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FINAL REPORT

ON

TEST OF RADAR RANGE FINDER IN B-25G AIRPLANE

No. 28680413.682

DATE: 25 OCTOBER 1943

Classification cancelled
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COMMANDER, APG COMMAND
AUTH DTD 1 July 51
By HARRY S. TYREE
Signature and Grade
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PROOF DEPARTMENT
ARMY AIR FORCES PROVING GROUND COMMAND
EGLIN FIELD, FLORIDA

FINAL REPORT

ON

TEST OF RADAR RANGE FINDER IN B-25G AIRPLANE

Serial No.: 5-43-6 No. of Pages: 4 Date: 25 October 1943.

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1. OBJECT:

To determine the accuracy of fire of the 75mm airborne cannon using radar range.

2. INTRODUCTION:

This test was requested in a letter from the Commanding General, Army Air Forces Materiel Command, Wright Field, Dayton, Ohio, dated April 1, 1943, to the Commanding General, Army Air Forces Proving Ground Command, Eglin Field, Florida, subject: "Test of Radar Range Finder in B-25G Airplane." This test was begun 7 September 1943 and completed 11 October 1943.

a. Description. The SCR-726 (ARO) is a lightweight experimental radar set which provides continuous range on a calibrated range meter or if desired, in the form of a shaft rotation. In this particular installation range was read on a range meter only. It searches in range, locks-on, and automatically follows any target within the cone of the antenna ($\measuredangle$ 15°). The radar operator's position was beside the pilot's seat in the B-25G Airplane. The radar transmitter-receiver and range unit was installed in the nose of the B-25G airplane, directly behind the .50 caliber ammunition cans. The antenna was installed on the nose of the airplane.

3. CONCLUSION.--It is concluded that:

The SCR-726 (ARO) provided satisfactory range for firing the 75mm cannon up to a maximum range of three thousand (3,000) yards.

4. RECOMMENDATIONS.--It is recommended that:

a. The installation be so designed that the range information from the radar unit be used to drive the sight, independent of a radar operator.

b. Further tests be conducted to determine the feasibility of firing the 75mm cannon with radar range up to five thousand (5,000) yards.

5. RECORD OF TEST:

This test was run in accordance with the program

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attached, except the Range used was Range 50, instead of Range 54. A ship silhouette one hundred nineteen feet (119') wide by fifty-eight feet (58') high covered with target cloth and with a corner reflector installed on it, was used as a target.

8. DISCUSSION:

a. The test was conducted with a radar operator seated beside the pilot. The radar operator read range from the range meter and notified the pilot at the proper range for firing. The Wagner reflector type sight was used, boresight data for same being obtained from earlier tests conducted by Major John C. E. Williams. Three (3) rounds were fired on each pass at three thousand (3,000), two thousand five hundred (2,500), and two thousand (2,000) yards, respectively. The three thousand (3,000) yard shot in many cases was used to determine an aiming point from which the two thousand five hundred (2,500) and two thousand (2,000) yard shots could be corrected. The inclosed data would indicate that the average range given the gunner was short, causing most shots to go over. But, the aiming point was at least half-way up on the target which would indicate that proper range would cause the projectile to land beyond the target. Therefore, the mean point of impact should be, and is, over the target.

b. During the three (3) days of the test turbulent weather was experienced, making it very difficult for the pilot to hold the sight on the target. With the sight preset at a given range if the pilot is notified at the point of proper range and the sight is not on the target, a range error will be expected due to the time required to bring the sight back on the target. This error can be eliminated if the installation is made as suggested in RECOMMENDATIONS, paragraph a.

c. All results are Range Officer's estimates since it was impossible to triangulate on the target used. (It was not possible for the range officer to give azimuth errors.) Where direct hits are indicated, it was assumed that any projectile landing within three hundred (300) feet beyond the target would be a hit. The approaches were made in many cases in excess of five thousand (5,000) yards and the radar range unit would lock on at its maximum range indication (5,000 yards). Therefore, it is recommended that further tests be

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conducted firing at ranges up to five thousand (5,000) yards using radar range.

7. ENCLOSURES:

Inclosure 1 - Test Program.
Inclosure 2 - Summary of Results.
Inclosure 3 - Photographs of the Installation.

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SUMMARY OF RESULTS

	Range(Yds)	Point of Impact*	M.P.I.	% Hits	Total Hits (%)
Pilot No. 1	3,000	672	219	26	
	2,500	247	93	63	54
	2,000	116	101	82	
Pilot No. 2	3,000	779	697	20	
	2,500	609	588	50	34
	2,000	477	447	37	
Pilot No. 3	3,000	442	330	42	
	2,500	334	325	58	58
	2,000	179	178	83	

*Point of impact is the average distance (feet) beyond the target that the projectile hit the water.

NOTE: If aiming point is 30 feet up on target the average point of impact should be approximately 300 to 350 feet beyond the target.

Inclosure 2.

[redacted]