military Rockets and Missiles, Appendix 1](#)

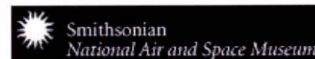
Last Updated: 22 January 2003

W-9 NASM Space Artifacts.

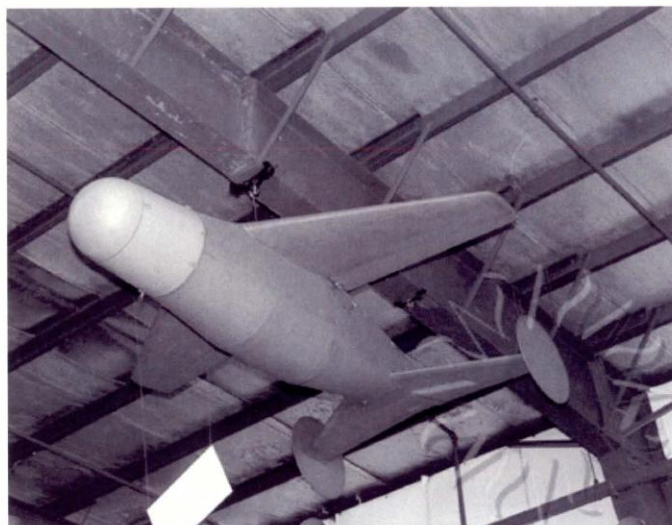
2005 Bat Air-to-Surface Missile.Internet

<http://www.nasm.si.edu/research/dsh/artifacts/RM-Bat.html>

Rockets and Missiles



Bat Missile



Source: SI 91-1340636

Bat Air-to-Surface Missile

The Bat was one of the most sophisticated U.S. missiles of World War II. The Bat was a glide bomb carried by a Navy PB4Y-2 Privateer patrol bomber or other aircraft and was designed to destroy ships and off-shore enemy targets. It was not rocket-propelled but is still considered an early guided missile because it employed a radar homing device which guided the missile to its target. Visual contact with the target was not required. Like a bat, after whom it was named, the missile transmitted pulses and listened for their reflections from the target. The Bat was launched from its carrier aircraft flying as high as 15-25,000 feet and was released when within a 15-20 mile range of its target. The Bat carried a 1,000 lb General Purpose (GP) bomb warhead. The Bat was steered by controllable tail elevator driven by autopilot servo motors linked to small wind-driven generators and to the radar guidance system. The missile also had fixed wings and was also gyro-stabilized. The Privateer carried two Bat missiles underneath each wing rack. The launching speed of the parent aircraft was 140-210 knots. Western Electric Co. was responsible for the radar and Bendix Aviation Corp. for the gyro.

Dimensions:

<http://www.nasm.si.edu/research/dsh/artifacts/RM-Bat.htm>

10/24/2005 W-9

NASM Space Artifacts: Bat Missile

Page 2 of 3

L: 11 ft 11 in.
Span: 10 ft.
Empty weight: 600 lbs.
Loaded weight: 1,600 lbs.

Description:

A high wing monoplane with a rounded nose, horizontal stabilizer and twin vertical fins.

History:

The Bat missile grew out of the Dragon program, proposed in January, 1941, by RCA. The Dragon concept was a TV-guided anti-surface ship aerial torpedo. The National Bureau of Standards were to provide the airframe. The airframe was developed but the German U-boat threat had become serious enough that plans for the missile were altered which led to the initiation of the Pelican missile in June, 1942. The anti-submarine Pelican glide bomb was to be armed with depth charges, and guided by a semi-active radar system in which the radar was carried in the parent aircraft. In mid-1943, the Pelican project changed again. It now became an anti-ship missile with a larger, 2,000 lb GP bomb and radar homing, though testing on the Pelican continued with two of four rounds striking their target ship offshore from the Naval Air Station, New York, in July 1944. In September, the project was cancelled and supplanted by a new missile, the Bat, which adopted the original National Bureau of Standards airframe.

Development of the Bat was supervised by the Navy's Bureau of Ordnance in partnership with the Massachusetts Institute of Technology (MIT), with the National Bureau of Standards in charge of the overall development. MIT's Dr. Hugh L. Dryden later won the Presidential Certificate of Merit for the development of the Bat. Flight tests were conducted at the Naval Air Ordnance Test Station at Chincoteague Island, Va. The Bat eventually saw combat service from May, 1945, off Borneo and destroyed several Japanese ships including a destroyer sunk at a 20 mile range. Several Bat missiles were also fitted with modified radar systems and destroyed Japanese-held bridges in Burma and other areas. The Bat was also designated ASM-N-2 and Swod (Mk 9 Mod 0 and 1). Thousands of Bat missiles were produced and went through several modifications.

The National Bureau of Standards donated this particular Bat to the National Air and Space Museum in June, 1950.

References:

U.S. Navy Dept., Bureau of Aeronautics report, pilotless aircraft, ca. 1945.

Bill Gunston, *The Illustrated Encyclopedia of the World's Rockets & Missiles* (Crescent Books: New York, 1979), p. 120.

Frederick I. Ordway, III and Ronald C. Wakeford, *International Missile and*

<http://www.nasm.si.edu/research/dsh/artifacts/RM-Bat.htm>

10/24/2005

NASM Space Artifacts: Bat Missile

Page 3 of 3

Spacecraft Guide (McGraw-Hill Book Co., Inc.: New York, 1960), pp. 117-118.

Civilian Space Applications	Guidance, Navigation, and Control	Humans in Space	International Space	Military Space	Rockets and Missiles	Space Science	NASM Home Page
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This page updated: 08/18/99
Author: Space History Division
[E-mail Inquiries](#)

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W-10 Navy Department, Washington, DC.

1944 Correspondence to The Attorney General, dated 28 September, regarding acquisition of land for a Naval Ordnance Aviation Test Station to be used in connection with the Naval Auxiliary Air Station, Chincoteague, Virginia. Record Group 74; Entry 25V; Box 300; Folder NI-13; National Archives, College Park, MD

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ADDRESS REPLY TO

AND REFER TO INITIALS

AND NO.
ND5/N1-13
C48-49-Ch
F-5-3/BM:mr

NAVY DEPARTMENT
WASHINGTON 25, D. C.



7105

September 28, 1944

The Honorable
The Attorney General

N1-13
AD3

Sir:

Pursuant to the authority of the Second War Powers Act of Congress approved March 27, 1942 (Public Law 507, 77th Congress) and the Act approved August 6, 1942 (Public Law 700, 77th Congress), the Secretary of the Navy has selected for acquisition 91.70 acres of land, more or less, in Accomack County, Virginia, for a Naval Ordnance Aviation Test Station to be used in connection with the Naval Auxiliary Air Station, Chincoteague, Virginia.

100144 00132

The lands to be acquired are more particularly described in the enclosed Exhibit "A", and are delineated on a map dated September 16, 1944, entitled "Sketch of 91.70 acres southwest of Chincoteague Field, Accomack County, Virginia," enclosed herewith as Exhibit "B".

It is requested that condemnation proceedings be instituted to acquire these lands in fee simple, subject to existing public utility easements, and subject to existing public rights in boundary roads and streets, and that an order of the court be obtained granting immediate possession of the lands.

The ostensible owner of the lands is Beulah Fisher, Wattsville, Virginia.

Very truly yours,
Acting Ralph A. Bant

- Encls. (HW)
1. Description, Exhibit "A"
2. Map, Exhibit "B"

CC: Com5
BuOrd ←

Prepared by
Lt. Comdr Brockett Muir
Budocks

W-10

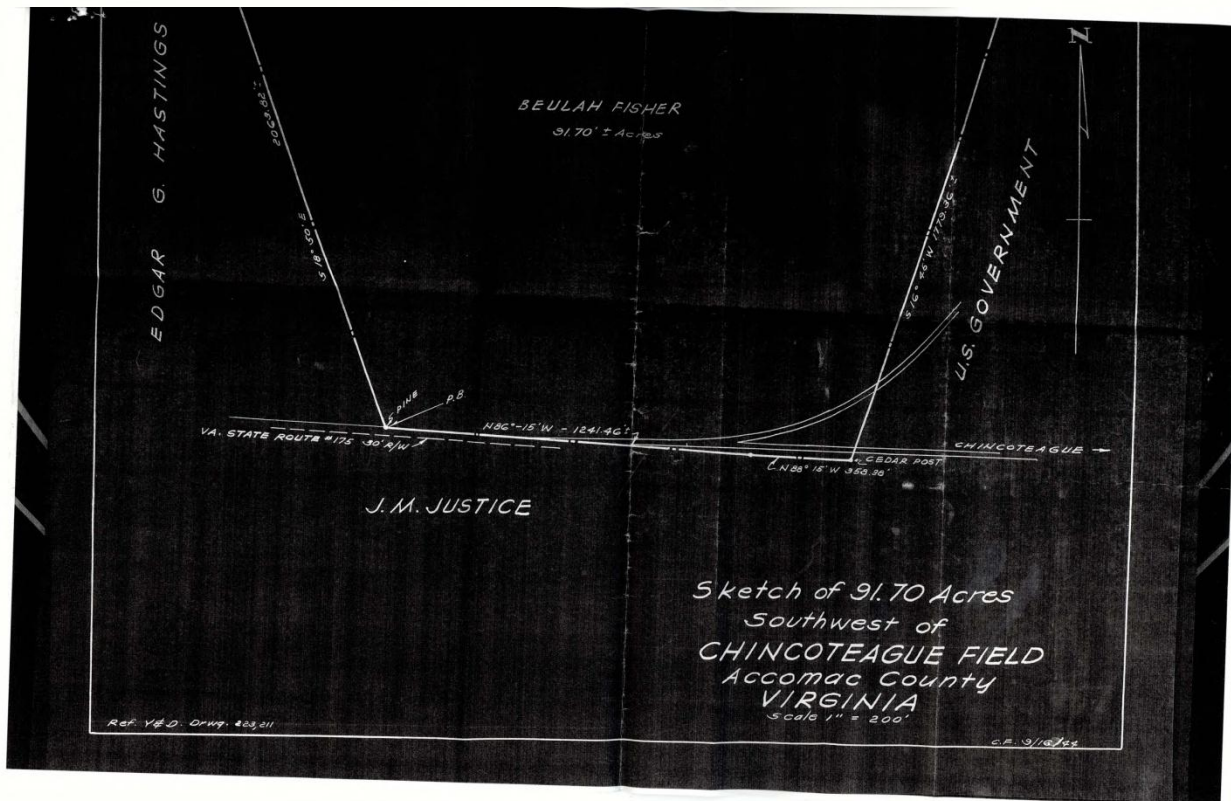
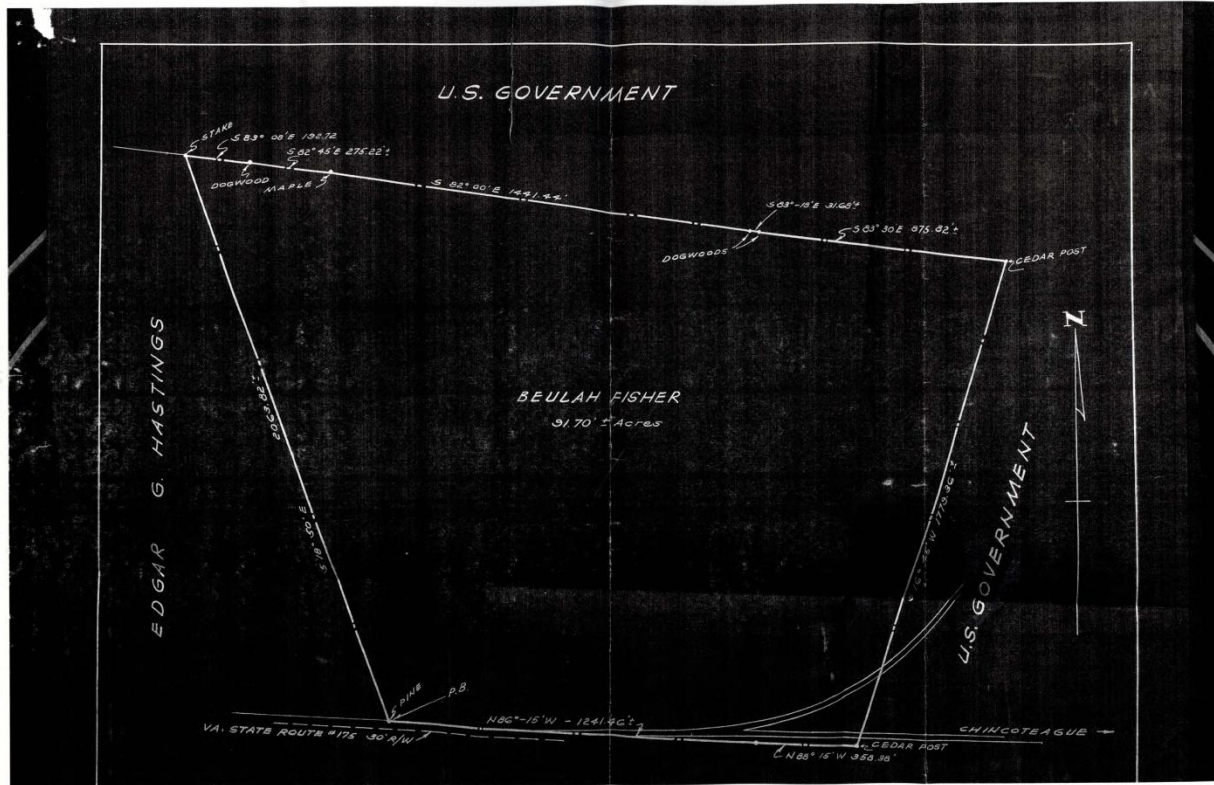
91.70 ACRES OF LAND, MORE OR LESS,
LOCATED IN ACCOMACK COUNTY, Virginia.

All that land lying and being situate in Accomack County, Virginia, more particularly described as follows:

BEGINNING at a corner common to the land of J. M. Justice, land of Beulah Fisher and land of the United States of America (Chincoteague Naval Auxiliary Air Station); thence N. 89° 15' W. by land of J. M. Justice, 358.38 feet; thence N. 86° 15' W. continuing by said land of J. M. Justice, 1241.46 feet to a corner common to land of J. M. Justice, land of Edgar G. Hastings and land of Beulah Fisher; thence N. 18° 50' W. by land of Edgar G. Hastings, 2063.82 feet, more or less, to a corner common to land of Beulah Fisher, land of Edgar G. Hastings and land of the United States of America (Chincoteague NAAS); thence by land of the United States of America (Chincoteague NAAS) the following courses and distances: S. 83° 08' E., 192.72 feet; S. 82° 45' E., 275.22 feet; S. 82° 00' E., 1441.44 feet; S. 83° 18' E., 31.68 feet; S. 83° 30' E., 875.82 feet and S. 16° 45' W., 1779.36 feet to the point of beginning, containing 91.70 acres, more or less, as shown on that certain plat entitled "Sketch of 91.70 Acres, Southwest of Chincoteague Field, Accomack County, Virginia," dated 9/16/44.

Exhibit "A"

100144



W-11 U.S. Naval Aviation Ordnance Test Station.

1947 Correspondence to the Chief of the Bureau of Ordnance, dated 20 January, regarding SWOD MK 9 Med O Med 1 “Bat” Evaluation Test and Training Program, Report of. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

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DECLASSIFIED
Authority *MVD 992597*
By *BT* NARA Date *10/20/05*

IN REPLY
REFER TO **NAOTS/AL-1(4)**
Address **(ON24/WDD:s) U. S. NAVAL AVIATION ORDNANCE TEST STATION**
Commanding Officer **CHINCOTEAGUE, VIRGINIA**

03

20 JAN 1947

"CONFIDENTIAL"

From: The Commanding Officer
To: The Chief of the Bureau of Ordnance
Subj: SWOD MK 9 Mod 0 Mod 1 "Bat" Evaluation Test and Training Program - Report of
Refs: (a) NBS ltr VI-7 dated 11 September 1946
(b) BuOrd ltr N111 (Re9e) dated 23 September 1946
(c) BuOrd ltr N111 (Re9e) dated 9 September 1946
(d) VF104 dispatch 102015Z of December 1946
(e) NAOTS dispatch 111800Z of December 1946
Encl: (A) "Bat" Indoctrination NAOTS Officer Personnel
(B) Tabulation "Bat" Unit Flights
(C) Heavy Patrol Squadron FOUR conf. ltr VP-HL-4/A9-8, Serial No. 417 dated 12 December 1946 (less enclosures)

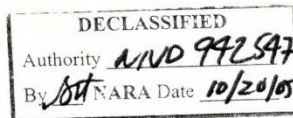
1. In accordance with references (a), (b) and (c), this Command inaugurated and conducted the following programs, all phases of which have been completed with the exception of program (e) which is now in the final phase of production:

- (a) Flight Training in the use of "Bat" for personnel designated by the Bureau of Aeronautics
- (b) Evaluation of the accuracy of the "Bat"
- (c) Collaborated in the filming of "Bat" training film by the Photographic Service Center, Anacostia

2. Program (a) was conducted in conformance with the outline submitted as Enclosure (A) to reference (c). Each officer and man in attendance participated in a minimum of one (1), but, in most cases, two (2), or more actual drops. A minimum of ten (10) hours actual time in flight, with "Bats" aboard and operating, was completed by each pilot and crew. In addition, officer personnel of this Station, listed on Enclosure (A), were qualified in the flight operations of the "Bat".

3. Prior to the arrival of the trainees at Chincoteague, they had been instructed in the broad technical aspects of service and maintenance of the "Bat" at the Massachusetts Institute of Technology and the National Bureau of Standards. Accordingly, emphasis was placed upon the thorough indoctrination of personnel in the meticulous inspection and servicing of each unit used. It is believed that all Ordnance and Electronics personnel in attendance developed a strong sense of responsibility for and pride in excellent workmanship; and such personnel may be used effectively to provide a nucleus of...

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IN REPLY

REFER TO

Address

Comma

NAOTS/AL-1(4)
(0824/000:s)

U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

03

Subj: SWOD MK 9 Mod 0 Mod 1 "Bat" Evaluation Test and Training Program -
Report of

"CONFIDENTIAL"

instructors for the schooling of additional personnel in the servicing and maintenance of SWOD Mk 9 units. The effectiveness of this training was demonstrated during the course of instruction in that the percentage of inoperative units returned from flights was reduced from a high of 50% to the point where in six (6) flights no units were returned as a result of malfunctioning.

4. While all phases of the outlined training program were completed, it is recommended that action be initiated to expand the training given and provide for:

- (a) Training the crews of individual planes as teams in the tactical use of the "Bat" as a service weapon. This should include specifically the selection of targets, approach courses, speeds and altitudes, and the coordination of all available facilities such as radar and other search equipment.
- (b) Additional training of all personnel in the technique of decalage setting. Although the Ordnance personnel were thoroughly qualified, further instruction of the remainder of the personnel is desirable.

5. Malfunctions and difficulties experienced and the adjustments required are listed below:

- (a) Breakaway Connections: Breakaway pins became unseated easily. The investigation, development and adoption of a new type plug is recommended.
- (b) Electrical leakage at the breakaway plug spacer: That condition may be remedied by the use of #4 Dow Corning Ignition sealing compound.
- (c) Radar Width: Four Mod 0 units required adjustment. All Mod 1 units were reset on 1: 1.2 basis as specified by M.I.T.
- (d) Receiver sensitivity: During the final check the sensitivity of the majority of units was found to be low despite the fact that they had previously been tuned. Retuning was necessary.

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Authority *NWD 992597*
By *BT* NARA Date *10/20/05*

Y992597
REF ID: A66666
12 1967

IN REPLY
REFER TO **NAOTS/A1-1(4)**

Address **(ON24/WDD:nJ) S. NAVAL AVIATION ORDNANCE TEST STATION**
Commanding Officer **CHINCOTEAGUE, VIRGINIA**
03

**Subj: SNOD MK 9 Mod 0 Mod 1 "Bat" Evaluation Test and Training
Program - Report of**

"CONFIDENTIAL"

9. The Commanding Officer desires to invite attention to the malfunctions and difficulties listed in paragraph 5 above and to recommend that positive corrective action be initiated. This attention is not invited in order to criticize the "Bat" but rather to emphasize the fact that such discrepancies are inherent in a complicated weapon of this type, even when it is maintained and operated by the most highly trained personnel available. It is an obvious fact that, if the guided missile is to be successfully used in quantity in the field, operating and maintenance personnel must be completely and thoroughly trained, and particular attention must be paid to simplicity and reliability in design and production.

W. V. R. VIEWEG

CC: BuAer
ComAirLant
OPAW 5
VP-104

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DECLASSIFIED
 Authority *NND 942597*
 By *bat* NARA Date *10/20/05*

"CONFIDENTIAL"

"Tabulation "BAT" Unit Flights" "CONFIDENTIAL"							
UNIT NO.	MOD.	DEC.	DISH ANGLE	DROPPING PLANE	DROPPING COURSE	RANGE (MILES)	SPEED ALTITUDE (ft.)
1245	1	1°58'	6°	PB4Y-2 (Port)	187°	3 1/2 Mi.	180K 5000
1150	0	2° 0'	3°30'	PB4Y-1 (Port)	185°	3 3/4 Mi.	180K 5000
1066	1	1°58'	6°	PB4Y-1 (Stbd)	145°	5 Mi.	180K 5000
698	0	1°55'	3°50'	PB4Y-2 59937	187°	4 Mi.	180K 5000
1198	1	1°58'	6°	PB4Y-2 59937 (Port)	187°	4 Mi.	180K 5000
1052	1	2°12'	6°	PB4Y-2 59919 (Port)	187°	4 Mi.	180K 5000
1002	0	2° 1'	3°30'	PB4Y-2 59937 (Stbd)	025°	4.25 Mi.	180K 5000
1250	1	1°52'	5°36'	PB4Y-2 59937 (Port)	000°		180K 3000
1101	0	2° 1'	3°40'	P4U-4 80779	030°	4 1/2 Mi.	185K 6700
1154	1	1°49'	6°0'	PB4Y-2 59919 (Port)	040°	4 Mi.	180K 5000
998	0	1°56'	3°24'	PB4Y-2 59919 (Stbd)	030°	3.9 Mi.	180K 5000
475	1	1°49'	5°27'	PB4Y-2 59937 (Stbd)	025°	4 Mi.	180K 5000
1175	0	2° 3'	3°55'	PB4Y-2 59937 (Port)	025°	4 Mi.	180K 5000
860	0	1°58'	3°30'	PB4Y-2 59937 (Stbd)	030°	No target	180K 5000
1104	0	2° 5'	3°30'	PB4Y-2 59919 (Port)	182°	4 Mi.	180K 5000
1155	0	2° 6'	3°44'	PB4Y-2 59937 (Port)	187°	4 Mi.	180K 5000
1268	1	2° 0'	6°5'	PB4Y-2 59919	200°	4 Mi.	179K 5000

Tabulation "BAT" Unit Flights

GROUND WIND (KNOTS)	BAT OPERATOR	DATE OF DROP	ESTIMATED IMPACT PT. AZIMUTH & HORIZONTAL	RANGE & VERTICAL	REMARKS
25K 020°	Wilhelm	9/25/46	75' Aft Bow	5' up. 25' over	
25K 020°	Hearn	9/25/46	50' Aft Bow	10' up 300' over	
25K 020°	Hearn	9/25/46	Ahead 20'	10' up 200' over	
12K 340°	Wilhelm	10/4/46	Aft 75'	On	
12K 340°	Kassenchuck	10/4/46	Uncon- trolled flight	Uncontrolled flight	Stuck Clutch
12K 340°	Leahey	10/4/46	Amidship direct hit	On	
30K 020°	Pflumer	10/14/46	Amidship	Waterline direct	
	Leahey	10/14/46	No Target	No Target	Demonstration Drop
8K 030°	McCrackin	10/15/46	Aft Bow 40'	6' above water line	
25K 030°	Glace	10/14/46	Pentail Direct	Direct 10' above water line	
28K 030°	Heying	10/14/46	Direct Amidship	Direct Amidship	
28K 030°	Wilhelm	10/15/46	Amidship	25' short	Salvo
28K 030°	Wilhelm	10/15/46	Amidship	Water line	Salvo
12K 040°	Donnelly	10/15/46	No Target	No Target	Demonstration Drop
5K 180°	Marcum	10/17/46	Stern 20' Forward	Direct Centered	
16K 180°	Hedges	10/17/46	20' Forward on Stern	Direct Centered	AVC from target 7 volts at time released.
5K 180°	Carver	10/17/46	Amidship	over high 5'	Dropped after gyro failed to uncage.

"CONFIDENTIAL"

Enclosure (B)

DECLASSIFIED
 Authority: A/N/D 942894
 By: JWH NARA Date: 10/20/05

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DECLASSIFIED
Authority NND 992597
By bat NARA Date 10/20/05

VP-HL 4/A9-B
Ser. No. 417

UNITED STATES ATLANTIC FLEET
AIR FORCE
HEAVY PATROL SQUADRON FOUR

"CONFIDENTIAL"

Naval Air Station
Atlantic City, N. J.
12 December 1946

"CONFIDENTIAL"

From: Commanding Officer, Heavy Patrol Squadron FOUR
To: Commanding Officer, NAOTS, Chincoteague, Virginia
Subject: SWOD MK-9 Mod. 0 and Mod. 1, Evaluation of
References: (a) NAOTS Conf. Ltr. 01 of 15 November 1946
Enclosures: (A) List of check out forms
(B) Operational data sheets

1. SWOD MK 9 Mod. 1 serial no. 996 was dropped on "USS Fleetwood" 9 December 1946. Bat checked out satisfactory on the ground and in the air. The flight was very stable and at approximately 100 feet the Bat banked into the target hitting the after superstructure with its left wing, and landed about 10 feet over the stern.

2. SWOD MK 9 Mod. 0 serial no. 1094 was dropped on "USS Fleetwood" 9 December 1946. Bat checked out satisfactorily on the ground, but the sensitivity check in flight was slightly lower than normal. Bat was locked on at 7 miles and released at 4 miles. The flight as a whole was considered unstable, but Bat appeared to track into the target landing 100 feet over and 25 feet to starboard. Possible cause - dropped too close to minimum range and weak sensitivity.

3. SWOD MK 9 Mod. 0 serial no. 1113 was dropped on "USS Fleetwood" 11 December 1946. Bat checked out satisfactorily on the ground and in the air. The flight was very stable and controversy arose among observers as to whether the Bat hit the superstructure or just missed it.

4. SWOD MK 9 Mod. 1 serial no. 260 was dropped on "USS Fleetwood" 11 December 1946. Bat checked out satisfactorily on the ground and in the air. Upon release the Bat nosed over into a steep glide, banking from right to left, but never attempting to flatten out glide, falling short of target approximately two miles. Possible cause - lost radar signal momentarily upon release, never regaining it.

5. It is noted by this command that the majority of the Bats overshoot the target, while very few undershoot. It is recommended the maximum dropping range be increased or that the dive position of the elevons be increased to attain faster dive motion as Bat approaches target.

/s/ R. B. BUCHAN

CC: ComAirLant
CFAW-5

R. B. BUCHAN

ENCLOSURE (C)

W-12 U.S. Naval Aviation Ordnance Test Station.

1947 Correspondence to the Co-member, Air Coordinating Committee, Airspace Subcommittee, dated 27 January, regarding Danger Area about Proposed Water Target in Chesapeake Bay, Request for. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

IN REPLY
REFER TO
ADDRESS
Commanding Officer
NASTS/41-25/741-10
(ON26/WRS:fmj)
U. S. NAVAL AVIATION ORDNANCE TEST STATION
Chincoteague, Virginia

NA III
Re 9
m

26

27 JAN 1947

From: Commanding Officer.
To: The Co-member, Air Coordinating Committee, Airspace
Subcommittee.
Via: Commander, Naval Air Bases, Fifth Naval District.
Subj: DANGER AREA ABOUT PROPOSED WATER TARGET IN CHESAPEAKE BAY,
REQUEST FOR.

Ref: (a) CO, NASTS ltr. NASTS/41-10 (ON26/WRS:fmj) serial 27 of
25 January 1947.

1. Reference (a) outlined the proposed target in the Chesapeake Bay
for guided missile tests. Briefly, this target will consist of a
liberty ship hull located about three miles southwest of Watts Island at

lat 37° - 45' - 24" N
long 75° - 55' - 36" W.

2. It is realized that this point is located on the proposed VHF
airways route from Norfolk, Virginia, to Salisbury, Maryland. How-
ever, in view of the strong sentiment expressed at the VHF airways
conference held in New York City on 9 January 1947 for re-routing
this airway inland, it is felt that the location of a danger area
at this point will be feasible.

3. Therefore, it is requested that action be taken to establish
an aircraft danger area consisting of a circle of five nautical
miles radius with its center at latitude 37° - 45' - 24" N, longitude
75° - 55' - 36" W.

W. V. R. VIEWEG

cc:
ComFive
BuOrd
ComAviant
ComServant

012947 0569

W-13 U.S. Naval Aviation Ordnance Test Station.

1947 Monthly Project Report, dated 27 January. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

DECLASSIFIED
 Authority: NPD 927631
 By: AD NaPA Date: 6/20

Hawai Aviation Ordnance Test Station

Monthly Status of Projects

as of the 15th of January 1947

Chinoeeseque, Virginia

CONFIDENTIAL

Project Number	Title	Plane Type and Bu. No.	BuOrd Directive Dated	BuOrd Completion Date	Project Status BuOrd Phase and % Completed	Estimated Completion Date	Remarks
G-4-46	SMOD MK 6 MOD 1 "Bart" Radar Counter Measure Tests	SNB-1 39778	4/46	-	-	Indefinite	Final report on Task assigned submitted 12/46 - Requested information regarding any future tests
G-5-46	SMOD MK 9 "Bart" Training of Fleet Squadrons	DBAY2 59937 FGP 94462 F4U 80779 SB2C 21095	9/46	-	D-100%	1/47	Report Submitted
A-9-46	60 Cal. Machine Gun, air firing	Not rec'd	Not rec'd	-	-	-	Awaiting directive, planes, guns and ammunition
A-9-46	Feed Mechanism T-22 for 20 MM	PGP 94462	6/46	-	C-95%	2/47	Acceleration tests being conducted - Fired 503 rounds
F-10-46	Bomb Director MK IV	TEM 86212	12/46	9/47	C-0%	9/47	Engineering services (Bell Lab. & Ford Instrument) to begin Jan. 20 in connection with installation of Bomb Director components in TEM aircraft.

*See Addenda Sheet for Explanation of Phases

REPRODUCED AT THE NATIONAL ARCHIVES

DECLASSIFIED
 Authority: NMD 927631
 By: AD/PA Date: 6/20

Naval Aviation Ordnance Test Station
 Monthly Status of Projects

as of the 15th of January 1947

Chincoteague, Virginia


"CONFIDENTIAL"

Project Number	Title	Plane Type and BuNo	BuOrd		Project Status and % Completed	Estimated Completion Date	Remarks
			Directive Dated	Completion Date			
3-11-46	Survey of Potential Targets for Heat-Homing Missiles (Flight Project Twelve)	Not rec'd	Not rec'd	Not rec'd	C-2%	1/49	Directive, planes, and survey equipment not received.
3-12-46	Vibration Tests of Soveo MK 18 installed in SMOD MK 9 "B.L.P"	PBAY-2 59937	10/46	11/46	C-100%	1/47	Report Submitted
3-14-46	Electric Bomb Hoist MK 47 adaptation for use with "B.L.P" on PBAY-2	PBAY-2 59937	None	-	D-100%	2/47	Project initiated by this Station. Report being written.
3-15-46	Automatic Reloader Rocket Launcher for 5" G.L.S.R.	Not rec'd	12/46	-	-	-	Awaiting launcher and rockets. M.G.O's Representatives will attend shop tests of prototype at Naval Gun Factory.

W-14 HQ Fifth Naval District, Norfolk 11 Virginia.

1947 Correspondence to the Comdt., U.S. Coast Guard, dated 11 February, regarding Establishment of a Prohibited and Restricted Area and Clearance for Installation of a Target Vessel (EX – SS John Carver) and 6 Dolphins in the Chesapeake Bay, Vicinity of Watts Island, VA, Request for Approval of. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

Address Reply to 
Refer to No.
ND5(32)/741-10

HEADQUARTERS FIFTH NAVAL DISTRICT
NORFOLK 11, VIRGINIA

11 FEB 1947

From: ComFive
To : Comdt., U.S. Coast Guard
Via : (1) U.S. District Engineers, Norfolk, Va.
(2) Comdr., 5th Coast Guard District

Subj: ESTABLISHMENT OF A PROHIBITED AND RESTRICTED AREA AND CLEARANCE
FOR INSTALLATION OF A TARGET VESSEL (EX-SS JOHN CARVER) AND 6
DOLPHINS IN THE CHESAPEAKE BAY, VICINITY OF WATTS ISLAND, VA. -
REQUEST FOR APPROVAL OF

Refs: (a) CNO Serial 2357P415 of 28 January 1946
(b) Section 15 of the Rivers and Harbors Act of 3 March 1899

Encls: 1. HW Copy of Naval Aviation Ordnance Test Station ltr NAOTS/
F41-10 (ON26/MRS:fmp) Serial 97 dtd 27 Jan 1947
2. HW Copy of Proposed Description and Regulations of subject
Prohibited and Restricted Area.
3. HW Photostatic copy of Section of USCGS Chart #1223, showing
limits of subject Prohibited and Restricted Area and location
of subject Target Vessel.

1. Reference (a) outlines the policy for establishment and/or disestablishment
of Anchorage and Restricted Areas. Ref (b) pertains to the voluntary sinking
of a vessel in the navigable waters of the United States.

2. As a result of proposals regarding the subject Prohibited and Restricted
Areas, Target Vessel and 6 Dolphins, presented by representatives of the
Bureau of Ordnance, Navy Department, and the Commanding Officer, Naval
Aviation Ordnance Test Station, Chincoteague, Va. in conference with representa-
tives of Naval Forces Afloat, ComFive, Comdr. 5th Coast Guard District, and U.S.
District Engineers on 4 Feb 1947, and in accordance with paragraph 4(b) and (c)
of Encl 1 and in view of the importance of the proposed use of the subject
Areas and Target Vessel in relation to the National Defence, approval for the
following is requested:

- A. Establishment of a Prohibited and Restricted Area with descriptions and
Regulations as defined in Encl 2 and shown on Encl 3 and publication in
accordance with paragraph 5 of ref (a).
- B. That the section of ref (b) relative to the voluntary sinking of a vessel
within the navigable waters of the United States, be waived and clearance
granted for the location of a Target Vessel (Ex-SS John Carver), in a position

021347 0140

REPRODUCED AT THE NATIONAL ARCHIVES

NAOTS/F41-10
(OR26/NRS:fmj)
Ser: 97

Subj: WATER TARGET FOR GUIDED MISSILES IN CHESAPEAKE BAY -
REQUEST FOR APPROVAL OF LOCATION OF

- (c) It is not in a channel.
 - (d) It requires a minimum of boating to service the target and boat facilities are available in the nearby town of Onancock, Virginia.
 - (e) It is a relatively sheltered location which will aid in maintaining the target and permit boarding for the purpose of conducting tests.
 - (f) It is at a reasonable distance from this station.
4. Therefore, it is requested that:
- (a) A conference of interested activities be scheduled at the earliest practicable date to discuss the location and use of the target in order that approval of the location may be expedited.
 - (b) Upon approval of the location, that action be taken for establishment of:
 - (1) A surface "prohibited" *area of 1,000 yards radius about the target location in order that unauthorized entry into target or rake stations may be controlled.
 - (2) A surface "restricted" *area of three miles radius about the target location to provide control of the area during tests as follows: "Target area - Watercraft shall, upon being warned, immediately vacate the area designated. Commercial vessels may proceed on established steamer lanes."
- * (These areas are similar to those presently outlined on USC & GS chart No. 1224 for Bloodsworth Island).
- (c) Upon approval of the location and after the target vessel has been equipped with certain special devices discussed in separate classified correspondence, that it be placed at the location approved.

REPRODUCED AT THE NATIONAL ARCHIVES

NAOTS/F41-10
(ON26/WRS:fap)
Ser: 97

Subj: WATER TARGET FOR GUIDED MISSILES IN CHESAPEAKE BAY -
REQUEST FOR APPROVAL OF LOCATION OF

5. By separate letter this date, (reference (a)), a request is being made to the Co-member, Air Coordinating Committee, Airspace Sub-committee, for the establishment of an aircraft danger area about the target location.

/s/ W.V.R. Vieweg

CC: ComServLent
ComAirLent
ComPhibsLent
ComFltTraGrpChes
ComNAB, 5ND, Attn: Co-member, Air Coordinating Committee, Airspace
Subcommittee
BuOrd

REPRODUCED AT THE NATIONAL ARCHIVES

PROPOSED DESCRIPTION OF AND REGULATIONS FOR REQUESTED PROHIBITED AND RESTRICTED AREA.

CHESAPEAKE BAY, VICINITY OF WATTS ISLAND, VA. -- PROHIBITED AND RESTRICTED AREA

A. THE AREAS:

- (1) **PROHIBITED AREA:** A circle 1,000 yards in radius from a point in Lat. 37-45-24 N ; Long. 75-55-36 W. Within this Prohibited Area will be a grounded and anchored Liberty Ship hull and around the circumference of the 1,000 yard circle will be located SIX (6) dolphins, each supporting a covered platform approximately SIX (6) feet square and elevated about FIFTEEN (15) feet above high water.
- (2) **RESTRICTED AREA:** A circle 3 miles in radius from a point in Lat. 37-45-24 N ; Long. 75-55-36 W, except that portion designated PROHIBITED AREA.

B. THE REGULATIONS:

- (1) Aircraft Bombing Operations on a surface target will be conducted intermittently within the area.
- (2) No vessel, craft or person except those authorized by the enforcing agency shall be permitted within the PROHIBITED AREA at any time.
- (3) Through navigation of the RESTRICTED AREA, will be permitted at all times but no vessel, craft or person except those authorized by the enforcing agency, will be permitted to loiter or remain within the RESTRICTED AREA when firing is or will soon be in progress.
- (4) Warning that firing is or will soon be in progress, will be indicated by a Red Flag displayed from one of the Six Dolphin Platforms, and by Patrol Vessels within the Area or by Aircraft employing the "BUZZING METHOD", which consists of low flight by an airplane, directly above and repeatedly opening and closing its throttle.
- (5) Vessels, craft or persons, upon observing the above warning signal and/or upon receiving a warning by any of the above methods, shall immediately proceed to leave the Restricted Area and remain clear of the Area until firing has ceased for the day.
- (6) Surface and/or Air search of the entire area shall be made prior to the commencement of firing on each scheduled day and during periods of firing a patrol vessel shall remain in the approach to the Restricted Area and maintain continuous contact with firing planes to warn when the range is not clear.

REPRODUCED AT THE NATIONAL ARCHIVES

PROPOSED DESCRIPTION OF AND REGULATIONS FOR REQUESTED PROHIBITED AND
RESTRICTED AREA: (continued)

B. THE REGULATIONS (continued)

- (7) All projectiles, bombs and rockets will be fired to land within the PROHIBITED AREA , but Naval Authorities will not be responsible for damage by such projectiles, bombs or rockets, or by Navy or Coast Guard vessels, to Nets, Traps, Buys, Pots, Fishpounds, Stakes or other equipment which may be located within the Restricted Area.
- (8) These regulations will be enforced by the Commanding Officer, Naval Aviation Ordnance Test Station, Chincoteague, Va., and the Captain of The Fort, Norfolk, Va., through such officers and enlisted men as may be designated by them, using all government vessels, planes and other equipment as may be necessary.

REPRODUCED AT THE NATIONAL ARCHIVES

ND5(32)/F41-10

11 FEB 1947

From: Comfive
To : Comdt., U.S. Coast Guard
Via : (1) U.S. District Engineers, Norfolk, Va.
(2) Comdr., 5th Coast Guard District
Subj: ESTABLISHMENT OF A PROHIBITED AND RESTRICTED AREA AND CLEARANCE FOR
INSTALLATION OF A TARGET VESSEL (EX-SS JOHN CARVER) AND 6 DOLPHINS
IN THE CHESAPEAKE BAY, VICINITY OF WATTS ISLAND, VA. - REQUEST FOR
APPROVAL OF

within the proposed Prohibited Area as shown on Encl 3 and the 6 Dolphins as described in paragraph 2(b) of Encl 1, the exact position of which to be determined after location of the Target Vessel. The subject Target Vessel to be grounded on the shoal on an even keel and anchored bow and stern to prevent shifting as a result of excessive wind and tide.

- G. That the Comdr., 5th Coast Guard District install in the vicinity of the Target Vessel such markings and warning devices as are required for the protection of navigation.

W. S. MACAULAY
Acting Commandant, 5ND

CC: (w/e)
CNO
BuOrd ✓
NAOTS, Chincoteague, Va.
ComAirLant

11 FEB 15 1947

11 FEB 15 1947

RECEIVED
2008

W-15 Navy Department, Washington 25, DC.

1947 Correspondence to the Chief of the Bureau of Supplies and Accounts, dated 12 February, regarding U.S. v. 5352 Acres of Land, more or less, for the Establishment of a Machine Gun and Rocket Range, in Connection with the Target Practice Program, for use by the Naval Aviation Test Station, Chincoteague, Virginia – Civil (not assigned). Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

ADDRESS REPLY TO
THE BUREAU OF YARDS AND DOCKS
AND REFER TO

NAVY DEPARTMENT
WASHINGTON 25, D. C.



NDS/N1-13
C48-49-Ch-3
F-5-1B

12 FEB 1947

To: Chief of the Bureau of Supplies and Accounts.
Subj: U.S. v. 5352 acres of land, more or less, for the establishment of a Machine Gun and Rocket Range, in connection with the target practice program, for use by the Naval Aviation Test Station, Chincoteague, Virginia - Civil (Not assigned).
Ref: (a) Ltr. N111(EaS) from BuOrd to BuDocks, dated 26, September 1946.

NA III
Es
jm

1. The Secretary of the Navy is requesting the Attorney General to condemn a leasehold interest in subject property for a term beginning at the time of the filing of the Declaration of Taking and ending June 30, 1947. The sum of \$2,420.00 has been determined to be the fair rental value of the property for the above period of time.
2. It is requested that a check be drawn to the order of the Clerk of the United States District Court for the Eastern District of Virginia in the sum of \$2,420.00 and that said check be delivered to this Bureau for transmission with the Declaration of Taking.
3. The sum of \$2,420.00 is being charged to appropriation "1770702 - Ordnance and Ordnance Stores, Navy, 1947," and to BuOrd. Reqn. No. ENG/5187-47; Expenditure Account 99309, Object Classification 051.

021347 0368

William M. Simmons
By direction of Chief of Bureau

Encl.
1. Public Voucher

CC: BuOrd. ✓

w-15

W-16 Navy Department, Washington 25 DC.

1947 Correspondence to the Chief of the Bureau of Supplies and Accounts, dated 12 February, regarding Claim of Richard B. Hall in the sum of #350 for the Appraisal of the Rental Value of 6,332 Acres of Land, more or less, for the Establishment of a Machine Gun and Rocket Range, in Connection with the Target Practice Program, for use by the Naval Aviation Test Station, Chincoteague, Virginia. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

ADDRESS REPLY TO
THE BUREAU OF YARDS AND DOCKS
AND REFER TO

NAVY DEPARTMENT

WASHINGTON 25, D. C.



ND5/W1-13
C48-49-Ch-3
F-5-1B

NAIII
Es
12 FEB 1947

To: Chief of the Bureau of Supplies and Accounts.

Subj: Claim of Richard B. Hall in the sum of \$350.00 for the appraisal of the rental value of 6,332 acres of land, more or less, for the establishment of a Machine Gun and Rocket Range in connection with the target practice program, for use by the Naval Aviation Test Station, Chincoteague, Va.

Ref: (a) Appraisal agreement NOy(R)-40,439 with Richard B. Hall in the sum of \$350.00 dated 16 November 1946.
(b) Ltr NAIII(ES3) from BuOrd to BuDocks, dated 26 September 1946.

1. The appraisal report covering subject property has been received in due form. It is recommended, therefore, that a check be drawn to the order of Richard B. Hall, 1427 Eye Street, N.W., Washington, D.C., in the sum of \$350.00 in settlement of his invoice dated January 28, 1947 for subject services as authorized by reference (a) appraisal agreement.

2. It is requested that this expenditure be charged against appropriation 1770702, "Ordnance and Ordnance Stores, Navy, 1947" and to BuOrd. Reqn. No. ENG/5157-47. Expenditure Account 99903, Object Classification 079.

Encl.

1. Invoice in duplicate in the sum of \$350.00

Willicm M. Simmons
By direction of Chief of Bureau

CC: BuOrd.
Mr. Richard B. Hall

021447 0088

w-16

W-17 Acting Secretary of the Navy.

1947 Correspondence to the Attorney General, dated 28 February, regarding Declaration of Taking of 5352 acres of land. Record Group 74; Entry 1002C; Box 195; Folder NA111; National Archives, College Park, MD.

IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE EASTERN DISTRICT OF VIRGINIA

United States of America,
Petitioner

v.

CIVIL NO. _____

5352 acres of land, more or
less, in Accomack County,
Commonwealth of Virginia,
J. M. Justice, et al.,

Defendants

DECLARATION OF TAKING

WHEREAS, pursuant to the acts of Congress approved July 8, 1946 (Public Law 492, 79th Congress), and August 1, 1888 (25 Stat. 357; U.S.C. title 40, Sec. 257), the above styled condemnation proceeding has been instituted.

NOW, THEREFORE, pursuant to the provisions of the Act of Congress approved February 26, 1931 (46 Stat. 1421), I, Secretary of the Navy, do hereby make and cause to be filed this declaration of taking, and by virtue of authority thereof do hereby state that the lands selected for acquisition aggregate 5352 acres, more or less, in Accomack County, Commonwealth of Virginia, more particularly described in Exhibit "A" attached hereto and made a part hereof, and delineated on a map

entitled "Chincoteague N.A.A.S. Accomack County, Virginia,
Additional Lands to be Acquired," attached hereto as Exhibit
"B" and made a part hereof.

And I do declare said lands to be taken under the
authority of the aforesaid Acts of Congress; that the use to
which said lands are to be put is for the establishment of a
Machine Gun and Rocket Range, in connection with the target
practice program, for use by the Naval Aviation Test Station,
Chincoteague, Virginia, as authorized by said acts; and that
the estate hereby taken in said lands for the public use
aforesaid is a term for years ending June 30, 1947.

And I do hereby state that the sum of money estimated
by me to be just compensation is Two Thousand Four Hundred and
Twenty Dollars (\$2,420.00), on the per annum basis, and
according to the allocation set forth in Schedule "A" hereof.

I am of the opinion that the ultimate award for the
taking of said lands will be within the limits prescribed by
Congress.

IN WITNESS WHEREOF, the petitioner, by and through the
Secretary of the Navy, has caused this declaration of taking
to be signed on the 7th day of February, 1947, in the City of
Washington, District of Columbia.

UNITED STATES OF AMERICA

W. John Kenney
Acting Secretary of the Navy

By _____

REPRODUCED AT THE NATIONAL ARCHIVES

SCHEDULE "A"

The names and addresses of the persons having title to or other interests in the lands described in the within declaration of taking, and the amounts estimated to be fair compensation for each respective ownership, including all improvements thereon, are as follows:

Name and Address	Parcel No.	Acres	Estimated Just Compensation
J. M. Justice Chincoteague, Va.	1	132	\$ 320.00 (Based upon \$785 per annum)
Commonwealth of Virginia	2	3180	\$ 350.00 (Based upon \$850 per annum)
Wallop's Island Club, Inc.	3	2040	1,750.00 (Based upon \$4000 per annum)

th

map

~~5322~~ ACRES, MORE OR LESS, OF LAND
LOCATED IN ACCOMACK COUNTY, VIRGINIA

All that land lying and being situate in the County of Accomack, Commonwealth of Virginia, more particularly described as follows:

Parcel 1

J.M. Justice

Beginning at an iron pipe at the northwesterly end of the N. 73° 25' W., 33.56 chain course in the boundary of the Naval Auxiliary Air Station, Chincoteague, Virginia, as described in Civil Action No. 6783, filed in the District Court of the United States for the Eastern District of Virginia, Northern Division; thence due South, through lands of J. M. Justice, 97 chains more or less to the centerline of Big Simon Easton Creek as said creek is designated and shown on the Chincoteague West Quadrangle of the Corps of Engineers, U.S. Army; thence in a general northeasterly direction with the centerline of said Simon Easton Creek, to an intersection with the low water mark on the westerly shore of Simon Easton Bay; thence northerly along the said low water mark on the west shore of Simon Easton Bay and along the west bank of Ginnias Gut to the southerly boundary of the lands of the Chincoteague Naval Auxiliary Air Station as described in the aforesaid Civil Action; thence N. 73° 25' W. binding on said lands of the Naval Auxiliary Air Station, 33.56 chains to the point of beginning; containing 132 acres, more or less.

Parcel 2

Commonwealth of Virginia

For point of reference commence at an iron pipe at the northwesterly end of the N. 73° 25' W., 33.56 chain course in the boundary of the Naval Auxiliary Air Station, Chincoteague, Virginia, as described in Civil Action No. 6783, filed in the District Court of the United States for the Eastern District of Virginia, Northern Division; thence due South, 97 chains, more or less, to the centerline of Big Simon Easton Creek as said creek is designated and shown on the Chincoteague West Quadrangle of the Corps of Engineers, U. S. Army, said point being the true point of beginning of this description; thence from said point of beginning, continuing due South, 168 chains, more or less, to the low water mark on the northerly shore of Ballast Narrows; thence southeasterly, crossing Ballast Narrows to a point on the low water mark on the northwesterly shore of Wallops Island, said point being at the intersection of the southeasterly shore of Ballast Narrows with the easterly shore of Island, Hole Narrows; thence northeasterly along the low water mark on the northwesterly shore of Wallops Island, to the most northerly point of said island; thence northwesterly, crossing the mouth of Ballast Narrows to the low water mark at the most southerly point of Walker Marsh; thence northeasterly and northerly along the low water mark on the easterly shore of Walker Marsh to the southerly shore of the entrance of Kendall Narrows; thence due East crossing the mouth of Kendall Narrows and Cockle Creek, to the low water mark on the southeasterly shore of Shell Bay Marsh; thence southeasterly, easterly and northeasterly along the low water mark on the southerly shore of Shell Bay Marsh and Willi Marsh to a point in said low water mark which bears S. 3

from the mouth of a small Creek at the most southerly end of Shell Bay; thence N. 30° W., to the mouth of said small creek at the most southerly end of Shell Bay; thence in a general northwesterly direction along the low water mark on the westerly shore of Shell Bay to the low water mark on the southerly shore of Cockle Creek; thence westerly along the low water mark on the southerly shore of Cockle Creek to the most northwesterly point of Shell Bay Marsh; thence northwesterly, crossing Cockle Creek to a point on the westerly shore of Mosquito Creek at the junction of said creek with Cockle Creek; thence northwesterly and westerly along the low water mark on the southerly shore of Mosquito Creek to the west bank of Ginnias Gut on the boundary of the Naval Auxiliary Air Station as described in said Civil Action No. 6783; thence southerly and southwesterly with the westerly bank of Ginnias Gut, and the westerly bank of Simon Easton Bay to the centerline of the mouth of Big Simon Easton Creek as designated on the aforementioned Chincoteague West Quadrangle; thence southwesterly with the centerline of said Creek, to the point of beginning; containing 3180 acres, more or less.

Parcel 3

Wallops Island Club, Inc.

All of that island known as Wallops Island, more particularly described as follows:

For point of reference commence at an iron pipe at the northwesterly end of the N. 73° 25' W., 33.56 chain course in the southerly boundary of the Naval Auxiliary Air Station, Chincoteague, Virginia, as described in Civil Action No. 6783 filed in the District Court of the United States for the Eastern District of Virginia, Northern Division; thence due South, 265 chains more or less to the low water mark on the northerly shore of Ballast Narrows; thence southeasterly, crossing Ballast Narrows to a point on the low water mark on the northwesterly shore of Wallops Island, said point being at the intersection of the southeasterly shore of Ballast Narrows with the easterly shore of Island Hole Narrows, the true point of beginning of this description; thence in a general southwesterly direction along the low water mark on the northwesterly shore of Wallops Island and along the southeasterly shores of Island Hole Narrows, and Bogues Bay, to an intersection with the 75° 28' 15" parallel of longitude; thence due south along the 75° 28' 15" parallel to an intersection with the low water mark of the southeasterly shore of Wallops Island; thence in a general northeasterly direction along the low water mark on the southeasterly shore of Wallops Island, bounded southeasterly by the Atlantic Ocean, to the mouth of Chincoteague Inlet; thence northwesterly with the low water mark of the southwesterly shore of Chincoteague Inlet to the southerly shore of Ballast Narrows; thence southwesterly with the low water mark of the southerly shore of Ballast Narrows to the point of beginning; containing 2040 acres, more or less.

Containing in all the above described parcels, 5352 acres, more or less, as delineated on that certain plat entitled "Chincoteague, N.A.A.S., Accomack County, Virginia, Additional Lands to be Acquired", revised November 21, 1946.

W-18 U.S. Naval Aviation Ordnance Test Station.

1947 Correspondence to the Chief of the Bureau of Ordnance, dated 12 December, regarding Comparative Test of T22 Feed Mechanism, Task Assignment NAOTS-18-Re8a-108-5, Interim Report of. Record Group 74; Entry 1002C; Box 197; Folder NA111; National Archives, College Park, MD.

IN REPLY
REFER TO NAOTS/A1-1(15)
Address (ON24/RER:vt) U. S. NAVAL AVIATION ORDNANCE TEST STATION
Commanding Officer CHINCOTEAGUE, VIRGINIA

1381

12 DEC 1947.

Na 111
741-1(20mm)
Re 8
u-4

R-E-S-T-R-I-C-T-E-D

From: The Commanding Officer
To: The Chief of the Bureau of Ordnance
Subj: Comparative Test of T22 Feed Mechanism, Task Assignment
NAOTS-18-Re8a-108-5, Interim Report of.
Refs: (a) BuOrd ltr. NA111 (Re8a)-JJS:hmg, dated 22 September 1947.
(b) Final Report on Task No. NAOTS A-9-46, dated 21 February 1947.
(c) NPG Rest. ltr. F41-1 (20mm) (R71558), dated 30 September 1947.
Encl: (A) High speed movies of the firing of the T22 Feeder with no initial tension of the feeder spring.

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1. A comparative test of the T22 and M2 Feeders was initiated by reference (a), the M2 Feeder being used as the standard. Two (2) reconditioned 20mm, M2 (T-31) guns were put in identical order for firing. The T22 Feeder was mounted on gun serial number 8063, and the M2 Feeder was mounted on gun serial number 10661. The two (2) guns were set up on the firing range so that they were fired simultaneously by a single electric firing switch. As a result of previous tests of the T22 Feeder at this station, as covered by reference (b), and after a study had been made of the Naval Proving Ground report on the T22 Feeder, reference (c), it was decided to conduct the preliminary tests of the T22 Feeder with no initial tension on the feeder spring and position the initial round into the feeder mouth manually. It was considered that, if satisfactory operation would result with no initial tension on the feeder spring, information could be obtained which would assist in the design of a feeder not incorporating the use of a spring with its associated disadvantages.

2. A verbal directive to suspend the test was received from the Bureau of Ordnance on 5 November 1947 after 1989 rounds had been fired with each feeder. The firing had been in bursts of twenty-five (25) and fifty (50) rounds with the exception of one one-hundred (100) round burst and one two-hundred (200) round burst. The operation of both feeders was satisfactory up to this time during which the T22 Feeder was being operated with no initial tension on the spring and the first round was positioned in the feeder mouth manually. The performance of the M2 Feeder was similar to that obtained previously; the feeding being both positive and reliable.

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NAOTS/AL-1(15)
(ON24/RER:vb)

R-E-S-T-R-I-C-T-E-D

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Subj: Comparative Test of T22 Feed Mechanism, Task Assignment
NAOTS-18-Re8a-108-4, Interim Report of.

3. The T22 Feeder was operated throughout this test with the initial round being positioned in the feeder mouth manually. The operation was, in general, satisfactory. A marked belt lurch was the out-standing undesirable feature of the feeder noticed during the test. A standard form-fitting ammunition chute was used to reduce this belt lurch so that the test could be continued. It is believed that the greater part or all of this belt lurch can be removed by the proper design of the front and rear feed wheels. High speed movies were taken of the feeder operation during firing in the initial tests. These high speed movies are included with this report as Enclosure (A). It is requested that these movies be returned to this station for filing upon completion of their study by interested parties.
4. After receiving the verbal directive to suspend the test, it was considered desirable to fire additional rounds in order to obtain high speed movies of the feeder operation. It was during this firing that the first malfunctions of the T22 Feeder were encountered during this test. These malfunctions were in the form of stoppages which occurred first after a ten-round burst. Finally, it was found that the feeder would not feed more than the first round. Firing was then attempted with the T22 Feeder fully wound, but there again stoppages occurred after one or two rounds had been fired. It was found that all spring tension was lost after two (2) rounds were fired. The cause of this malfunction is not known, but it may be due to the spring lip failing to engage with the slot in the drive shaft.
5. The cyclic rate of fire was obtained with each feeder at the start of the test and at the completion of firing of each five hundred (500) rounds. The rate of fire of the T22 Feeder (initial round positioned manually) was eight hundred and forty (840) rounds per minute. The rate of fire of the M2 Feeder (spring fully wound) was seven hundred and eighty (780) rounds per minute.
6. The belt pull of each feeder was taken at each five hundred (500) rounds. The inadequacy of the testing device used in making the belt pull tests was such that the actual belt pull obtained cannot be stated. However, the T22 Feeder operated satisfactorily feeding from a two hundred (200) round belt placed in an ammunition can about three (3) feet below the feeder. The T22 Feeder belt pull is less when the spring is initially unwound than when fully wound. However, with no initial spring tension on the T22 Feeder and with two (2) magazine slide anchors, the belt pull was

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(ON24/RER:vb)

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NAOTS-18-Re8a-108-4, Interim Report of.

great enough to part the ammunition belt. Conclusive belt pull tests were not conducted prior to suspension of this test. An adequate belt pull tester is at present under construction at this station, and when the test is resumed, accurate belt pull will be obtained.

7. During the test, the T22 Feeder functioned satisfactorily for about two thousand (2000) rounds during which the first round was positioned manually with no initial tension on the feeder spring. One burst of one hundred (100) rounds and one burst of two hundred (200) rounds were fired with no stoppages. The over travel beyond the amount required for positioning the incoming round is sufficient after the initial shot to build up enough energy in the spring for continued successful feeding.

8. It is recommended that when the T22 type feeder is manufactured for service use that it be provided with external power for positioning the initial round in the feeder mouth and that the ammunition belt lurch be corrected by redesigning front and rear feed wheels. The above changes will incorporate in the feeder two (2) features which will be desirable for cold weather operation. These two (2) desirable features are:

- (a) The gun could be readied for firing by positioning the initial round by external power thus eliminating the necessity for keeping the spring fully wound for great lengths of time, which is undesirable under extreme cold weather conditions.
- (b) The lack of tension in the feeder spring would give minimum friction on the top of the bolt and should insure an initial shot at any extreme temperature. Stripping the first round from a frozen full wound spring-loaded feeder has heretofore caused trouble during prolonged cold weather operation. The unwound feeder would also result in a higher cyclic rate due to absence of spring pressure forcing the incoming round against the top of the bolt. This pressure against the bolt in an M2 Feeder is estimated at ninety (90) pounds under normal conditions.

9. Upon completion of the modification or redesign of the T22 Feeder, it is recommended that the T22 Feeder be returned to the Naval Aviation Ordnance Test Station for further test under Task Assignment NAOTS-18-Re8a-108-5.

CC:
NGF, Washington, D. C.
NPG, Dahlgren, Va.

W. V. R. VIEWEG

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W-19 U.S. Naval Aviation Ordnance Test Station.

1948 Correspondence to the Chief of the Bureau of Yards and Docks, dated 30 April, regarding Annual Inspection of Public Works and Public Utilities, Submission of Record Group 74; Entry 1002C; Box 197; Folder NA111; National Archives, College Park, MD.

U. S. NAVAL AVIATION ORDNANCE TEST STATION
AND
U. S. NAVAL AUXILIARY AIR STATION
CHINCOTEAGUE, VIRGINIA

NL-9(2)/NAOTS/L5
(ON-9:WJG:bjj)

30 APR 1948

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To: Commanding Officer
Chief, Bureau of Yards and Docks

Annual Inspection of Public Works and Public Utilities;
submission of.

(a) Five ltr ND5(45)/(OP-4-5)/A9-1 of 4 October 1946.

(A) Annual Inspection Report of Public Works and Public
Utilities of NAAS and NAOTS, Chincoteague, Virginia.

1. In accordance with reference (a), the Annual Inspection Report of Public Works and Public Utilities of the Naval Auxiliary Air Station and the Naval Aviation Ordnance Test Station, Chincoteague, Virginia is forwarded herewith.

W. V. R. Vieweg
W. V. R. VIEWEG

CC: ComFive

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SUMMARY OF ESTIMATES ACCOMPANYING ANNUAL INSPECTION 1948 OF PUBLIC WORKS
 AND PUBLIC UTILITIES AT THE NAVAL AUXILIARY AIR STATION AND THE
 NAVAL AVIATION ORDONANCE TEST STATION, CHINCOTEAGUE, VIRGINIA

	Urgency periods			Totals
	Immediate	3 months	6 months	
Quarters	-	-	-	-
Buildings			\$42,500	\$40,175
Magazines			32,700	32,700
Streets and Sidewalks			6,000	6,000
Highways and Pavements				235,000
Highway Lighting System				Funds appropriated - being repaired by Station forces
Boundary Fence				Fence awaiting erection
Gasoline Storage Tanks				\$20,000 appropriated for expansion of system
Water Mains				Generally in good condition
Water Supply				\$85,900 approved for addition to water system
Sewage System				Alterations to the system are being made
Storm Drainage System				50,000
Central Heating Plant				Boiler feed water treatment in progress
Electrical System				Load tests to be made on arrival of proper instruments
Small Craft Facilities				190,000
Total			\$32,200	\$515,175
				\$357,375

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES
NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

QUARTERS:

All quarters are new and in good condition.

BUILDINGS:

Except as noted below all buildings are structurally and otherwise in good condition.

Building No. A-1 - Control Tower: General condition - good. Exterior brick walls show signs of spalling. Approximately 360 bricks have chipped out. Floors should be refinished and cracks filled. Weather stripping should be installed on all windows. Total estimated cost \$4,200.00 - 6 months.

Building No. A-3 - Field Lighting Control: General condition - good. Interior of building should be painted. Total estimated cost \$50.00 - 6 months.

Building No. A-4 - Public Works Office: General condition - good. All the minor discrepancies noted on inspection sheet have been corrected. Roof should be replaced. Total estimated cost \$350.00 - 6 months.

Building No. A-5 - Public Works Office: General condition - good. Roof has deteriorated to the extent that it now leaks. Total estimated cost \$350.00 - 6 months.

Building No. A-6 - Post Office, Store Room and Bowling Alleys: General condition - good. The exterior of the building should be painted. Total estimated cost - \$400.00 - 6 months.

Building No. A-8 - Civilian Barracks: General condition - good. The deck of the building should be refinished. Total estimated cost \$200.00 - 6 months.

Building No. A-10 - Head: General condition - good. Exterior of building should be painted. Total estimated cost \$250.00 - 6 months.

Building No. A-11 - Storehouse: General condition - good. Exterior of building needs repainting. Total estimated cost \$250.00 - 6 months.

Building No. A-19(T) - Storage S.D.P.#1: General condition - good. Building needs repainting. Total estimated cost \$100.00 - 6 months.

Building No. A-20 - Fire Equipment Storage: General condition - fair. Building needs foundation reinforced. Total estimated cost \$200.00 - 6 months.

Building No. A-26-A - Skeat House, L.H.: General condition - poor. Building should have walls replaced and roof repaired. Exterior of building requires painting. Total estimated cost \$50.00 - 6 months.

Building No. A-26-B - Range Storage: General condition - poor. Building is temporary structure. Roof needs repairing and new doors installed. Entire building should be repainted. Total estimated cost \$350.00 - 6 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

- Building No. A-27 - Machine Gun Bore Sight: General condition - poor. Building should be completely overhauled. Overhaul will include replacing decayed windows, doors, roof and the repainting of entire building. Total estimated cost \$450.00 - 6 months.
- Building No. B-5(T) - Hangar Storage, Public Works: General condition - good. Exterior of building should be painted. Total estimated cost \$850.00 - 6 months.
- Building No. B-6(T) - Electric Shop: General condition - good. Building should be painted and roof repaired. Total estimated cost \$450.00 - 6 months.
- Building No. B-10 - Water Storage Tank: General condition - good. Exterior of water storage tank needs painting. Total estimated cost - \$100.00 - 6 months.
- Building No. B-11 - Water Storage Tank: General condition - good. Exterior of water storage tank needs painting. Total estimated cost \$100.00 - 6 months.
- Building No. B-12 - Water Storage Tank: General condition - good. Exterior of water storage tank needs painting. Total estimated cost \$100.00 - 6 months.
- Building No. B-16-A - Lumber Storage VX-2: General condition - good. Exterior of building needs painting. Total estimated cost \$250.00 - 6 months.
- Building No. B-17(T) - Storage: General condition - fair. Exterior of building needs painting. Total estimated cost \$250.00 - 6 months.
- Building No. B-19(T) - Aviation Supply and Parachute Loft: General condition - fair. Exterior of building needs painting. Total estimated cost \$700.00 - 6 months.
- Building No. B-22(T) - Paint Shop, Storehouse: General condition - good. Exterior of building needs painting. Total estimated cost \$100.00 - 6 months.
- Building No. B-24(T) - Joiner Shop and Lumber Shed: General condition - fair. Exterior of building needs painting. Total estimated cost \$150.00 - 6 months.
- Building No. B-25 (T) - Transportation Pool Drivers' Shack: General condition - fair. Exterior of building needs painting. Total estimated cost \$50.00 - 6 months.
- Building No. B-26(T) - Paint Storage: General condition - fair. Exterior of building needs painting. Total estimated cost \$100.00 - 6 months.
- Building No. B-34(T) - Auto Body Shop: General condition - fair. Exterior of building needs painting. Total estimated cost \$100.00 - 6 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

Building No. B-35-A(T) - Radio Transmitter Shack: General condition - good. Exterior of building needs painting. Total estimated cost \$100.00 - 6 months.

Building No. B-38(T) - Commissary Store: General condition - good. Exterior of building needs painting. Total estimated cost \$250.00 - 6 months.

Building No. B-39(T) - Sentry House: General condition - poor. This building will require a general overhaul and painting. Total estimated cost \$100.00 - 6 months.

Building No. B-41(T) - Paint Storage: General condition - poor. Exterior of building needs painting. Total estimated cost \$100.00 - 6 months.

Building No. B-42(T) - Plumbing Shop: General condition - good. Exterior of building needs painting. Total estimated cost \$200.00 - 6 months.

Building No. B-46 - Quonset Storage: General condition - good. Exterior needs painting. Total estimated cost \$2,500.00 - 6 months.

Building No. B-49 - Water Pump House: General condition - good. Building needs painting and minor repairs. Total estimated cost \$50.00 - 6 months.

Building No. C-2(T) - Marine Barracks: General condition - good. Exterior of building needs painting and minor repairs. Total estimated cost \$300.00 - 6 months.

Building No. C-3(T) - Head E.M.: General condition - good. Roof will require minor repairs. Total estimated cost \$100.00 - 6 months.

Building No. C-4(T) - Barracks E.M.: General condition - good. Minor repairs on building are required in addition to exterior painting. Total estimated cost \$250.00 - 6 months.

Building No. C-6(T) - Barracks E.M.: General condition - good. Minor repairs are required on building in addition to painting. Total estimated cost \$250.00 - 6 months.

Building No. C-7(T) - Barracks E.M.: General condition - fair. The building needs minor repairs. Total estimated cost \$200.00 - 6 months.

Building No. C-8(T) - Head E.M.: General condition - fair. The building needs minor repairs. Total estimated cost \$200.00 - 6 months.

Building No. C-9(T) - Chiefs' Club: General condition - good. Exterior of building needs painting. Total estimated cost \$300.00 - 6 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

Building No. C-12, C-13, C-14 - E.M. Barracks: General condition - fair. Structural framing on these buildings have partially failed, due to improper spacing and inferior material. The end walls on two of the buildings have failed. Straps have been placed on the walls to hold them in place. The roof pitch on these buildings should be increased to prevent rain water from ponding on roof. The plumbing fixtures are in poor condition and should be replaced. Total estimated cost \$19,975 - 1 year.

Building No. D-1 - Fleet Hangar: General condition - good. The roof and skylights need minor repairs. The exterior trim and the exterior wooden doors need painting and minor repairs. The bricks that are spalling on this building have been reported on the Public Works Repair and Maintenance List. Total estimated cost \$2500.00 - 6 months.

Building No. D-2(T) Storage: General condition - poor. This building needs minor repairs. Total estimated cost \$100.00 - 6 months.

Building No. D-4 - Water Pumping Station: General condition - fair. The brick walls are spalling. Brick should be replaced. Total estimated cost \$400.00 - 6 months.

Building No. D-5(T) - Water Storage Tank: General condition - fair. This tank needs painting and caulking. Total estimated cost \$100.00 - 6 months.

Building No. D-6(T) - Water Storage Tank: General condition - fair. This tank is in need of caulking and painting. Total estimated cost \$100.00 - 6 months.

Building No. D-7(T) - Water Storage Tank: General condition - fair. This tank needs repairs, painting and caulking. Total estimated cost \$250.00 - 6 months.

Building No. D-8 - Boiler House: General condition - good. Exterior bricks are spalling. Exterior trim needs painting. Total estimated cost \$950.00 - 6 months.

Building No. D-9 - Laundry: General condition - good. The interior walls need stripping to prevent the wall board from sagging. Exterior trim should be painted. Total estimated cost \$5,050.00 - 6 months.

Building No. D-10 - Recreation Building: General condition - good. The concrete decks in the heads of this building should be resurfaced. The exterior trim should be painted to prevent further decay of trim material. The electrical system for the stage lights is in need of repairs. Total estimated cost \$5,500.00 - 6 months.

Building No. D-12 - Pump House For Sewage Disposal Plant #2: General condition - fair. The building has settled causing the exterior walls to crack. The exterior brick walls are spalling. Total estimated cost \$500.00 - 6 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

Building No. D-20(T) - Line Shack - General condition - poor. Building needs general repairs and painting. Total estimated cost \$250.00 - 6 months.

Building No. D-23(T) - Paint Shop - General condition - fair. This building needs general repairs and the exterior walls need painting. Total estimated cost \$300.00 - 6 months.

Building No. D-25(T) - Battery Shop - General condition - fair. This building needs general repairs and painting. Total estimated cost \$200.00 - 6 months.

Building No. D-26(T) - Water Storage Tank - General condition - fair. This tank needs general repairs and painting. Total estimated cost \$250.00 - 6 months.

Building No. D-28(T) - Carpentry Shop - General condition - fair. This building should be painted. Total estimated cost \$125.00 - 6 months.

Building No. D-29(T) - Fleet Air Detachment Ordnance Shack - General condition - poor. This building is in need of a general overhaul. The exterior of the building should be painted. Total estimated cost \$350.00 - 6 months.

Building No. D-30(T) - Drone Engineering Shack - General condition - poor. This building is in need of a general overhaul. The exterior of the building should be painted. Total estimated cost \$275.00 - 6 months.

Building No. D-34(T) - Tire Shop - General condition - poor. This building is in need of a general overhaul. The exterior of the building needs painting. Total estimated cost \$300.00 - 6 months.

Building No. D-35(T) - Storehouse - General condition - fair. This building needs painting. Total estimated cost \$50.00 - 6 months.

Building No. D-36(T) - Water Pump House - General condition - fair. This building needs painting. Total estimated cost \$50.00 - 6 months.

Building No. D-37-A(T) - Water Pump House - General condition - fair. This building needs painting. Total estimated cost \$50.00 - 6 months.

Building No. D-38(T) - Water Pump House - General condition - good. This building needs painting. Total estimated cost \$50.00 - 6 months.

Building No. D-39(T) - Water Pump House - General condition - fair. This building needs to be painted. Total estimated cost \$100.00 - 6 months.

Building No. D-40(T) - Water Pump House - General condition - poor. This building should be overhauled and painted. Total estimated cost \$200.00 - 6 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

Building No. E-2 - Mess Hall and Galley, Store & Restaurant, Recreation Storehouse and Miscellaneous: General condition - good. There are two flat areas on the roof of this building which are in very poor condition. The electrical wiring system in this building has become inadequate due to the installation of additional electrical galley equipment. Total estimated cost \$5,475.00 - 6 months.

Building No. E-3 - Jr. P.O.Q.:- General condition - good. Exterior doors need repair. Exterior trim on building needs painting. The floors are buckling due to insufficient nailing. Total estimated cost \$5,000.00 - 1 year.

Building No. E-4 - C.P.O. Quarters: General condition - good. The exterior trim on this building needs painting. Three new single doors should be installed. The floors are buckling due to insufficient nailing. Entire floor needs to be removed and relaid properly. Total estimated cost \$5,000.00 - 1 year.

Building No. E-6 - Garbage House: General condition - fair. This building needs painting. Total estimated cost \$100.00 - 6 months.

Building No. E-7 - Aviation Training and Education: General condition - good. Exterior trim of building needs painting. Total estimated cost \$250.00 - 6 months.

Building No. E-10(T) - Tool Storage Storehouse: General condition - fair. This building needs minor carpentry work and painting. Total estimated cost \$600.00 - 6 months.

Building No. E-14(T) - Storage: General condition - fair. This building needs repairs and painting. Total estimated cost \$1200.00 - 1 year.

Building No. E-16(T) - Garage Storage: General condition - poor. This building needs general repairs and painting. Total estimated cost \$800.00 - 1 year.

Building No. E-17(T) - Tool Storage: General condition - fair. This building needs general repairs and painting. Total estimated cost \$300.00 - 1 year.

Building No. E-18(T) - H.E. Repair: General condition - fair. This building needs painting. Total estimated cost \$200.00 - 6 months.

Building No. E-19(T) - Bulk Oil Storage: General condition - fair. This building needs minor repairs and painting. Total estimated cost \$250.00 - 6 months.

Building No. E-21(T) - Gasoline Receiving Station: General condition - fair. This building needs minor repairs and painting. Total estimated cost \$300.00 - 1 year.

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Building No. F-26A(T) - Saw Mill Shed: General condition - good. This building needs painting. Total estimated cost \$100.00 - 6 months.

Building No. F-28(T) - Battery Locker: General condition - fair. This building needs minor repairs and painting. Total estimated cost \$150.00 - 6 months.

Building No. J-1(T) - Machine Shop and Living Quarters: General condition - fair. This building is in need of minor repairs and painting. Total estimated cost \$400.00 - 6 months.

Building No. J-2(T) - Storage: General condition - poor. This building is in need of minor repairs and painting. Total estimated cost \$200.00 - 6 months.

Building No. J-3(T) - Bos'n Locker: General condition - fair. This building needs minor repairs and painting. Total estimated cost \$250.00 - 6 months.

Building No. J-6(T) - Paint Storage: General condition - poor. This building needs minor repairs. Total estimated cost \$200.00 - 6 months.

Building No. J-7(T) - Carpentry Shop: General condition - fair. This building needs minor repairs and painting. Total estimated cost \$200.00 - 6 months.

Building No. W-1 - Barracks: General condition - good. The exterior of this building needs painting. Total estimated cost \$300.00 - 6 months.

Building No. W-3(T) - Tool Storage: General condition - fair. The exterior of this building needs painting. Total estimated cost \$150.00 - 6 months.

Building No. W-4(T) - Garage: General condition - fair. This building needs minor repairs. Total estimated cost \$250.00 - 6 months.

Building No. W-10(T) - Storage: General condition - fair. This building needs minor repairs and painting. Total estimated cost \$300.00 - 6 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

MAGAZINES

Except as noted below all magazines are structurally and otherwise in good condition.

Magazine M-2(2XT1): The earth covering over the metallic roof has caused the roof to settle until it is impossible to operate the doors. To support the roof load additional timbers have been placed in the magazine. The wooden cribbing has deteriorated causing the earth filled bags to slump and erode. Total estimated cost \$1,450.00 - 6 months.

Magazine M-3(2Y02): The cribbing which retains the earth embankment has deteriorated, allowing the dirt to erode. Suggest recribbing and stabilization of the soil. Total estimated cost \$1,400.00 - 6 months.

Magazine M-4(2Y03): The wooden cribbing has deteriorated allowing the earth banking to erode. The metal roof has settled causing the doors to "drag". Total estimated cost \$1,500.00 - 6 months.

Magazine M-6(2X05): The ceiling has settled due to the excessive load. The wooden cribbing has deteriorated causing the earth banking to erode. Total estimated cost \$1,450.00 - 6 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

Magazine M-7(2XT6): Structural framing has partially failed causing doors to "drag". Temporary bracing has been installed. Wooden cribbing has deteriorated causing soil erosion of earth embankment. Total estimated cost \$1,450.00 - 6 months.

Magazine M-8(2XT7): Structural framing has partially failed causing doors to sag. Wooden cribbing has deteriorated causing soil erosion of earth embankment. Total estimated cost \$1,450.00 - 6 months.

HIGH EXPLOSIVES MAGAZINES:

Magazines M-9(3XT1), M-10(3XT2), M-11(3XT3), M-12(3XT4), M-13(3XT5), M-14(3XT6): Wooden cribbing has deteriorated causing the earth fill to erode. Suggest installation of concrete cribbing and replacing of earth fill. Total estimated cost \$24,000.00 - 6 months.

STREETS AND SIDEWALKS:

The streets and sidewalks on this station were built during emergency conditions. Due to lack of planning during the emergency years, some of the sidewalks and streets were built below the most desirable grades. The roads were built narrow (16' x 18' wide) which makes it impossible for heavy trucks to stay on the pavement when passing other vehicles or turning corners. The above mentioned conditions have resulted in cracked road slabs, which have deteriorated into pot holes. Some of the sidewalks require raising to prevent them from flooding during rainy weather. Total estimated cost \$6,000.00 - 6 months.

RUNWAYS AND TAXIWAYS:

The three runways and taxiways on this station have the following dimensions:

No. 10-28	-	Length - 6,000 ft.,	Width - 150 ft.	(Taxiway 75 ft. wide)
No. 16-34	-	" 4,800 ft.,	" 150 ft.	(" " " ")
No. 4-22	-	" 5,100 ft.,	" 150 ft.	(" " " ")

The above landing facilities were built during the emergency conditions, and have been used continuously since completion. Parts of the runways were erected on earth fill, which have settled causing the concrete slabs to crack. A contract has just been completed for the repair of 4,000 square yards of the 10-28 runway. A complete survey has been made on the runways and taxiways and it was found that all the runways and taxiways were in a very poor condition. Total estimated cost \$235,000.00 - 12 months.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

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RUNWAY LIGHTING SYSTEM:

A contract has just been completed for the rehabilitation of the runway lighting system. This contract renewed the main feeder lines from the control pannel to distribution lines. Sufficient funds are available for the renewing of the distribution lines. The work of renewing the distribution lines is under construction by Station forces.

BOUNDARY FENCE:

The boundary fence consists of a three strand barbed wire placed on cedar posts. The fence is inadequate in order to provide the proper security for the Station. The present fence is to be replaced with a cyclone fence.

GASOLINE STORAGE TANKS:

Funds in the amount of \$20,000 have been appropriated for the expansion of fuel storage tanks. The three prestressed concrete storage tanks probably need repairs for within the past 12 months one water well adjacent to the storage tanks was gasoline contaminated. Proceedings are under way for a thorough inspection of the gasoline storage tanks. On completion of the inspection, appropriate action will be taken to repair the subject tanks.

WATER MAINS:

The water mains are generally in good condition. The routine maintenance can be accomplished by Station forces.

WATER SUPPLY:

The water supply for this Station is procured by eight wells (50 - 65 feet deep) located on the Station. Funds have been appropriated for the drilling of 4 - 12" gravel packed wells and the installation of 1 - 100,000 overhead stand tanks. When the wells and tanks are installed the water supply and system on this Station will be in good condition.

SEWAGE SYSTEM:

The system is in good condition. Funds in the amount of \$5,100.00 have been appropriated for the installation of grease traps, sluice gates and metering devices. On completion of the above mentioned installation, the sewage flow can be properly proportioned between the two sewage plants, thus increasing the efficiency of the system. The above mentioned work is now in progress.

STORM DRAINAGE SYSTEM:

This Station does not have an adequate storm drainage system. After heavy rains, water ponds in low areas thereby creating pest control problems.

ANNUAL INSPECTION OF PUBLIC WORKS AND PUBLIC UTILITIES

NAAS & NAOTS, CHINCOTEAGUE, VIRGINIA

In other areas where the surface runoff is rapid serious erosion has taken place. It is recommended that additional storm drains be constructed to eliminate the above mentioned conditions. Total estimated cost \$50,000 - 1 year.

CENTRAL HEATING PLANT:

The central heating plant consists of four 165 H.P. coal fired boilers. The plant is in good condition with the exception of the boiler tubes, which have corroded due to unsatisfactory water condition. Water analysis have been made and corrective measures are now in progress. It is believed that the chemical treating of the boiler feed water will eliminate most of the corrosive nature of the water thus eliminating the extreme high maintenance cost on the heating plant.

ELECTRICAL DISTRIBUTION:

The system is in good condition. Due to the expansion of the Station there are some possibilities that unbalanced loads may exist in some areas. The proper equipment for making load tests in the various areas of the Station have been placed on order. As soon as the equipment arrives and the studies are made, the necessary corrective action will be taken. Some alterations to the system have been approved. The materials to make the changes are on order.

SMALL CRAFT FACILITIES:

The boathouse and docks for this Station are located on a small inlet on Queen Sound approximately three miles from the Station. The facilities are inadequate, for at low water only the smallest boats have access to Queen Sound. It is recommended that a channel be dredged to Navy property and that a permanent boat basin be provided for small craft. The above recommended improvements will be required to provide boating facilities to Wallop's Island and for Air Sea Rescue purposes. Total estimated cost \$190,000.00 - 12 months.

W-20 U.S. Naval Aviation Ordnance Test Station.

1947 Correspondence to the Chief of the Bureau of Ordnance, dated 14 June, regarding Test Range Instrumentation – Request for Project for Installation. Record Group 74; Entry 1002C; Box 197; Folder NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

IN REPLY

REFER TO NAO TS/N1-13

Address (ON26/WRS:epb)

Commanding Officer

U.S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA

62270

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NA III
14 JUN 1948

From: The Commanding Officer
To: The Chief of the Bureau of Ordnance
Subj: Test Range Instrumentation - Request for Project
for Installation.
Ref: (a) CO, NAO TS ltr. NAO TS/N1-13 (ON26/WRS:fmp),
Serial 179, dated 4 March 1948.

Encls: (A) Outline of Proposed System.
 (B) List of Equipment Required.

1. Reference (a) outlines plans for permanent fixed range installation and describes rake towers, theodolite towers, control building, power and communication lines, roads, etc., proposed for Wallops Island. This letter describes the instrumentation required to make the above facilities complete for test range purposes.

2. After considerable investigation and study, it has been decided to use an instrumentation similar to the one used at the Naval Ordnance Test Facility at Holly Ridge, North Carolina, employing a modified Mk 51 director as a photo-theodolite. This system was chosen for the following reasons:

- (a) The Mk 51 director is the only theodolite available that is capable of high tracking rates which will be necessary for the variety of tests to be conducted.
- (b) The Mk 51 stand is an excellent instrument to make accurate angular measurements of the position of a vehicle while that vehicle is tracked. It lends itself readily to conversion to a tracking stand because of its compactness, flexibility of movement, rugged and precise construction, and single operator control.

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NAOTS/N1-13
(ON26/WRS:ebh)

577

14 JUN 1948

Subj: Test Range Instrumentation - Request for Project
for Installation.

-
- (c) The timing and synchronization system allows measurement of time to an accuracy of .001 second and ensures that all pictures from all cameras are taken at the same instant.
 - (d) The method of film frame identification makes data reduction very accurate and much less tedious.

Enclosure (A) is a summary of the instrumentation as currently planned for Wallops Island.

3. To incorporate this system, the materials listed in Enclosure (B) will be required. The total cost of this material is estimated at \$81,000.

4. It is, therefore, requested that funds be set up in the amount of \$81,000 to procure and install the system as outlined. Since a large part of this equipment must be designed and built, it is further requested that provision be made for portions of this fund to be used to cover contracts to manufacturers for fabrication of units from drawings and prototypes provided by this Station.

W. V. R. Vieweg
W. V. R. VIEWEG

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PROPOSED INSTRUMENTATION OF WALLOPS ISLAND TEST RANGE

The proposed range instrumentation at this Station will consist of the following:

A. General

- (1) Six (6) dual theodolite towers, each equipped with two (2) Mk 51, Mod 3 tracking stands.
- (2) Each stand to accommodate two (2) motor-driven, modified Mitchell Cameras. These cameras to be equipped with forty (40) inch f5 to f8 lenses.
- (3) The synchro output of the stand to drive dial pointers, which will be photographed by a modified continuous strip camera. The film to be exposed by Edgerton flash lamps.
- (4) The entire system will be tied together and synchronized, frame for frame, by a centrally located photoelectric timing pulse generator, which will provide timing pulses at .250 second intervals.
- (5) The timing pulse will be beat against a General Radio crystal controlled time standard.
- (6) A six (6) channel communications system will be used with each tower capable of channel selection. A master unit will be provided for the Control Officer, which will monitor all channels, can communicate with each channel individually, or with all channels simultaneously.
- (7) A master control system will be located in the top deck of the range control building which overlooks the entire firing area. The controls are concentrated in a control desk which provides the test conductor with all necessary controls and indicator lights. In addition, safety circuits are included which are operated by a Naval Safety Officer in the control room. A continuity checker will be provided in a bombproof shelter near the launching platform. It will contain the necessary equipment for testing the electrical continuity through all rockets, flares, ignitors, etc., attached to these circuits.

ENCLOSURE (A)

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PROPOSED INSTRUMENTATION OF WALLOPS ISLAND TEST RANGE (CONT'D)

- (8) A range control room will be located on top of the range control building. From this room, the Senior Range Officer will command the entire range and firing area. He will be supplied with radio communications, as well as being tied into the general communications system. He will also be provided with a switch to indicate to the Control Officer permission to fire, as well as a switch by which he can stop firing procedures at any time he deems necessary.

B. Details of the System

- (1) The theodolite towers are three-storied, concrete and cinder block construction. A thirty (30) foot tower was chosen because, at this height, the trackers will have clear visibility and be above most of the surface haze prevalent in this area. The theodolites are mounted in order to make them vibration free and to ensure maintenance of level to $\pm .10$ mils.
- (2) The Mk 51 stand was chosen because of its accuracy, flexibility, ruggedness, precision engineering, and single operator control. The Mk 51 stand uses four (4) No. 6 synchro generators geared to the movements of the stand in train and elevation, and electrically transmits its position to the remote data panel.
- (3) The angular positions of the stand are to be recorded from the data panel and the recording bench. The data panel is located on one (1) end of a special bench with a recording camera mounted on the other. A center bracket holds two (2) parabolic reflectors, each containing two (2) 4340 flash bulbs. These illuminate the data panel and expose the film for the shutterless recording camera.
- (4) The data panel will have eight (8) dials, a coarse train, fine train, coarse elevation, and fine elevation for each Mk 51. It will also

ENCLOSURE (A)

- 2 -

REPRODUCED AT THE NATIONAL ARCHIVES

PROPOSED INSTRUMENTATION OF WALLOPS ISLAND TEST RANGE (CONT'D)

- contain two (2) standard electric one (1) second sweep timers and an electric pulse counter. The dial pointers are driven by No. 5F synchro motors. The electric timers, which are activated by the timing pulse, will record time of flight. The electric counter records the first and all subsequent .250 second pulses.
- (5) The recording camera will be a modified 35mm shutterless camera. The film will be exposed by the stroboscopic flashing of the 4340 tubes mounted in the parabolic reflectors and activated by the .250 second timing pulse. The duration of the flash is approximately 0.1 millisecond and stops all motion of film or pointer.
 - (6) The tracking telescope proposed is a modified Navy Mk 79 with objectives from the Army M-17 to obtain greater power. A special reticle is to be installed to indicate to the tracker his photographic field of view. The magnification of this system is 6.65 and the angular field is 5.6° .
 - (7) The cameras mounted on the Mk 51 stand will have two (2) functions; i.e., one (1) to obtain attitude, and the other, position information.
 - (8) The attitude camera will be a 35mm Mitchell high speed variable frame rate camera, driven by a synchronous motor capable of taking pictures at twenty (20) frames/sec or at sixty (60) frames/sec. It will be equipped with a forty (40) inch f5 or f8 lens. The film will be marked for synchronization by the same time pulse which activates the lights which expose the data dial film. This marking will be accomplished by photographing an electric counter which will number the frames to correspond with the frame marking of every camera on the range. A special gearing arrangement to position the shutter after each run will be incorporated.

ENCLOSURE (A)

- 3 -

REPRODUCED AT THE NATIONAL ARCHIVES

PROPOSED INSTRUMENTATION OF WALLOPS ISLAND TEST RANGE (CONT'D)

- (9) The position camera will be a modified Mitchell 35mm camera powered with a synchronous motor and operating at a frame rate of four (4) per second. The slow frame rate will necessitate the design and use of a dual shutter in order that the exposure time can be held at the desired level. Since this camera is to be used to obtain position in space, time velocity curves, and acceleration, it is imperative that the shutter be at maximum opening at the instant the data dial pictures are taken. To accomplish this, a #8 synchro generator is to be driven by the same shaft that operates the timing pulse generator, thus giving a positive direct mechanical link between the two. The output of this generator will activate a control transformer which is tied directly to the shutter shaft of the camera. If there is an angular difference between the position of the synchro generator and the control transformer, an electrical impulse is sent out by the control transformer. This impulse is amplified by a servo amplifier, located in the relay rack. The error voltage supplied by the servo amplifier is then used to turn a servo motor generator which positions the shutter through a system of differential gears.
- (10) This camera will also be provided with a film marking device and will be matched, frame for frame, with all data dial cameras and all other theodolite cameras.
- (11) The timing pulse generator will consist of an aluminum disc in which a lens will be mounted near the edge. This disc will be driven by a synchronous motor through a reduction gear box at four (4) revolutions per second. A light source (35mm kodalide projector) emitting a thin beam of light will be located on one (1) side of the disc while a photo electric cell will be located on the opposite side. As the lens passes through the beam of light, it focuses the light on the cell, thus activating it at the rate of four (4) times per second. The output of the tube is amplified and sent to each station.

ENCLOSURE (A)

- 4 -

REPRODUCED AT THE NATIONAL ARCHIVES

PROPOSED INSTRUMENTATION OF WALLOPS ISLAND TEST RANGE (CONT'D)

- (12) The pulses are received at each station by a pulse receiver and trigger unit. These pulses, after being amplified through two (2) stages of amplification, cause the grid of a thyratron tube to swing positive and fire. This discharges the 2mfd, 600V condensers in the plate circuit through ignitor coil primaries, thus firing the flash lamps.
- (13) The counter circuit is bridged off the pulse circuit at the output of the thyratron stage.
- (14) Since the synchronous motor used to drive the synchronous pulse generator depends upon line frequency for operation, a method for comparison of time intervals generated to a time standard will be employed. The time standard contemplated is the General Radio Primary Frequency Standard Class C-21-HLD. The accuracy of the output frequencies of this unit is better than ± 5 parts in 10 million over a period of several months.
- (15) The communications system is composed of three (3) type units. The standard unit contains one (1) listen amplifier and one (1) talk amplifier with a selector switch so that it may be used on one (1) of six (6) channels. It also includes provision for one (1) or two (2) auxiliary speakers and a remote unit. The remote unit has no amplifier self contained, but operates in conjunction with a standard unit. It can either be operated exclusively between itself and the unit to which it is connected, or on one (1) of the six (6) outside channels. The Master Control Unit contains two (2) amplifiers and has a switching arrangement so that the operator can either call on all channels or select a channel. Mixer circuits are used on the listening amplifier so that the Control Officer can hear all channels at all times.

ENCLOSURE (A)

- 5 -

REPRODUCED AT THE NATIONAL ARCHIVES

PROPOSED INSTRUMENTATION OF WALLOPS ISLAND TEST RANGE (CONT'D)

- (16) The Master Control System is to be incorporated in a console type desk located in the top deck of the range control building. The top of the control desk is to be the operations panel controlling the firing, the remote electrical synchronization of all stations, all communications channels, and the safety of the launching area.
- (17) The major functions of the control system are as follows:
- (a) To provide the Safety Officer at the control desk with the following indicator lights and controls:
 - (1) A switch to turn warning lights on and off and its indicator lights.
 - (2) Indicator light for Wiring Complete at ramp.
 - (3) Indicator light for Permission to Fire, granted by the Commanding Range Officer from the Control Range Tower.
 - (4) Push buttons to start and stop warning siren.
 - (5) A specially constructed removable plug as a means of disconnecting all firing and ignition circuits to the ramp.
 - (b) To provide the Range Officer with a means of stopping the firing procedure in any emergency.
 - (c) To provide a master communication unit. (Previously described).
 - (d) To provide all control switches and relays with indicator lights to show the respective position of their contacts.

ENCLOSURE (A)

- 6 -

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PROPOSED INSTRUMENTATION OF WALLOPS ISLAND TEST RANGE (CONT'D)

- (e) To provide an accurate one (1) second sweep electric timer.
 - (f) To provide indicator lights to show that pulse generator is working properly and that signals are going out on the line.
 - (g) To provide a check-operate circuit selection, so that station instrumentation can be checked out without sending power to the firing area.
- (18) The continuity checker located in the bombproof near the launching apron will contain twelve (12) push button stations to check wiring to twelve (12) outlets and to check continuity of rockets after hookup. Four (4) push button stations for each of the two (2) ignition circuits will also be provided to check the wiring to the launcher and to check the continuity of any attached squibs or flares.
- (19) All rockets, ignitors, or flares on each circuit will be fired in parallel. The power is supplied from transformers designed to withstand short circuits across the secondary for short periods of time.
- (20) The continuity checker is to be divided into three (3) separate compartments so that power from hot wires cannot contact any parts of a circuit that may accidentally fire a rocket or squib. Power for indicator lights is segregated in the center compartment and insulated from both sides.
- (21) The terminals for the primary side of the firing and ignition transformers are located on the opposite side of the transformer case from the secondary terminals. Power to the primary side can be cut by the safety plug, test operate switch, and firing switch at the control desk. The secondary circuit can be broken by the safety plugs on the continuity checker panel.

ENCLOSURE (A)

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ESTIMATED COST OF RANGE INSTRUMENTATION

	<u>Total Cost</u>
(1) Eight (8) local control units at \$400 each. This unit contains the switches controlling the time delay, counter, and remote switching circuits for the entire tower. In addition, it provides a regulated power supply and time delay relays.	\$3,200
(2) Intercommunication system (twenty (20) units with fifteen (15) remote microphone units with power supplies and two (2) master control units). System complete.	6,900 +
(3) Two (2) photoelectric timing pulse generators complete with power supplies and amplifiers at \$2000 each.	4,000
(4) Eight (8) pulse receiver and trigger units at \$300 each.	2,400
(5) Eight (8) rectifier units for D.C. Clutch operation at \$125 each.	1,000
(6) Eight (8) power supplies for Edgerton flash system at \$400.	3,200
(7) Twenty-eight (28) servo amplifiers for shutter synchronization at \$300 each.	8,400
(8) Modifications to twenty-four (24) High Speed Mitchell 35mm cameras including gear boxes, film marking adaptations, and synchronous motor drive at \$800 each.	19,200
(9) Modification of eight (8) 35mm data dial cameras to provide synchronous drive and shutterless operation at \$200 each.	1,600
(10) Data dials, benches, and reflectors, complete.	5,000
(11) Modification and rewiring of fourteen (14) Mk 51 gun directors at \$250 each.	3,500 ~
(12) Manufacture of Range Control desk and operation panel.	6,000

ENCLOSURE (B)

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ESTIMATED COST OF RANGE INSTRUMENTATION (CONT'D)

	<u>Total Cost</u>
(13) Manufacture of continuity and circuit checker.	\$ 600
(14) Fabrication of cable and connectors for entire system.	6,000
(15) Labor for installation and check-out.	<u>10,000</u>
Total	\$81,000

ENCLOSURE (B)

- 2 -

W-21 Ad Hoc Subcommittee on Range Planning, Committee on Guided Missiles, Research and Development Board.

1949 Report on Wallops Island Range Interference, dated 4 March. Record Group 74; Entry 1003A; Box 578; File NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

Authority NND 957741
By LB NARA Date 10-19-05

GM 31/20

CONFIDENTIAL

4 March 1949

AD HOC SUBCOMMITTEE ON RANGE PLANNING
COMMITTEE ON GUIDED MISSILES
RESEARCH AND DEVELOPMENT BOARD

REPORT ON WALLOPS ISLAND RANGE INTERFERENCE

INTRODUCTION

At its 15th meeting (Item 16), the Committee on Guided Missiles referred the problem of range interference at Wallops Island between the Navy and the NACA to this subcommittee for recommendations as to resolution; the recommendations to form a part of the recommended national program for guided missile test ranges.

STATEMENT OF THE PROBLEM

Wallops Island is an uninhabited (except for NACA range personnel) sandbar about 6 miles in length on the Atlantic Ocean a few miles south of the Maryland-Virginia line. It is owned by the Wallops Island Gun Club except for 30-100 acres owned by NACA on which are erected the NACA model launching facilities, a total investment of about \$4,000,000. The NACA leases additional 1000 acres while the Navy leases the balance of the island-about 3000 acres. The location is well suited to certain types of model and missile testing since uninhabitable swamps and shallow bays create a safety zone of about 3 miles between the island and the mainland while the shallow water of the Atlantic shelf keeps coastwise shipping 30-40 miles offshore and is suitable for missile recovery.

The NACA now occupies part of the southern portion of Wallops Island with all its firings being directed seaward, while the northern portion is used as an impact area for the NAOTS, Chincoteague.

The Navy proposes to install launching facilities on the north end of Wallops Island and to fire missiles in a southerly direction using observation stations located along the coast both north and south of the present NACA facilities. The line of fire for ground launched missiles would pass the NACA installation about $1\frac{1}{2}$ miles offshore while air launchings using the same instrumentation would pass 3 or 4 miles offshore. Both lines of fire cross the NACA field of fire.

The proposed action by the Navy raises the following problems:

1. Safety of Personnel and installations
2. Interference by boats and aircraft in the firing areas common to both ranges
3. Interference on radio and telemetering channels

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COMMITTEE ON RESEARCH
STANDARD

Authority NND 95 7741
By LB NARA Date 10-19-05

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FACTUAL DETERMINATIONS

As a result of presentations by representatives of the NACA and Navy and questions by the Ad Hoc Subcommittee, the following facts bearing on the case are enumerated:

NACA

1. The facility was established and first firings made in 1945
2. The present level of firings is 400 research models per year plus 2 practice rounds for each research model making a total of 1200 firings per year.
3. Present expenditures are between 1 and 2 million dollars per year.
4. The contemplated work load to conform with current directives is about 900 research models plus practice rounds.
5. Present maximum ranges are 15-20 miles which may be extended to 60-100 miles when self-propelled models are introduced.
6. Instrumentation includes telemetry with receivers in aircraft.
7. 73 people are permanently stationed at Wallops Island under the supervision of the NACA establishment at Langley Field 70 miles distant.
8. NACA's primary mission at Wallops Island is to obtain data for the solution of basic aerodynamics problems.
9. It would take 2 to 3 years and more than the present investment in Wallops Island for the NACA to relocate and build up operations to the present scale.

NAVY

1. The NAOTS and NAAS, Chincoteague form a permanent Naval facility about 5 miles north of Wallops Island.
2. This Naval activity is concerned in other types of work besides guided missile testing, e.g., rocket testing and drone operations.
3. The north end of Wallops Island is currently in use as a rocket impact area.

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Authority NND 95 7741
By LB NARA Date 10-19-00 4 March 1949

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4. The lack of facilities such as roads, docks, water supply, etc., reduces the utility of Wallops Island for present use, exclusive of guided missile testing.
5. The major portion of the \$1,617,200 requested for Wallops Island will be used for these types of facilities, a minor portion will be used for guided missile launching pads, et.
6. The Navy originally planned to purchase all of Wallops Island not now owned by NACA but have abandoned this plan.
7. The present Navy firing program calls for 8 ground launched missiles in the balance of FY 1949, 21 ground launched missiles in the FY 1950, 30 air launched missiles in the next 15 months.
8. This represents a considerable reduction from the figures originally quoted to NACA of 180 firings during the next year.
9. The Navy has indicated a willingness to conduct firings on weekends if necessary from a safety or interference standpoint.
10. Instrumentation in the form of an SCR-584 radar has already been installed on Wallops Island north of the NACA location at a cost of about \$200,000.
11. Recovery requirements for the Kingfisher Missile make a shallow water range mandatory.

GENERAL

- a. Only about one-half the days in the year are suitable for firing from a weather standpoint.

CONCLUSIONS

After consideration of the pertinent facts and with consideration given to requirements of the national guided missile program and the need for careful expenditure of facilities funds, the following conclusions were reached by the Ad Hoc Subcommittee:

1. *The Wallops Island area appears adequate to support both the NACA and the Navy programs as defined above.
2. The NACA has the primary interest in Wallops Island area.

*NACA Dissent

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Authority NND 957741
By LB NARA Date 10-19-05

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3. The NACA has the more extensive program in progress at Wallops Island in the point of time consumed and required.
4. The NACA has the more extensive investment in Wallops Island.
5. Funds expended for the proposed Navy facilities at Wallops Island as approved by the Guided Missile Committee would not be wasted in the event of a later move by the Navy of its guided missile test program to another test range since most of the facilities proposed will have continuing use in the testing of other Naval Ordnance equipment.

RECOMMENDATIONS

The Ad Hoc Subcommittee on Range Planning recommends that:

1. The NACA be considered to have interest paramount to the Navy's guided missile test activities in the Wallops Island area.
2. *A coordinating committee be set up by the Navy and NACA.
3. The Panel on Test Range Procedures and Instrumentation be requested to investigate the electronic interference and the possibilities of saturation on the basis of the firing programs as defined above.
4. The Committee on Guided Missiles approve the first increment for Wallops Island range facilities as recommended by the Panel on Facilities.
5. Upon completion of the Kingfisher test program, no further guided missile test programs be instituted by the Navy at Wallops Island.

*NACA dissent

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GM 31/20

W-22 United States Atlantic Fleet Air Force.

1947 Correspondence to the Chief of the Bureau of Ordnance, dated 22 September, regarding Aircraft Service and Training Munitions at East and Record Group 74; Entry 1003A; Box 578; File NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

Authority NM 917539
By R.T. NARA Date 10-18-05

AJA-253050

File No: **FF13-2/S78**

UNITED STATES ATLANTIC FLEET

Serial: **90**

0599

AIR FORCE

(ADMINISTRATIVE)
U. S. NAVAL AIR STATION
NORFOLK 11, VIRGINIA

CONFIDENTIAL

SEP 22 1947

C-O-N-F-I-D-E-N-T-I-A-L

From: Commander Air Force, Atlantic Fleet.
To: The Chief of the Bureau of Ordnance.
Via: (1) Commander in Chief, U. S. Atlantic Fleet.
(2) The Chief of Naval Operations.

Subject: Aircraft service and training munitions at East and Gulf Coast Naval Air Stations; pertinent data concerning.

Reference: ✓ (a) CNO ltr Op-411B3/ECD(SC) S78-1/NA27 Ser 0168P411 of 19 Aug 47. *NA27-NA3NA2*

Enclosures: ✓ (A) Recommended Aircraft Service Munitions Distribution, East and Gulf Coast Naval Air Stations.
✓ (B) Estimated Average Monthly Expenditures of Aircraft Training Munitions for Shore-based Training.

1. Reference (a) requested BuOrd to revise the aircraft service munitions allowances for various continental naval air stations. It was further requested that ComAirLant supply pertinent data for use in the preparation of the allowances, and to furnish monthly training requirements.

2. Enclosure (A) is the recommended distribution of service munitions at various continental naval air stations. Enclosure (B) is the estimated average monthly expenditures of aircraft training munitions by continental based AirLant units.

3. The service munitions level is that required for one load and one reload, of a proportional amount of each type of munition listed, for the normal fleet aircraft complement of each air station in performing its assigned mission. The rocket level is based on a 100% load and reload. Training expenditures are based upon the portions of applicable allowance lists set aside for shore-based training.

4. It is assumed that the munitions stock level for the East Coast Marine Corps Air Stations will be the subject of correspondence originated by the Commandant, U. S. Marine Corps.

Copy to:
ComFairQuonset
ComAirPac

E. C. Parker
E. C. PARKER
CHIEF OF STAFF

W-22

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Authority NA 91759
 By R. T. NARA Date 10-18-05

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C-O-N-F-I-D-E-N-T-I-A-L

RECOMMENDED SERVICE AIRCRAFT MUNITIONS DISTRIBUTION,
EAST AND GULF COAST NAVAL AIR STATIONS.

	<u>NAS Quonset</u> <u>(NAAS Charlestown)</u>	<u>NAS</u> <u>Atlantic</u> <u>City</u>	<u>NAS Norfolk</u> <u>(NAAS Oceana)</u>	<u>NAS</u> <u>Key West</u>	<u>NAAS</u> <u>Chincoteague</u>
1000# SAP Bomb	32	12	30	12	12
500# SAP Bomb	102	126	48	24	24
1000# GP Bomb	80	12	72	12	12
500# GP Bomb	392	318	498	96	32
250# GP Bomb	198	30	168	128	24
100# GP Bomb	180 <i>+ 96/m</i>	54 <i>+ 18/m</i>	432 <i>- 48/m</i>	36 <i>- 6/m</i>	36
350# ADB	364	218	720	72	144
11W75 HVAR	386	60	414	36	36
580 HVAR	3888	620 <i>- 106/m</i>	7092*	736	624*
Torpedo Warhead	76	23	126	18	0

* 624 ASW Type Heads.

	<u>NAS Lakehurst</u>	<u>NAF Weeksville</u>
350# ADB	32 <i>100/m</i>	32 <i>200/m</i>
782 Rocket	128	128

Quantities and types of fuzes and detonators shall be distributed to allow for arming against the various targets that may be encountered.

11747 0009

ENCLOSURE (A)
 ENCLOSURE (A)

REPRODUCED AT THE NATIONAL ARCHIVES

Authority NM 917539
 By R.T. NARA Date 10-18-06

CONFIDENTIAL

C-O-N-E-I-D-E-N-T-I-A-L

ESTIMATED AVERAGE MONTHLY EXPENDITURES OF AIRCRAFT TRAINING MUNITIONS FOR SHOT-BASED TRAINING.

	NAS Quonset Pt. (NAAS Charlestown)	NAS Atlantic City	NAS Norfolk (NAAS Oceana)	NAS Key West	NAAS Chincoteague	NAS Lakehurst	NAF Weeksvil
20 MM A/C	9400	9500	25800	5000	2000	525	525
.50 Cal A/C	69600	75300	75500	45000	5000	670	670
.30 Cal A/C	17500	--	25000	--	--	--	--
2825 SCAR	6000	1000	6500	1200	--	--	--
3825 AR (ASW Head)	--	--	650	--	--	--	--
570 HVAR	--	108	--	--	--	96	96
782 Rocket	--	--	--	--	--	--	--
100# GP Bomb	36	18	48	6	--	--	24
350# ADB	--	4	--	--	--	--	24

Distribute fuzes and detonators as available and allowed by OCL AVI-47.

ENCLOSURE (B)
 ENCLOSURE (B)

ENCLOSURE (B)

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Authority *NM 917559*
By *R. T. NARA* Date *10-18-05*



NAVY DEPARTMENT
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON 25, D. C.

Op-411B3/ECD
(SC) S78-1/NA43
Serial: 0226P411

12 NOV 1947

CONFIDENTIAL
~~C-O-N-F-I-D-E-N-T-I-A-L~~

Subject: Aircraft Service and Training Munitions at East and Gulf Coast
Naval Air Stations; pertinent data concerning.

In addition, the attention of the Commander Air Force, U. S. Atlantic Fleet, is invited to the fact that reference (d) does not require torpedo storage at the Naval Air Station, Atlantic City, and also that there is no longer a required torpedo storage level for the Key West area, since the aircraft torpedoes at the Naval Submarine Base, Key West, have been removed in accordance with reference (e).

5. Since no training allowance of 742 rockets is presently authorized for LTA groups, training expenditures indicated in Enclosure (B) may be subject to revision when such allowance is promulgated.

6. Munitions stock levels for Marine Corps Air Stations will be the subject of separate correspondence.

I. N. Kiland

I. N. KILAND
BY DIRECTION

Copy to:	(End. only)
BuAer	"
CinCLantFlt	"
ComAirLant	"
ComFairQuonset	"
ComAirPac	"
ComdtMarCorps	(Complete)

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REGISTERED MAIL
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REPRODUCED AT THE NATIONAL ARCHIVES

Authority NM 917559
By R.T. NARA Date 10-8-06

NAVY DEPARTMENT
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON 25, D. C.



Op-411B3/ECD
(SC) S78-1/NA43
Serial: 0226F411

CONFIDENTIAL
C-O-N-F-I-D-E-N-T-I-A-L

12 NOV 1947

SECOND ENDORSEMENT on
ComAirLant Conf. Ltr.
EF13-2/S78 Ser: 0599
dtd. 22 Sept. 1947.

From: Chief of Naval Operations
To : Chief of the Bureau of Ordnance

Subject: Aircraft Service and Training Munitions at East and Gulf Coast
Naval Air Stations; pertinent data concerning.

Reference: (b) BuOrd ltr. L5(1n)-AJC:alb of 6 Oct. 1947 to BuAer (cc: CNO
and NavGen only).
(c) BuAer ltr. Aer-SE Ser: 80421 of 15 Oct. 1947 to BuOrd.
(d) BuOrd conf. ltr. S75-1(Mn3b)MEF/eins of 12 Aug. 1947 to
Multiple Addressees.
(e) CinCLant Conf. ltr. S75-1/(0703) of 13 Oct. 1947 to BuOrd.

1. Forwarded, concurring in the recommendations of the basic letter, subject to the following comments.
2. Stations concerned must be able to stow the desired quantities of munitions without exceeding quantity-distance requirements as stated in O.P. 5.
3. Reference (b) proposed inspections of explosives stowages at air stations, which was concurred in by reference (c). The munitions levels for those air stations listed in Enclosure (A) may be subject to revision should the Inspector of Naval Ordnance Establishments not concur in all safety aspects of the explosive stowages at the stations concerned. It is requested that this office be furnished an information copy of such inspection reports submitted by the Inspector of Naval Ordnance Establishments as concern the stations noted in Enclosure (A).
4. Although it is not mandatory that warheads for all torpedoes at air stations be stowed within the limits of the station; nevertheless they should be stowed at such a location as to be readily available in event of emergency, and the location selected must be acceptable to the Bureau of Ordnance. Therefore, by copy of this endorsement, the Commander Air Force, U. S. Atlantic Fleet, is requested to conclude stowage arrangements for torpedo warheads which are required at the Naval Air Station, Quonset Point, and Naval Air Station, Norfolk, to meet the torpedo levels set by reference (d) but which are not fully provided for in Enclosure (A) of the basic letter, as indicated below:

Torpedoes Required by reference (d)	Warheads Planned in Enclosure (A)	Difference
NAS, Quonset Pt. 265	76	189
NAS, Norfolk 200	126	74

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W-23 The Chief of the Bureau of Ordnance.

1943 Correspondence to the Chief of the Bureau of Yards and Docks, dated 22 December, regarding Rocket Range, Chincoteague, VA – Land for Facilities. Record Group 74, Entry 25, Box 258, Folder N1-13, National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

A
B
C (Ad3b)
Ad From:
Ad3 To:
Subj:
Encl: (HW)
Re
Fi
Mn
Pr

1 71-13

22 DEC 1943

The Chief of the Bureau of Ordnance
The Chief of the Bureau of Yards and Docks

Rocket Range, Chincoteague, Va. - Land for Facilities

(A) Sketch of Chincoteague Air Field showing Proposed Land Acquisitions

1. It is requested that the Bureau of Yards and Docks furnish this Bureau with a flash appraisal of the following described property for use in connection with the planning of the subject activity.

Beginning at corner number 3 on the south boundary of Chincoteague Field, said corner being located at the northwesterly end of the N. 73° 25' W., 33.56 chain course of the present station boundary; thence, from said point of beginning extending south 2 1/2 miles more or less to an intersection with the north shore line of a slough running westerly from Chincoteague Channel; thence, following said shore line, southeasterly, northeasterly, and northwesterly to a point in the entrance to Shell Bay; thence, northeasterly, crossing Shell Bay to the southerly tip of a point forming the northerly side of said entrance; thence, northwesterly along the shore line of said point of land to an intersection with the south right-of-way line of State Road 175; thence, westerly along said road 175 to the easterly boundary of the present air station on Ginnias Creek; thence, southwesterly and westerly along said station boundary to the point of beginning. Said area being delineated on that certain plot entitled "Sketch of Chincoteague Field, showing proposed acquisitions" dated 12/16/43.

2. The above described property includes areas "A", "B", "C", and "D", as indicated on enclosure (A). Area "C" includes that portion between areas "A" and "D" which is of the same color as areas "C" and "B". It is also requested that an appraisal be given on the separate sections of the entire area as follows:

- (a) Area "A" (colored green)
- (b) Area "B" (colored orange) and to the north of area "A"
- (c) Areas "A" and "B" as one unit

3. No commitments for the purchase of the land should be made at this time.

me

CC: Re
PLc

G. F. HUSKEY, JR.

Prepared 12/20/43 J. C. Hynes, Jr.
By Direction

GPO 16-20171

W-23

W-24 U.S. Naval Aviation Ordnance Test Station.

1948 Correspondence to the Chief of the Bureau of Ordnance, dated 12 October, regarding Air Danger Areas and Airspace Warning Areas for use by U.S. Naval Aviation Ordnance Test Station, Chincoteague, VA, Status of. Record Group 74; Entry 1001; Box 98; File NA111; National Archives, College Park, MD.

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15/ML-13
to (ON26/WRS:jh)
Address
Commanding Officer

**U. S. NAVAL AVIATION ORDNANCE TEST STATION
CHINCOTEAGUE, VIRGINIA**

12 OCT 1949

1005

mail
Ple

From: Commanding Officer
To: Chief of the Bureau of Ordnance

Subj: Air Danger Areas and Airspace Warning Areas for use by U.S.
Naval Aviation Ordnance Test Station, Chincoteague, Va.,
Status of.

Ref: (a) Washington ASSC Meetings Nos. 65, 77, 114, 130, and 138.

Encls: (A) History of Danger and Warning Areas.
(B) Chart of Areas.

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1. In early 1947 this Station took steps to acquire control of the needed airspace to conduct the business of the Station. By agreement with the Fleet and the Air Force, these areas were established by the summer of 1947.

2. Since that time, as a result of reference (a), the status of danger and warning areas in general has changed considerably, and in the process, the identity of the original areas has been lost. A chronological history of these events is given in Enclosure (A), and shown on the charts in Enclosure (B).

3. The results of these changes have been to:

- (a) Include the Tangier Island danger area over the ship target "Bullseye" as a portion of the Patuxent Danger area. This was done without knowledge of this Command until attention was directed to the fact by recently published charts.
- (b) Eliminate the area in vicinity of Wallops Island as a separate entity, though it had been established on two (2) previous occasions. This, in effect, opened the way to loss of the area by lack of appreciation on the part of other commands of what is involved.
- (c) Establish an area for the Air Force that severely limits operations around Wallops Island in spite of the slight easement obtained just prior to placing the area in effect.

REPRODUCED AT THE NATIONAL ARCHIVES

1005

12 OCT 1949

Subj: Air Danger Areas and Airspace Warning Areas for use by U.S.
Naval Aviation Ordnance Test Station, Chincoteague, Va.,
Status of.

4. As has been expressed in the requests for areas made by this Command, this Station requires three (3) areas for its operations; the first is sufficient space in the vicinity of Wallops Island to permit freedom of tests near the instrumentation; the second is an area over the sea where functional firing may be conducted; the third is the area over the ship target "Bullseye." The Wallops Island and Bullseye areas are necessarily fixed. The functional firing area can be located where practicable, as long as it is over open sea and not farther than 50 miles from the station. Chart No. 7, of Enclosure (B), shows the minimum areas to satisfy these needs.

5. It is requested that the Bureau of Ordnance review these requirements and advise whether the proposed areas are sufficient from the Bureau's point of view.



G. K. FRASER

101749 0262

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HISTORY OF AIR DANGER AND AIR
WARNING AREAS AFFECTING NACTS

A. Introduction

1. At the end of the war nearly all sea areas along the coast to about 100 miles to seaward were established as danger areas. Shortly after the war was over there was considerable pressure to rescind these areas in order to accommodate the upsurge in transocean flying by the various air carriers.
2. At this time a Washington-Bermuda air route was established passing just to the north of Chincoteague and all the wartime danger area to the south of this route was rescinded. Also NATC, Patuxent, commenced action to re-establish the danger area to the north of this route. Such was the situation when NACTS was commissioned in March 1946.
3. The extent of the area requirements for the Station did not become firm until the fall of 1946. At that point a request for danger area was submitted. The chronological events and references are given below.

B. Chronology

<u>Document</u>	<u>Summary</u>
1. ASSC Meeting No. 7 18 July 1946	Establishes Assateague Island Danger Area under Patuxent Control. See Chart No. 1.
2. GESF ltr to ComNAES 5ND 1 Nov 1946	Advised of proposed area for Tactical Air Command paralleling eastern shore. See Chart No. 2 .
3. NACTS ltr to GESF NL-9(2)/ HL-23(ON6:HSJ:vh) 26 Nov 1946	Objects to Tactical Air Command area extending north of lat. 37° - 45' north.
4. NACTS ltr to ComNAES 5ND NACTS/A4-3(ON24/HFL:ep) 11 Dec 1946	Requested danger area for NACTS. Essentially area shown on Chart No. 2.
5. ComNAES 5ND ltr to GESF NCL39-5/A4-3 1F41-10 (95-HN:bn) 6 Jan 1947	Forwarded above request.
6. ComAirLant End-1 on above ltr to ComServLant 15 Jan 1947	Pointed out possible conflicts with surface forces contained in the request for danger area. As a result of this letter ComServLant called a conference on 4 Feb 1947.

ENCLOSURE (A)

- 1 -

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B. Chronology (cont'd)

- | <u>Document</u> | <u>Summary</u> |
|---|--|
| 7. NACTS ltr to ComNAES 5ND
NACTS/H1-23/F41-10 (ON26/
WRS:fmj) 27 Jan 1947 | Requested danger area over proposed
ship target in Chesapeake Bay. |
| 8. ComServLant ltr FF13-9/A3-2
H2(4)/H2(6) ser 1177
6 Feb 1947 | Report of conference held 4 Feb 1947.
Assigns Flt. Areas 3 & 4 to NACTS for
functional firing. No objections to
ship target area. Sea danger area to
be resubmitted, providing for coordination. |
| 9. NACTS ltr to CESF NACTS/
F41-10(15)(ON26/WRS:dfm)
ser 218 17 Feb 1947 | Restatement of danger area request as a
result of ComServLant conference. Divides
area in subareas A, B, and C. See Chart No. 3.
Offers:
(1) Area A - sole control by NACTS for
NACTS and NACA.
(2) Area B - control by NACTS and
coordinated use by Tactical Air Force.
(3) Area C - control by Chesapeake train-
ing group. If NACTS requires, will
make special arrangements for each
occurrence. |
| 10. Hdqtrs. Tactical Air Command,
Langley Field ltr A3B to
Secretary Airspace Sub-
committee 12 Mar 1947 | Sets forth agreement between Tactical
Air Command and NACTS resulting from
conference held 6 Mar 1947.
Agrees to:
(1) Sole control and use by NACTS of
subarea A.
(2) Operational Control of subarea B
by Tactical Air Command with NACTS
participating on the average of 3
days per week.
(3) Subarea C controlled by Tactical
Air Command for their part of that
area. NACTS to schedule with Tactical
Air Command when required. |
| 11. NACTS ltr to CESF NACTS/F41-
10(15)(ON26/WRS:dfm)
7 April 1947 | Requested danger area for ship target
in new location southwest of Tangier
Island, as a result of public hearing
held at Onancock on 2 April 1947 which
brought out serious objections by local
fisherman to location of target south-
west of Watts Island. Request contained
in original letter on subject (item 7)
to be held in abeyance. See Chart No. 3. |

ENCLOSURE (A)

- 2 -

REPRODUCED AT THE NATIONAL ARCHIVES

Chronology (cont'd)

<u>Document</u>	<u>Summary</u>
12. Washington ASSC Meeting No. 65 14 July 1947	Established Great Machipongo Inlet Danger Area for NAOIS and Tactical Air Command. Area requested by NAOIS to be an Ordnance Test and Research Range. Area requested by Tactical Air Command to be a bombing and aerial Gunnery range. See Chart No. 3. Coordination of overlapping areas as follows: Subarea A - NAOIS Control and agrees to let Tactical Air Command use up to 50% of operating days. Subarea B - Tactical Air Command Control and agrees to let NAOIS use 50% of time. Subarea C - Outside of Army area NAOIS responsibility.
13. Washington ASSC Meeting No. 77 14 Aug 1947	Approved ship target area southwest of Tangier Island requested by Item 11 above as Guided Missiles Target. Effective 1 Oct 1947. See Chart No. 3.
14. NAOIS ltr to CESSF NAOIS/ F41-10(15)(ON26/WRS:vb) 15 Oct 1947	Reviews danger areas in response to request of ASSC Meeting No. 80 and CNO directive. Gives additional data requested on ship target at Tangier Island Danger Area and NAOIS portion of Great Machipongo Inlet Danger Area. Recommends portion of latter inside 3 mile limit be called "Wallops Island Danger Area."
15. Washington ASSC Meeting No. 88 6 Nov 1947	Establishes policy of Airspace Warning Areas outside 3 mile limit.
16. NAOIS ltr to CESSF NAOIS/ F41-10(15)(ON26/WRS:vb) 19 Feb 1948	Requested offshore warning areas in place of previously designated danger areas. See Chart No. 4.

ENCLOSURE (A)

- 3 -

REPRODUCED AT THE NATIONAL ARCHIVES

B. Chronology Cont'd
Document

16.

Summary

Recommended:

- (a) Designation of Great Machipongo Inlet Offshore Warning Area as portion of previous danger area that is outside 3 mile limit.
- (b) Designation of Chincoteague Offshore Warning Area over old fleet areas 3 and 4, which were assigned NACTS by ComServLant.
- (c) Redesignation of remaining portion of Great Machipongo Inlet Danger Area inside 3 mile limit as "Wallops Island Danger Area."

17. ComNABS 5ND End-1 on
above ltr

Recommended establishment of "Wallops Island Danger Area." Concurred in Great Machipongo Inlet Offshore Warning Area. Did not recommend establishment of Chincoteague Offshore Warning Area as area to be used by NACTS under effective agreement between NATC, ComNABS 5ND, and ComServLant.

18. Washington ASSC
Meeting No. 114
8 Apr 1948

Reestablishes and rejustifies danger and caution areas and establishes airspace warning areas as follows: See Chart No.5.

- (a) Tangier Island Danger Area - Guided Missiles on ship target using agency NACTS.
- (b) Chincoteague Inlet Danger Area and Airspace Warning Area - (In accord with NACTS original danger area request.) Using agencies - NACTS, NACA, and Tactical Air Command.
- (c) Assateague, Md., Danger Area and Airspace Warning Area (as per original assignment to NATC Patuxent). Using agencies - NAS Patuxent and NAS Chincoteague and fleet firing.

ENCLOSURE (A)

- 4 -

REPRODUCED AT THE NATIONAL ARCHIVES

B. Chronology cont'd

Document
19. Washington ASSC
Meeting No. 125
6 Aug 1948

Summary
Discusses establishment of control areas for ingress and egress to coast from off-shore boundary New York Oceanic Control Area. Much controversy developed. As affected NAOTS the following action was taken:

(a) Millville Control Area established. Resulting in loss of outer portion of Assateague Island Air Warning Area including portion of fleet areas 3 and 4 assigned NAOTS.

(b) Washington-Bermuda Control Area referred to next higher level for resolution. Navy member dissenting due to opposition from Fleet and NAOTS. See Chart No. 6.

20. Washington ASSC
Meeting No. 130
30 Sept 1948

(1) Disapproved designation of old Washington-Bermuda air route as control area.

(2) Established a Norfolk Control Area eastward from Virginia Capes.

(3) Revised Assateague Air Danger and Airspace Warning Area in accord with establishment of Norfolk Control Area.

(4) Revised Chincoteague Inlet Airspace Warning Area to conform to establishment of Norfolk Control Area.

(5) Established Patuxent Danger Area including Tangier Island Danger Area.

21. Washington ASSC
Meeting No. 138
18 Jan 1949

Established Chincoteague, Virginia, Capes Airspace Warning Area as that area bounded by the Millville Control Area, Norfolk Control Area and the 3 mile limit. Northeast half of area controlled by NATC Patuxent and remainder by ComNABS 5ND for air operations. Surface scheduling authority designated as ComServLant. See Chart No. 7.

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B. Chronology cont'd

<u>Document</u>	<u>Summary</u>
22. NAOTS ltr to Navy Member New York Airspace Sub- committee NAOTS/NL-13 (ON26/WRS:ebh) 18 Mar 1949	Supplied rejustification for the Chincoteague Inlet Danger Area. Requested extension of danger area to lat. 38° north. Both NACA and NAOTS operations increasing.
23. ComServLant Dispatch 302002Z Sept 1949	Establishes Air Force Areas XRay above 10,000 feet along the coast of eastern shore. See Chart No. 7.

W-25 U.S. Naval Guided Missile Unit No. 11.

1953 Correspondence to the Chief of the Bureau of Ordnance, dated 23 September, regarding Special Training, Monthly Report, Submission of. Record Group 74; Entry 1005; Box 24; File NA111; National Archives, College Park, MD.

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~~CONFIDENTIAL~~
~~SECURITY INFORMATION~~

GMU#11:FJH:cn
A9-4

19 Aug 21-S-9: Conducted two captive flights of missile for lead navigation tests; targets - First run; BULLSEYE - Second run; USS KRAUSE (EAG 151)

Test Personnel: Mr. PETERS (FED) arrived on board.

20 Aug 21-F-17: Conducted successful test of the engine at test cell.

21-S-9: Conducted a series of captive homing runs against USS KRAUSE (EAG 151) for purposes of testing operation of lead navigation circuitry.

Torpedoes: Completed overhaul of Mk 13-10 torpedo register number 108407.

Special Training: The following instruction classes were conducted:

Subject	No. Students	Instructor
Missile Autopilots	15 (GMU#3)	H. E. ERCEG, ATC
Type "E" Autopilot	15 (GMU#3)	H. E. ERCEG, ATC
PETREL Destruct System	15 (GMU#3)	G. D. DAVIS, ATL
PETREL Altimeters	15 (GMU#3)	G. D. DAVIS, ATL
DOVE Timing Sequence	12 (GMU#11)	A. F. GORDON (GMU#3)
DOVE Block Diagram	12 (GMU#11)	A. F. GORDON (GMU#3)
DOVE Handling Movies	12 (GMU#11)	J. B. MILAM (GMU#3)
DOVE Assembly & Maintenance	12 (GMU#11)	J. B. MILAM (GMU#3)
DOVE Operational Demonstration	12 (GMU#11)	A. M. MICHAELS (GMU#3)

21 Aug Test Personnel: Mr. PETERS (FED) departed.

24 Aug Torpedoes: Commenced overhaul of Mk 13-10 torpedo register number 107986.

Special Training: C. S. LEONARD, ADC, USN, and G. C. ALLEN, ADL, USN, transferred on TAD to FED, Farmingdale, L.L., N.Y. for instruction on YJ-44 engines.

Four unit technicians were given instruction and requalified in the operation of SP-1M radar.

25 Aug S-9: Missile was captive flown against BULLSEYE target for tests of range switch firing accuracy.

Personnel: NEERGAARD, R. W., ATL, USN, was transferred to NATTC, Jacksonville, Florida for duty.

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~~SECURITY INFORMATION~~

GMU#11:FJH:cn
 A9-4

- 10 Aug P-1: Received PETREL missile P-1 less center section and intelligence. This constituted the first delivery of FGMD service engineered missiles.
- Torpedoes: Commenced overhaul of Mk 13-10 torpedo register number 108407.
- Special Training: FICCHI, J. R., TM2, USN, was transferred from NOU, Key West, Fla. to NAUWS, Key West for the seven week course of instruction in the Mk 21-2 torpedo.
- Test Personnel: Mr. CRAIG (NBS Corona) departed.
- 12 Aug 21-S-9: Suspended missile on P4Y-2B aircraft for plane check; checkout satisfactory. Special instrumentation installed in aircraft for commencement of captive flight tests for test of lead navigation intelligence.
- 13 Aug Special Duty: A radar watch was established by unit technicians on SP-1M radar for tracking of hurricane core.
- 14 Aug Test Personnel: Mr. J. P. NIGRO (NBS Washington, D.C.) arrived on board for the day.
- 18 Aug 21-S-9: Conducted two captive flights for test of radar lead navigation. First flight against Winter Quarter Lightship was successful. Second flight, against USS KRAUSE (EAG 151), was cancelled due to failure of vertical gyro.
- Special Training: Commenced a reciprocal training program with NGMU No. Three to provide training for personnel of NGMU No. Three and NGMU No. Eleven in guided missiles other than their own project. Lectures delivered as follows:

Subject	No. Students	Instructor
PETREL Orientation	15 (GMU#3)	LT F.J. HEILER
PETREL Intelligence System	15 (GMU#3)	LT F.J. HEILER
PETREL Stabilization	15 (GMU#3)	LT F.J. HEILER
PETREL Propulsion	15 (GMU#3)	C.S. LEONARD, ADC
PETREL Propulsion Lab.	15 (GMU#3)	C.S. LEONARD, ADC
DOVE Background	12 (GMU#11)	*J.D. TACY, ATL
DOVE General Theory	12 (GMU#11)	J. D. TACY, ATL
DOVE Operation	12 (GMU#11)	J. D. TACY, ATL
DOVE Movie	12 (GMU#11)	J. D. TACY, ATL

* Attached to GLU#3

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~~SECURITY INFORMATION~~

GMU/11:FJH:cn
A9-4

- 4 Aug 21-S-6: Suspended missile on aircraft and launched in free flight at sea against USS KRAUSE (EAG 151) as one of a series of tests for NBS evaluation program. Launch was normal and performance was as recorded in NBS Report of Free Flight (Secret).
- 21-S-7: Suspended missile on aircraft for scheduled launch. On approach to target launch was cancelled due to loss of AGC. Missile was returned to base and repaired. Missile was then launched in free flight at sea against USS KRAUSE. Launch was normal and performance was as recorded in NBS Report of Free Flight (Secret).

Special Training: The following men were transferred to Naval Advanced Undersea Weapons School, Naval Base, Key West, Fla. to commence a seven week course of instruction in the Mk 21 Mod 2 torpedo:

VAN WINKLE, J. D.	TAC	USN
STRUNK, D. W.	TML	USN
BENICKE, H. J.	TML	USN
GILLASPIE, C. L.	TML	USN

Test Personnel: Mr. TOWNSEND, Mr. REGAN and Mr. MIKUS (all from FED) arrived on board.

- 5 Aug 21-S-3: Missile was suspended for scheduled launch. After approaching the target the exercise was cancelled due to foul weather.

Test Personnel: Mr. CRAIG (NBS Corona) arrived on board.

- 6 Aug 21-S-3: Missile was suspended on aircraft and launched at sea against USS KRAUSE (EAG 151) to complete current series of tests for NBS evaluation program. Launch was normal and performance was as recorded in NBS Report of Free Flight (Secret).

Test Personnel: Mr. TOWNSEND, Mr. REGAN and Mr. MIKUS (FED) departed.

- 7 Aug Special Training: A lecture was delivered to 20 unit technicians by Mr. Julian CRAIG of NBS subject - "Petrel Lead Navigation"

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REPRODUCED AT THE NATIONAL ARCHIVES

U. S. NAVAL GUIDED MISSILE UNIT NO. 11
U. S. Naval Aviation Ordnance Test Station
Chincoteague, Virginia

GMU#11:FJH:cn
A9-4
Ser: 026

SEP 16 1953

~~CONFIDENTIAL~~
~~SECURITY INFORMATION~~

Na III
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From: Officer in Charge
To: Chief, Bureau of Ordnance (Re9c)
Via: Commanding Officer, Naval Aviation Ordnance Test Station,
Chincoteague, Virginia

Subj: Monthly report; submission of

Ref: (a) BUOED ltr NALLI (Re9c) JWT:jgb of 24 Aug 1952
(b) BUOED ltr Re9c-WCV:rme S78-1(126) Ser 44014 of 27 Aug 1952

Encl: (1) Percentage breakdown of unit employment

1. In compliance with reference (a) the following report is herewith submitted with enclosure (1), as directed by reference (b), covering the period 1-31 August 1953:

1 Aug Continued projects:

- (a) Flight tests of PETREL missiles 21-S-3, 21-S-6 and 21-S-7.
- (b) Preparation for series of Mk 21-2 torpedoes to be air launched with PETREL appendages at Key West, Florida
- (c) Assembly and checkout of PETREL missiles 21-F-17 and 21-S-9.
- (d) Continued attendance of 1 Torpedoman on TAD under instruction at NOU, Key West, Florida.

(e) Personnel	Officers	Enlisted
On board	4	53
Allowance	3	53

Test Personnel: Mr. G. W. LEAHY and Mr. K. C. O'LEARY, NBS Test Directors, on board this date.

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~~CONFIDENTIAL~~

REPRODUCED AT THE NATIONAL ARCHIVES

~~CONFIDENTIAL~~
~~SECURITY INFORMATION~~

U. S. NAVAL GUIDED MISSILE UNIT NO. 11
PERCENTAGE BREAKDOWN OF UNIT EMPLOYMENT
PERIOD 1-31 AUG 1953

ASSEMBLY AND CHECKOUT OF TEST MISSILES	31.0%
HANDLING EQUIPMENT, MODIFICATION & TESTING	00.0%
HANDLING EQUIPMENT, MAINTENANCE	00.7%
TORPEDO OVERHAUL AND MAINTENANCE	09.8%
ENGINE MODIFICATIONS AND MAINTENANCE	02.0%
SUSPENSION MODIFICATION & MAINTENANCE	00.2%
AUXILIARY EQUIPMENT MAINTENANCE	02.2%
ROUTINE FACILITIES MAINTENANCE	04.0%
FORMAL INSTRUCTION (Movies & Lectures)	05.0%
INFORMAL TRAINING (On the Job & Studying)	09.6%
ADMINISTRATIVE	10.0%
MILITARY DUTIES	12.5%
SICKNESS, LEAVE, SPECIAL LIBERTY	06.0%
FLIGHT TIME	03.0%
SERVICES TO NAAS/NACTS	04.0%
	<hr/>
	100.0%

ENCLOSURE (1)

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092553 0080

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~~SECURITY INFORMATION~~

23 SEP 1953

NAOTS
(ON18:BW:Jb)
A9-4 0282

FIRST ENDORSEMENT on OINC, GMU#11, NAOTS, Chincoteague, Va., Conf ltr
GMU#11:FJH:cn A9-4 ser 026 of 16 Sep 1953

From: Commanding Officer, NAOTS, Chincoteague, Virginia
To: Chief, Bureau of Ordnance (Re9c)

Subj: Monthly report; submission of

1. Forwarded.

H. T. JOHNSON

P. W. Jackson
P. W. JACKSON
By direction

Copy to:
CNO (Op-51)
NBS, Corona, Calif.
NBS, Washington, D. C.
OINC, Naval Personnel Research
Field Activity, Washington, D. C.
OINC, GMU#11, NAOTS,
Chincoteague, Va.

DECLASSIFIED
E.O. 12958, Sec. 2.3
NW 26608
By HRM/mjm Date 10/20/05

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GMU/11:FJH:cn
19-4

Special Training: A general interest movie on DOVE, PETREL, and GREEBE was shown to fifteen unit personnel.

C. S. LEONARD, ADC, USN, and G. C. ALLEN, AD1, USN, returned from FED, Farmingdale, Long Island, N.Y.

Two unit technicians were instructed and requalified on the SP-1M radar.

31 Aug 21-S-9: Conducted captive flights of missile for lead navigation tests against USS MISSISSIPPI.

Special Training: Four unit technicians were instructed and requalified on the SP-1M radar.

Accomplishments noted:

- (a) Launch of PETREL missiles 21-S-3, 21-S-6 and 21-S-7.
- (b) Ten captive flight tests of 21-S-9 for test of lead navigation intelligence.
- (c) Continued checkout of PETREL missile 21-F-17.
- (d) Overhaul of torpedo 108407.
- (e) Delivery of 23 training classes.
- (f) Reception of 18 training classes from NGMU/3.

E. W. Bode
E. W. BODE.

Copy to:
Op-51
NBS, Corona
NBS, Washington
NPRFA, Washington

092553 1080

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~~SECURITY INFORMATION~~

GMU#11:FJH:en
A9-4

Special Training: The following instruction classes were conducted:

Subject	No. Students	Instructor
PETREL Payload	15 (GMU#3)	R. E. THOMPSON, TMC
Torpedo Mk 21 Guidance	15 (GMU#3)	ENS. L.B. CRANE
Payload Laboratory	15 (GMU#3)	G. C. DEPUE, TMC
PETREL Tactical Concepts	15 (GMU#3)	LT F.J. HEILER
DOVE Background	12 (GMU#11)	*J. D. TACY, ATL
DOVE General Theory	12 (GMU#11)	J. D. TACY, ATL
DOVE Operation	12 (GMU#11)	J. D. TACY, ATL
DOVE Movie	12 (GMU#11)	J. D. TACY, ATL

* Attached to GMU#3

26 Aug Special Training: Four unit technicians were instructed and requalified in operation of SP-1M radar.

Visitors: LCDR HUTCHIN(CNO) and Mr. CASTELLO (NOEU) arrived on board.

27 Aug 21-S-9: Missile was captive flown against BULLSEYE target for lead navigation tests.

Special Training: General interest movie of PETREL, GREBE, and DOVE was shown to twenty unit personnel.

The following instruction classes were conducted:

Subject:	No. Students	Instructor
PETREL Radar	15 (GMU#3)	J. M. LEMASTERS, ATC
PETREL Stabilization	15 (GMU#3)	J. M. LEMASTERS, ATC
PETREL Launching	15 (GMU#3)	W. E. ROPE, FTC
PETREL Demonstration	15 (GMU#3)	W. H. MCCARTHY, ATC
DOVE Timing Sequence	12 GMU#11	*A. F. GORDON, ATL
DOVE Tail & Nose Block	12 GMU#11	*A. F. GORDON, ATL
DOVE Handling Movies	12 GMU#11	*J. B. MILAM, AOL
DOVE Assembly	12 GMU#11	*J. B. MILAM, AOL
DOVE Demonstration	12 GMU#11	*A. M. MICHAELS, ATC

Visitors: Mr. CASTELLO (NOEU) and LCDR HUTCHIN(CNO) departed. Mr. SANBORN and LCDR DILLH (Both NOEU) arrived on board for the day.

28 Aug 21-S-9: Suspended missile for scheduled lead navigation test against USS MISSISSIPPI. Test cancelled after first approach due to stabilization failure.

Personnel: FROIO, B.A., AO3, USN, and STERLING, J. J., AT2(T), USN, were transferred to VP-24, NAS, Patuxent River, Md. for duty.

092553 1080

~~CONFIDENTIAL~~

W-26 Department of the Navy, Bureau of Ordnance.

1953 Correspondence to the U.S. Naval Aviation Ordnance Test Station, dated 9 November, regarding 2.74 Aircraft Recoilless Rocket Launcher, Support of. Record Group 74; Entry 1005; Box 24; File NA111; National Archives, College Park, MD.

REPRODUCED AT THE NATIONAL ARCHIVES

MENT
FORM 1839 (Rev. 8-50)

DEPARTMENT OF THE NAVY
BUREAU OF ORDNANCE
WASHINGTON 25, D. C.

IN REPLY REFER TO

DECLASSIFIED
E.O. 12958, Sec. 3.3

ReSt-JOW:gk
na 111
Ser

~~CONFIDENTIAL SECURITY INFORMATION~~
From: Chief, Bureau of Ordnance

NW 26609
By HRM/mjm Date 10/20/05

To: Commanding Officer
U. S. Naval Aviation Ordnance Test Station
Chincoteague, Virginia

265886

9 NOV 1953

Subj: 2.75 Aircraft Recoilless Rocket Launcher; support of

Ref: (a) NOTS conf ltr Ser 01282 dtd 26 Aug 1953

Encl: (1) Ordnance Specification; Development of a 2.75"
Aircraft Recoilless Launcher NavOrd 055781 dtd
4 June 1953

1. It is requested that the task assignment described below be undertaken. It is further requested that the Bureau be notified if the desired completion date cannot be met without interference to previous assignments, with information as to how previous assignments will be affected if this date is met and what date can be met without interference.

TASK ASSIGNMENT NO. NAOTS-A-8b-123-1-54	ESTIMATED ANNUAL EXPENDITURE RATE	DESIRED COMPLETION DATE 30 June 1954
PROJECT NO. A-8b-123	BUORD LIAISON ENGINEER Mr. J. O. Watson	SECURITY CLASSIFICATION Confidential

TECHNICAL DATA AND INSTRUCTIONS:

2. Columbia Research and Development Corporation is currently developing, under Contract NOrd 10786, an experimental 2.75" Aircraft Recoilless Rocket Launcher complying with the specifications of enclosure (1), and containing six (6) 2.75" recoilless single shot rifles to fire the 2.75" spin stabilized aircraft rocket ammunition T241. A firing launcher is currently scheduled for completion in November 1953 for ground and airborne test and evaluation. A similar launcher developed by Harvey Machine Company is currently undergoing test and evaluation at the Naval Ordnance Test Station, Inyokern, as reported in enclosure (1) to reference (a), which has been previously delivered.

3. It is requested that the Naval Aviation Ordnance Test Station, Chincoteague test and evaluate the Columbia Research and Development Corporation 2.75" Aircraft Recoilless Rocket Launcher as follows:

a. Pre-firing Ground Tests.

(1) Conduct measurements and tests, where applicable, on the subject launcher as specified under part B paragraph 1 and 2 in NAVEXOS P-547, "Aircraft Guns Test and Evaluation Procedure Manual."

~~CONFIDENTIAL~~ 10-26

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9 NOV 1953

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- (2) The Blue print check as required under paragraph 2(b) may be superseded by the contractor's blueprint measurements due to the experimental nature of the launcher.
- (3) Obtain displacement time curves showing the relationship between the nose and tail cone doors, the muzzle and nozzle blast tubes, and the actuating struts.
- (4) Determine the time from energizing the firing switch to completion of launcher cycle, ie, opening the nose and tail cone doors, extension of muzzle and nozzle blast tubes, retraction of muzzle and nozzle blast tubes and closing of the nose and tail cone doors.
- (5) Determine the time from energizing the firing switch to opening of the nose and tail cone doors.
- (6) Determine the time from energizing the firing switch to extension of muzzle and nozzle blast tubes.
- (7) Using high speed motion pictures or other suitable means obtain data on the action of the nose and tail cone doors and muzzle and nozzle blast tubes.
- (8) Make frequent and careful inspections of the launcher and all components to determine wear, parts breakage, deformation, etc.
- b. Ground Firing Tests.
- (1) Conduct measurements and tests, where applicable, on the subject launcher as specified under part B paragraph 3 thru 8 in NAVEXOS P-547.
- (2) First rounds - Set up individually each T190 recoilless rifle with muzzle and nozzle blast tubes in place not assembled in the 2.75 Aircraft Recoilless Rocket Launcher Ex-1 and fire one (1) standard T243 Spin Stabilized Aircraft Rocket. Record recoil unbalance of each T190 rifle on a pendulum mount or other suitable installation.
- (3) Additional rounds - With the T190 rifles installed in the 2.75" AAR Launcher Ex-1, assuming clockwise numbering of the T190 recoilless rifles, fire T243 SSAR ammunition in the following sequence:
- (a) Rifle number 6.
 - (b) Rifle numbers 3 and 6 with 5-7 millisecond interval.
 - (c) Rifle numbers 5 and 6 with 5-7 millisecond interval.
 - (d) Rifle numbers 2, 4 and 6 with 5-7 millisecond interval.

GPO 16-20171-3

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(e) Rifle numbers 2, 4 and 6 salvo.

(f) Rifle numbers 1, 3, 5, 2, 4 and 6 with 5-7 millisecond interval.

Es

(g) Rifle numbers 1, 3 and 5 salvo, 2, 4 and 6 salvo with ten millisecond interval between salvo's.

PL

(h) Fire four (4) bursts per schedule (g) above.

(i) Rifle numbers 1, 3 and 5 salvo using T242 SSAR ammunition.

(j) Fire two (2) bursts per schedule (g) above using T242 SSAR ammunition. During the above firing the 2.75" AAR Launcher Ex-1 will be mounted simulating aircraft mounting conditions with the necessary instrumentation to record the trunnion forces transmitted to the mount.

Co

(k) Fire four (4) bursts per schedule (g) above using T242 SSAR ammunition while mounted on the outboard wing or wing tip rack of a suitable VF type aircraft for a final check of the trunnion forces transmitted to the aircraft and additional data as necessary, including the general reliability of the launcher operation.

Ma

c. Air Firing.

(1) Conduct measurements and tests where applicable on the subject launcher as specified under part B paragraph 9 in NAVEXOS P-547.

Re

3. In view of the developmental nature of the subject launcher, it is requested that a copy of the firing records, including rounds fired, type ammunition used, malfunctions and causes if determined, parts breakage and general observations by the proof officer, be forwarded monthly to the Bureau of Ordnance (Re8). It is further requested that the Bureau of Ordnance be notified of any modifications or corrective action deemed necessary by the Naval Aviation Ordnance Test Station, Chincoteague to eliminate malfunctions or improve the performance characteristics of the subject launcher.

Re8

ANK 10/14

Re8

10/15

Re8

Rexa

Rex-1

Rex-2

Fi

M. F. SCHOEFFEL

Sp

Copy to:
Rexa, Rex-1, Rex-2
Mad, Adlb, Prep 15 Oct 1953
Ext 66869

J. M. ELLIOTT
By direction

In

~~CONFIDENTIAL~~

W-27 Department of the Navy, Office of the Naval Material.

1955 Correspondence to the Chief of the Bureau of Ordnance, dated 21 November, regarding DoD Identification Code for Interchangeability of Ammunition and Explosives. Record Group 74; Entry 1008; Box 103; Folder XI, National Archives, College Park, MD.



DEPARTMENT OF THE NAVY
OFFICE OF NAVAL MATERIAL
WASHINGTON 25, D. C.

IN REPLY REFER TO
M70A/LSS:cm

21 NOV 1955

REPRODUCED AT THE NATIONAL ARCHIVES

From: Chief of Naval Material
To: Chief, Bureau of Ordnance

Subj: Department of Defense Identification Code for Interchangeability
of Ammunition and Explosives

Ref: (a) ONM ltr M70A/LSS:ajs Ser 191 of 26 Sep 1955

Encl: (1) Copies of subject codes

1. Reference (a) forwarded identification code assignments for FSC Class 1336 (Guided Missile Warheads and Explosive Components). Since this listing was promulgated, several additions and changes have been made to the generic descriptions. Forwarded as enclosure (1) are copies of the revised listing which are to be used in lieu of the previous list.

112555 0059

H.J. GOLDBERG
Assistant Chief of Naval Material (Supply Programs)

W-27

OCT 24 1955

REPRODUCED AT THE NATIONAL ARCHIVES

DEPARTMENT OF DEFENSE IDENTIFICATION CODE FOR
 INTERCHANGEABILITY OF AMMUNITION AND EXPLOSIVE SUPPLIES
 FSC CLASS 1336 (GUIDED MISSILE WARHEADS AND EXPLOSIVE COMPONENTS)

<u>Code</u>	<u>Generic Description</u>	<u>Code</u>	<u>Generic Descriptions</u>
V001	ARMING MECHANISM, GUIDED MISSILE, T93 SERIES	V021	BOOSTER, X230A6 (GRAIN LOADED) (TALOS)
V005	BOOSTER, MK2 & MODS (GRAIN LOADED) (TERRIER)	V022	BOOSTER, X230A6 (PLASTER LOADED) (TALOS)
V006	BOOSTER, MK2 & MODS (PLASTER LOADED) (TERRIER)	V023	BOOSTER, X230A6 (EMPTY) (TALOS)
V007	BOOSTER, MK2 AND MODS (EMPTY) (TERRIER)	V024	BOOSTER, COMPATIBLE (GRAIN LOADED) (TERRIER)
V008	BOOSTER, MK3 AND MODS (GRAIN LOADED) (TERRIER)	V025	BOOSTER, COMPATIBLE (PLASTER LOADED) (TERRIER)
V009	BOOSTER, MK3 AND MODS (PLASTER LOADED) (TERRIER)	V026	BOOSTER, COMPATIBLE (EMPTY) (TERRIER)
V010	BOOSTER, MK3 AND MODS (EMPTY) (TERRIER)	V066	FUZE, CONTACT EK129 (SIDEWINDER)
V011	BOOSTER, MK4 AND MODS (GRAIN LOADED) (TERRIER)	V071	CORD ASSEMBLY, DETONATING M24
V012	BOOSTER, MK4 AND MODS (PLASTER LOADED) (TERRIER)	V072	CORD, DETONATING, GUIDED MISSILE
V013	BOOSTER, MK4 AND MODS (EMPTY) (TERRIER)	V077	CYLINDER, RELEASE, PROPELL VALVE, XM4
V017	BOOSTER, X230A3 (GRAIN LOADED) (TALOS)	V080	EXERCISE HEAD (TALOS)
V018	BOOSTER, X230A3 (PLASTER LOADED) (TALOS)	V081	EXERCISE HEAD (SIDEWINDER)
V019	BOOSTER, X230A3 (EMPTY) (TALOS)	V082	EXERCISE HEAD EK-1 MOD 1 (with Telemeter) (TERRIER)
V020	BOOSTER, X230A5 (GRAIN LOADED) (TALOS)	V083	EXERCISE HEAD EK-1 MOD 1 (without Telemeter) (TERRIER)

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<u>Code</u>	<u>Generic Description</u>	<u>Code</u>	<u>Generic Description</u>
V084	EXERCISE HEAD EX-1 MOD 2 (with Telemeter) (TERRIER)	V200	MOTOR, T58 E2 for MK2 WARHEAD <i>CAR 1</i>
V085	EXERCISE HEAD EX-1 MOD 2 (without Telemeter) (TERRIER)	V205	ROCKET MOTOR, MK15, MOD 0 (GRAIN LOADED) (SIDEWINDER)
V088	FLASH SIGNAL, NOTS Model 752A (TALOS)	V206	ROCKET MOTOR, MK15, MOD 0 (PLASTER LOADED) (SIDEWINDER)
V089	FLASH SIGNAL, MK 31 (TERRIER)	V256	SAFETY AND ARMING DEVICE ELECTRICAL (TALOS)
V090	FLASH, SIGNAL, NOTS Model 751A (SPARROW)	V257	SAFETY AND ARMING DEVICE ELECTRICAL (TERRIER)
V100	FUZE INFLUENCE, T3000 (TALOS)	V258	SAFETY AND ARMING DEVICE MECHANICAL (TERRIER)
V101	FUZE INFLUENCE, T3001 (TERRIER)	V259	SAFETY AND ARMING DEVICE MECHANICAL (SPARROW)
V102	FUZE INFLUENCE, T3002 (SPARROW)	V260	SAFETY AND ARMING DEVICE MECHANICAL (TALOS)
V105	FUZE INFLUENCE, T2061 (SIDEWINDER)	V261	SAFETY AND ARMING DEVICE (TALOS W)
V108	FUZE INFLUENCE, EX29 (SIDEWINDER)	V280	SELF DESTRUCT CHARGE FOR W-VERSION (TALOS)
V124	FUZE, TAIL, T1400	V281	SELF DESTRUCTOR CHARGES, EX-8 (TERRIER)
V130	FUZE, NOSE, T1402	V282	SELF DESTRUCTOR CHARGES, EX-16 (TERRIER)
V135	FUZE, T1403 for MK2 WARHEAD	V283	SELF DESTRUCT CHARGES, EX-14 (TALOS)
V155	IGNITER, JATO UNIT, GUIDED MISSILE, M24	V284	SELF DESTRUCT CHARGES, EX-18 (TALOS)
V160	JATO UNIT, GUIDED MISSILE, M5	V305	SUSTAINER ROCKET MOTOR, MK1 & MODS (GRAIN LOADED) (TERRIER)
V180	JATO UNIT, T50		

REPRODUCED AT THE NATIONAL ARCHIVES

<u>Code</u>	<u>Generic Description</u>	<u>Code</u>	<u>Generic Description</u>
V306	SUSTAINER ROCKET MOTOR, MK1 & MODS (PLASTER LOADED) (TERRIER)	V358	TRACKING FLARE, T-140 (SPARROW)
V307	SUSTAINER ROCKET MOTOR, MK1 & MODS (EMPTY) (TERRIER)	V359	TRACKING FLARE (NAMTC DESIGN) (SPARROW)
V308	SUSTAINER ROCKET MOTOR, MK2 & MODS (GRAIN LOADED) (TERRIER)	V383	WARHEAD EX6 (TALOS)
V309	SUSTAINER ROCKET MOTOR, MK2 & MODS (PLASTER LOADED) (TERRIER)	V384	WARHEAD EX7 (TALOS)
V310	SUSTAINER ROCKET MOTOR, MK2 & MODS (EMPTY) (TERRIER)	V385	WARHEAD EX14 (TALOS)
V311	SUSTAINER ROCKET MOTOR, MK5 MOD 0 (GRAIN LOADED) (ADV. TERRIER)	V386	WARHEAD EX17 (TALOS)
V312	SUSTAINER ROCKET MOTOR, MK5 MOD 0 (PLASTER LOADED) (ADV. TERRIER)	V387	WARHEAD EX18 (PLASTER LOADED) (SIDEWINDER)
V313	SUSTAINER ROCKET MOTOR, MK 5 MOD 0 (EMPTY) (ADV. TERRIER)	V388	WARHEAD EX18 (SIDEWINDER)
V314	SUSTAINER ROCKET MOTOR, X113C4 (GRAIN LOADED) (SPARROW)	V390	WARHEAD, MK 2, MOD 2 for GAR 1
V315	SUSTAINER ROCKET MOTOR X113C4 (PLASTER LOADED) (SPARROW)	V391	WARHEAD MK5-3 (PLASTER LOADED) (TERRIER)
V316	SUSTAINER ROCKET MOTOR X113C4 (EMPTY) (SPARROW)	V392	WARHEAD, MK5-3 (EMPTY) (TERRIER)
V356	TRACKING FLARE, M136 (TERRIER)	V393	WARHEAD, MK5-3 (LOADED) (TERRIER)
V357	TRACKING FLARES, T-132 (TALOS)	V395	WARHEAD, MK5-4 (PLASTER LOADED) (TERRIER)
		V396	WARHEAD, MK5-4 (EMPTY) (TERRIER)
		V397	WARHEAD, MK5-4 (LOADED) (TERRIER)
		V399	WARHEAD, MK5-5 (PLASTER LOADED) (TERRIER)
		V400	WARHEAD, MK5-5 (EMPTY) (TERRIER)

REPRODUCED AT THE NATIONAL ARCHIVES

<u>Code</u>	<u>Generic Description</u>	<u>Code</u>	<u>Generic Description</u>
V401	WARHEAD, MK5-5 (LOADED) (TERRIER)	V632	WARHEAD BOOSTER, INFLUENCE FUZE (for use with SIDEWINDER EXERCISE HEAD) (SIDEWINDER)
V403	WARHEADS MK7-0 (LOADED) (SPARROW I)	V682	DETONATOR MK60 (PETREL)
V405	WARHEAD, MK7-0 (PLASTER LOADED) (SPARROW I)		
V407	WARHEAD, INERT, T23E2		
V408	WARHEAD, INERT, T25E1		
V409	WARHEAD, GUIDED MISSILE, T3E3		
V410	WARHEAD, FRAGMENTATION, T22E3		
V411	WARHEAD, FRAGMENTATION, M2		
V412	WARHEAD, FRAGMENTATION, M3		
V413	WARHEAD, FRAGMENTATION, M4		
V625	WARHEAD BOOSTER, CONTACT FUZE (for use with warhead) (SIDEWINDER)		
V626	WARHEAD BOOSTER, CONTACT FUZE (for use with exercise head) (SIDEWINDER)		
V627	WARHEAD BOOSTER, MK26-0 (TERRIER)		
V628	WARHEAD BOOSTER, EX5 & MODS (TALOS)		
V629	WARHEAD BOOSTER, EX4-1 (SPARROW I)		
V630	WARHEAD BOOSTER, EX3 (TERRIER)		
V631	WARHEAD BOOSTER, INFLUENCE FUZE (for use with SIDEWINDER WARHEAD) (SIDEWINDER)		

W-28 U.S. Naval Aviation Ordnance Test Station.

1953 Technical Report on Evaluation of Gunboat Point, Wallops Island, Virginia;
NAOTS Report No. 46, dated 21 August. Record Group 74; Box 865; National
Archives, College Park, MD.

Unable to locate this document at this time. It is not directly referenced in the report.

W-29 Fifth Naval District.

Drawing, dated December 1949; Five Year Shore Station Development Program, NAOTS Wallops Island Facilities, Chincoteague, VA; Site Plan; Development Program for Year 1951. Record Group 74; Entry 1001; Box 62; File NN-Z; National Archives, College Park, MD.

Priority Bu Ord
 * Joint - Bu Ord & Bu Aer

FIVE-YEAR PROGRAM FISCAL YEAR 1949 TO 1954, INCL.
 NAAS - NAOTS LOCATION Chincoteague, Va. DATE OF SUBMITTAL 21 January 1947

WT-Misc-181/47

ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA SIZE	TYPE	LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
					AVAIL	REQD		LUMP SUM	YO LAB		
1	1#	Acquisition of Land for Test Facilities	(Wallops Isl. area)			6,615 acres	\$54,500 ✓	X		Required for testing.	Recommended for inclusion in 1948 PW Budget by CNO.
2	2#	Acquisition of Land for Housing	(SW corner)			125 acres	40,300 ✓	X		Land required to expand station housing development.	Same.
3	3#	Completion of Range Facilities				See #1	2,275,000 ✓	X		Required for testing.	Same
4	4*	Improve Water Supply			X		45,000	X		Consoer, Townsend and Associates report recommends in view of new housing development.	Same (formerly #3, Station List, #5ND-6-5).
5	5*	Elevated Water Storage			X		112,000	X		Recommended in same report as #4.	Same (formerly #4, Station List, #5ND-6-6).
6	6*	Expansion of Sewage Plant	2,500 people		X		52,500 ✓	X		Recommended by Consoer and Associates report on Sewage System to accommodate housing development.	Same (formerly #2, Station List, #5ND-6-4).
	7#	Additional Quarters (5 Officers, 20 Enlisted, and 12 Civilians)			X	125 acres (See #2)	455,000 ✓	X		Present quarters are not sufficient.	Same.
	8#	Relocate Ammunition Assembly Building			X		75,000 ✓	X		Now in LCH area.	Recommended for inclusion in 1948 PW Budget by BuOrd (formerly #1, Station List).

DECLASSIFIED
 Authority: NPD 927631
 By: [Signature] Date: 10/20

FIFTH NAVAL DISTRICT
 FISCAL YEAR 1949 TO 1954, INCL.
 DATE OF SUBMITTAL 21 January 1947

Chincoteague, Va.

ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL	REQD		LUMP SUM	YD LAB		
9	9	Aircraft Parking Area	20,000 square yards	Concrete 8"-10"	X		Approved out of 47 \$120,000	X		Additional parking area necessary	Formerly #8, Year 4 Station List. Recommended by BuAer for construction out of '47 funds. Ltr N1-9(2)N1-15RS 256 dated 16 Jan 47.
10	10	Rocket Assembly Building and Loading Platform	Building 40'x70'x15' with 6" concrete deck. Parking and loading apron 6" concrete - 200'x55'. Locate at intersection of runways 16 and 10.		X		Approved out of 47 money 49,000	X		To be used for assembling and loading aircraft rockets.	Formerly #7, Year 3, Station List. Recommended by BuAer for construction out of '47 funds. BuAer ltr AER-SE-22N12/NA111 Ser 0381 dated 16 Jan 47.
11	11	Battery Shop	45'x25'		X		10,000 ✓ 5,150	X		Battery testing and maintenance NAOTS shop equipment.	As requested in NAOTS ltr S81-1(ON-6)(MR:fp) Ser 630 dated 25 Sept 46.
12	12	Addition to Sick Bay	New wing and minor modifications.		X		50,000 ✓ 40,000	X		In-patient department and gynecologic and pediatric facilities needed.	See NAAS-NAOTS/N1-9(2)/N9-3(ON6:JN:hn) serial 1032 dtd 19 Sept 1946.
	13	Gymnasium at St. Julien's Creek	Released to surplus - Old project for gym reinstated		X		92,000 200,000 ✓	X		All spaces, with exception of barber shop, in present gym are crowded. Gymn floor large enough for only basketball court with no room for spectators.	See NAOTS/L11-3(ON6:HS:rh). Serial 911 dtd 18 Dec 1946. Formerly #3, Year 3, Station List.
	14	Telephones for Housing	Switchboard adequate to handle increase, but 2 trunk lines will be needed.		X		9,000	X		Present facilities inadequate to meet demands made by additional housing.	See N1-9(2)/NAOTS/N28(ON6:JN:hn) serial 1007 dtd 17 Sept 1946.

Already approved by CNO for installation by sta. main's funds

DECLASSIFIED
 Authority: NND 927631
 Date: 10/20

FIFTH NAVAL DISTRICT											
FIVE - YEAR PROGRAM FISCAL YEAR 1949 TO 1954, INCL.											
ACTIVITY NAAS - NAOTS LOCATION Chincoteague, Va.											
ITEM NO	PRIORITY WITHIN YR.	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL.	REQD.		LUMP SUM	YD LAB		
15	15	Catapult		HE-1 Cata- pult and M-30 Launch- ing Plat- form.	X		\$14,000	X		Needed for drone launch- ing.	See NAAS ltr NI-9(2)/ 383-2(ON-9:LDR:mpc) seri- al 86 dtd 22 Jan 1947.
16	16	Ground Controlled Approach			X			X			
17	17*	Electrical Distri- bution System	Five changes in the present system.		X		20,000	X			See NAOTS ltr NI-9(2)/ 367/A4-3(JRG:rh) serial 2823 dtd 27 Nov 1946.
18	18*	38 Civilian Quarters			X		11,000 ✓	X			See NAAS-NAOTS ltr NI- 9(2)/N26-5(ON-9:LDR:bj) serial 1108 dtd 12 Dec 1946.
19	19*	20 Married Officers Quarters (10 BuOrd- 10BuAer)			X (See#2)		\$513,000 ✓ 477,000	X		Necessary to continued safe operation. Consoer Townsend and Associates recommend in report.	See ltr of transmit- tal.
20	20*	45 Married Enlisted Men's Quarters (20 BuOrd-25BuAer)			X (See#2)		\$160,000 ✓ 240,000	X		Due to isolated location, personnel need housing facilities for families.	See ltr of transmit- tal.
21	21*	Storm Drainage			X (See#2)		\$170,000 ✓ 405,000	X		Due to isolated location, personnel need housing facilities for families.	See ltr of transmit- tal.
22	22*	Public Works Build- ing	Two story, 36'x80'		X		125,000 ✓	X		Due to isolated location, personnel need housing facilities for families.	See ltr of transmit- tal.
23	23*	Public Works Shops & Storage	Plumbing, electrical, glass and carpentry, me- tal, paint, and uphol- stery shops in Public Works area.		X		50,000 ✓ 200,000 ✓	X		Inadequate drainage now causing severe erosion.	Formerly #5, Year 1, Station List.
					X			X		Present building tem- porary and space inade- quate.	Formerly #10, Year 2, Station List.
					X			X		Present shops are wood- en and temporary. Are scattered over a wide area.	Formerly #11, Year 2, Station List.

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FIFTH NAVAL DISTRICT											
FIVE - YEAR PROGRAM FISCAL YEAR 1949 TO 1954, INCL.											
ACTIVITY NAAS - NAOTS LOCATION Chincoteague, Va. DATE OF SUBMITTAL 21 January 1947											
ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL.	REQD.		LUMP SUM	YD LAB.		
FIRST YEAR (CONTINUED)											
24	24*	Boathouse and Dock	Crash and range facilities for 25 craft with shop and repair facilities.			10 acres	\$100,000	X		Present facilities on state land and make-shift. No adequate water or power supply. No adequate training facilities. No room for needed expansion.	Formerly #13, Year 1, Station List. Study not completed as to feasibility of installing on Navy property or necessity of land acquisition.
25	25	Hangar	Two story, 135' x 200', equipped with offices and shops. Similar to present P-10.		X		1,027,100	X		Maintenance and test work on drones require adequate hangar and test space.	Formerly #11, Year 4, Station List. See NAAS ltr N1-9(2)/N10-1(ONG: JN:hn)ser 2132 dated 29 Aug 46.
26	26*	Convert E-3 and E-4 to Barracks and Construct New BOQ			X		250,000	X		Available space inadequate for bachelor officers and enlisted men.	NAOTS barracks have been converted to officers housing. NAAS BOQ's are slated for enlisted barracks in order to get men out of wooden buildings and establish separate areas for officers and men.
27*	27*	Swimming Pool	50 meter pool with complete facilities.		X		324,000	X		No suitable swimming facilities closer than Ocean City, Md., 45 miles away.	Formerly #10, Year 4, Station List. See ltr N1-9(2)/N4-5(ON:bjj)ser 767 dated 20 Jun 46.
28	28	Torpedo Workshop	Combined storage and workshop for overhaul and assembly of torpedoes. Concrete deck and walls.		X		225,000	X		Torpedoes now on board and no facilities for storing, overhauling, or testing.	Formerly #15, Year 1, Station List.

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NAVAL DISTRICT
 FISCAL YEAR 1949 TO 1954, INCL.
 DATE OF SUBMITTAL 21 January 1947

ACTIVITY NAAS - NAOVS PROGRAM FISCAL YEAR 1949 TO 1954, INCL.

LOCATION Chincoteague, Va.

ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL.	REQD		LUMP SUM	YO. LAB.		
29	1*	School	75 to 100 students - 5 school rooms, office and toilets.		X		\$75,000 ✓	X		Children of officers, civilians and enlisted personnel require school facilities beyond capacity of communities adjacent to station. School authorities in surrounding communities say that their facilities are incapable of further expansion. The C.O. is unable to attract talented professional civilians needed for NAOVS unless school facilities exist.	Formerly #2, Year 2, Station List.
30	2*	Chapel	200 seating capacity for 3 denominations		X		125,000 ✓	X		Present religious services conducted in recreational building. Increased personnel will demand facilities in excess of this. Nearest community providing churches is 5 miles away.	Formerly #1, Year 2, Station List.
31	3*	Photographic Laboratory	50'x100'		X		120,000 ✓	X		Facilities now located in hangars taking up office space and providing meager services. Increased activity by NAOVS and by Fleet activities make demands in excess of capacity of equipment.	Formerly #9, Year 2, Station List.

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FIFTH NAVAL DISTRICT

FIVE - YEAR PROGRAM FISCAL YEAR 1949 TO 1954, INCL.
 ACTIVITY NAAS - NACTS LOCATION *Chincoteague, Va.* DATE OF SUBMITTAL 21 January 1947

ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL	REQD		LUMP SUM	YD LAB		
32	4	Radio Transmitter Building	30'x60' - one story	Brick	X		\$35,000	X		Facilities are housed in three makeshift wooden buildings requiring constant maintenance.	Formerly #4, Year 3, Station List.
33	5*	Addition to Boiler House	Three 265 HP steam boilers		X		75,000 ✓	X		Additional capacity required to heat additional spaces including twelve 40'x100' quonsets and other buildings.	Formerly #8, Year 1, Station List.
34	6*	Supply Open Storage	80,000 open storage, fenced, black topped.		X		27,000 ✓	X		Present outside storage has no security and is non-existent other than on open ground, which is constantly muddy.	Formerly #9, Year 2, Station List.
35	7*	Parking Lot	160,000 sq. ft. black topped - new road 20'x400'		X		53,000 ✓	X		Parking facilities for personnel who drive to work are meager, resulting in a large control problem. Many drivers find it necessary to park in the Public Works transportation compound, an undesirable feature.	
	8#	Magazines, Twelve Reinforced Concrete Steel Magazines	25'x28' - 12 reinforced steel magazines - constructed sub-surface.				240,000 ✓	X		At present there are 6 20'x50' temporary magazines. They are not constructed in accordance with OP-5.	Formerly #2, Year 3 Station List.

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FIFTH NAVAL DISTRICT

FIVE-YEAR PROGRAM FISCAL YEAR 1949 TO 1954, INCL.
 LOCATION Chincoteague, Va.

DATE OF SUBMITTAL 21 January 1947

ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL	REQD		LUMP SUM	YD LAB		
SECOND YEAR (CONTINUED)											
37	9*	Incinerator	2,000 to 2,500	persons	X		\$20,000 ✓	X		No incinerators exist on station. Garbage disposed of by contract, trash disposed on the dump, which system has not proven satisfactory.	Formerly #5, Year 4, Station List.
38	10*	Air Conditioning	Air condition building F-6, present administrative building, and bldg. B-31 Supply and Fiscal Bldg. Provide individual units for hangar offices.		X		66,000 ✓	X		Temperature of surrounding area during summer months is very hot and humid. Air conditioning required for health and comfort as well as increased efficiency.	
THIRD YEAR											
39	1*	Officers' Club, including 4 Tennis Courts & Swimming Pool	Club - 50' x 100' Swimming Pool - 40' x 125' 4 Tennis Courts		X		180,000 ✓	X		No large communities readily accessible, which can provide recreation.	Formerly #3, Year 2, Station List.
40	2*	Garage	10 stalls, painting room, spare parts room, 2 toilets & office.		X		55,000 ✓	X		Present garage wooden building with 6 stalls, inadequate office space, spare parts storage. Maintenance and repair of vehicles retarded by inadequate facilities.	Formerly #5, Year 2, Station List.
	3	Parachute Loft	35' x 50' with 35' tower	Brick	X		40,000	X		Present loft shares space with aviation stores issue section. Space inadequate & requires expansion of hanging and drying tower. Air conditioning poor. Aviation Stores issue section coincident with establishment of independent supply & accounting departments requires space allocated to present loft.	Formerly #6, Year 2, Station List.

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FIFTH NAVAL DISTRICT
 FIVE - YEAR PROGRAM FISCAL YEAR 1949 TO 1954, INCL.

ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA SIZE TYPE	LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		DATE OF SUBMITTAL 21 January 1947	BRIEF JUSTIFICATION	REMARKS
				AVAIL	REQD		LUMPSUM	YD LAB			
THIRD YEAR (CONTINUED)											
42	4*	Commissary Store	100'x38' one-story to include storage space.		X	\$60,000✓		X		Needed to provide family food.	Formerly #17, Year 1, Station List.
43	5*	Post Office	25'x50' one-story		X	25,000✓		X		Present post office space inadequate.	Formerly #3, Year 5, Station List.
44	6*	CPO Club	Accommodate 112 Chief Petty Officers	Chief	X	30,000✓		X		Present CPO Club located in industrial area in temporary building & is too small. Morale problem induced by isolated location of Command warrants provision of new and adequate building.	Formerly #14, Year 1, Station List.
45	7*	Sidewalks <i>Recomm. by sta. memb.</i>	9000'	Concrete	X	20,000✓		X		To be laid adjacent to existing roads.	Formerly #10, Year 3, Station List.
46	8#	Causeway to Wallops Island			See Item 1, Year 1.	1,600,000✓		X		To provide ready access to NACTS range. NACA has indicated willingness to share cost.	Formerly #9, Year 3, Station List.
47	9*	Water Storage Tanks	5 concrete water tanks. 300,000 gals. each		X	225,000✓		X		To improve water supply.	Formerly #5, Year 3, Station List.
48	10#	Ordnance Equipment	20'x30' one story		X	20,000✓		X		No adequate storage for fork lifts, etc.	Formerly #14, Year 4, Station List.
FOURTH YEAR											
49	1	Extension on Tower	One story - 1300 square feet, 4 rooms		X	20,000		X		To provide additional needed office space in tower.	Formerly #3, Year 4, Station List.
50	2#	Access Roads to Magazines	3000' concrete road, 20' wide		X	30,000✓		X		Needed for access to magazines.	Formerly #1, Year 3, Station List.

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FIFTH NAVAL DISTRICT
 FIVE-YEAR PROGRAM FISCAL YEAR 1949 TO 1954, INCL.
 ACTIVITY NAAS - NAOTS LOCATION Chincoteague, Va. DATE OF SUBMITTAL 21 January 1947

ITEM NO	PRIORITY WITHIN YR	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL	REQD		LUMP SUM	YD LAB		
FOURTH YEAR (CONTINUED)											
51	3	Crash Truck Storage	Adequate cold weather and rain coverage for crash equipment.		X		\$10,000	X		Present storage facilities inadequate.	Formerly #13, Year 2, Station List.
52	4	Hangar	100'x150' permanent small hangar for station planes		X		300,000	X		Present structure temporary.	Formerly #11, Year 4, Station List.
53	5*	Dry & Cold Storage	5,000 sq. ft. of dry provision storage - 2,000 cu. ft. meat storage and 400 cu. ft. vegetable and dairy storage.		X		67,000 ✓	X		Present space is scattered and inadequate. 15 days of dry storage, 7 to 10 days meat storage now available necessitating many truck trips to Norfolk.	Formerly #6 and #7, Year 4, Station List.
FIFTH YEAR											
54	1*	Bridge Across Mosquito Creek	North of approach zone to runway #18. Bridge to span creek.		X		110,000 ✓	X		Provide access to the Station from northern routes.	Formerly #5, Year 5, Station List.
55	2*	Improve Dirt Roads	Connect bridge above highway proceeding from Wattsville, Va. to Ocean City, Md. via Snow Hill, Md. and Berlin, Md. One mile road, concrete - 20' wide.			100 acres	70,000 ✓	X		Access to the north	Formerly #6, Year 5, Station List.
	3*	Perimeter Road	7,000' concrete road 20' wide.		X		70,000 ✓	X		Provide access to remote portions of station and enhance security on the northern side.	Formerly #1, Year 5, Station List.
	4*	Steam Lines	6,000' steam line now above ground.				150,000 ✓	X		Improve sightlines station.	Formerly #7, Year 5, Station List.
	5*	Station Power Plant	Remove and install electric power plant for electric heating with individual heating units on buildings.				000 ✓	X		Reduce dependency on public utilities now rented to the Navy, and thereby reduce demands on already heavily-loaded power supply.	Formerly #7, Year 5, Station List.

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FIFTH NAVAL DISTRICT

NAAS - NAOTS

PROGRAM FISCAL YEAR 1949 TO 1954, INCL.

LOCATION Chincoteague, Va.

DATE OF SUBMITTAL 21 January 1947

ITEM NO	PRIORITY WITHIN YR.	PROJECT	DESCRIPTIVE DATA		LAND		TOTAL ESTIMATE	METHOD OF ACCOMP.		BRIEF JUSTIFICATION	REMARKS
			SIZE	TYPE	AVAIL.	REQD.		LUMP SUM	YD LAB.		
59	8*	Railroad Spur	Approximately 7 miles right of way	miles	X		\$500,000✓	X		Needed to improve existing supply communications. Present set-up requires unloading under unfavorable conditions.	
60	7*	Ammunition Belting Rooms	2 belting rooms, 18'x25'		X		10,000✓	X		Facilities consist of 2 Quonset Huts, with wooden decks, which space is inadequate and constantly in need of maintenance. Mission of station requires supporting of 1 CVB group, or equivalent. Belting facilities adjacent to fleet aircraft parking area required to perform this mission.	Formerly #4, Year 5, Station List.
61	8*	Overhaul Telephone System	800 phones		X		200,730✓	X		Revise telephone system. Place lines underground, and install dial system. Present system overloaded and inadequate.	
	9*	Golf Course	9 holes		X		300,000✓	X		Located in approach zone to runway 10-28. Required for morale purposes of officers, enlisted men, and civilians quartered on board, due to isolated location of station.	Formerly #2, Year 5, Station List.
63	10*	Dispensary	Two story building 120'x 36'		X		120,000✓	X		Provide facilities, for hospitalization of personnel, including dependents. Present building is temporary and is capable of only limited expansion or alteration.	Formerly #1, Year 1, Station List.

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