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FR-1215

NAVY DEPARTMENT
BUREAU OF ENGINEERING

Report of

Test on Sirens, Motor Operated
Manufactured and Submitted by
Clark Cooper Company.

NAVAL RESEARCH LABORATORY
ANACOSTIA STATION
WASHINGTON, D.C.

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Authorization: BuEng. ltr. S65-4/L5 (8-21-Ds) of 4 Sept. 1935.
Date of Test: October-November, 1935.

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AUTHORIZATION FOR TEST

1. This test was authorized by reference (a) and other references pertinent to this problem are listed as references (b), (c), (d), (e) and (f).

Reference: (a) BuEng.ltr. S65-4/L5(8-21-Ds) of 4 Sept.1935.
(b) Navy Dept.Specifications 17S11a of 1 Apr. 1931.
(c) I.C. Division Test Report No.530 of 11 Sept.1933.
(d) I.C. Division Test Report No.530-A of 6 Feb.1934.
(e) I.C. Division Test Report No.554 of 21 May 1934.
(f) Bu.Eng.ltr. S65-4/L5(11-28-DF) of 11 Jan.1935
to Clark Cooper Co.

OBJECT OF TEST

2. The object of this test was to determine the suitability of these sirens for the Naval service and their conformance with specifications, reference (b).

ABSTRACT OF TEST

3. Each siren was set up at this Laboratory in test circuits and carefully observed while under test for conformance with specifications, reference (b). The usual inspection of the sirens as to materials, design and workmanship concluded the test.

CONCLUSIONS

(a) These sirens, manufactured and submitted by the Clark Cooper Company, Philadelphia, Pa., satisfactorily complied with the major requirements of the specifications, ref. (b), but do not include all the features outlined under Bureau's letters to manufacturer, ref. (f).

(b) If modified, to embody changes in accordance with "Comments" covered by this report, the sirens would meet the requirements of the specifications, except that requiring a minimum frequency of 1500 CPS for Type S25. However, comments, paragraphs 24, 25, 27, 28, and 29, cover defects which, it is suggested, should be considered under the provisions of paragraph (c) of ref.(b).

(c) The Bureau's attention is invited to the fact that the Type S50 siren has been tested on two occasions prior to this test and was reported under refs. (c) and (d). Type S25 was also previously tested and reported under reference (e).

RECOMMENDATION

(a) In the event the Bureau approves of the use of roller bearings for Type S50 siren and sleeve bearings for S25, it is recommended that approval be held in abeyance until the manufacturer makes the changes considered necessary by the Bureau and submits samples for examination to determine compliance and quality of workmanship.

DESCRIPTION OF MATERIAL UNDER TEST

4. The sirens, submitted by the Clark Cooper Company, are known as Types S50 and S25. They are motor driven, series wound, and operate from either alternating or direct currents at a potential of 115 volts.

5. The motor is housed in an aluminum alloy splashproof case, having four (4) mounting lugs and a terminal box cast integral with the case. Two bosses, tapped for 3/4" Navy terminal tubes, are located on the terminal box.

6. The motor is supported by an aluminum alloy casting which also forms the rotor housing of the siren. This casting is secured to the case with four (4) flat head cadmium plated steel machine screws and nuts.

7. Located between the case and the rotor housing is a flat rubber gasket to insure watertightness.

8. Roller bearings are provided for the type S50 siren and the bearing nearest the rotor is oiled from the outside by removing one of the three (3) headless brass machine screws, tapped into the rotor housing. The lower bearing can be reached only by the removal of the motor from its case.

9. Sleeve bearings are provided for the type S25 siren and it is necessary to remove the motor from its case in order to lubricate either bearing.

10. Located in grooves around the periphery of the rotor housing, are steel wires for protection against injury. A removable cast aluminum alloy cover is also provided.

11. Located on the rotor, is a threaded split steel bushing and nut for securing the rotor to the armature shaft.

12. The armature and field cores of the motor are constructed of laminated material.

13. Located in the terminal box is a terminal block for making the necessary connections.

14. For further details of construction, see plates 1 and 2 for Type S50, and plates 3 and 4 for Type S25.

METHOD OF TEST

15. The sirens as received were first tested for endurance by locating them in a compartment, having an ambient temperature of 40°C. and operating them one minute every alternate minute for a period of 48 hours. During this test the temperature rises and current consumption of the motors were measured.

16. Following this each siren was tested for operation when inclined 30° from the vertical, in all planes, while supplied with 10% over voltage (126.5 volts) and 20% under voltage (92.5 volts).

<u>Requirements</u>	<u>Test Values</u>	
	<u>Type S50</u>	<u>Type S25</u>
Insulation resistance: Shall not be less than 5 megohms.	200 megohms by 1000 volt megger before dielectric test.	200 megohms by 1000 volt megger before dielectric test.
Dielectric Test: Shall withstand 1240 V. a.c., 60 cycles, applied between all current carrying parts to case, for a period of one minute, without breakdowns occurring.	Satisfactory as specified.	Satisfactory as specified.
Watertightness: No leaks shall occur when splashed with 1" stream of water, 35 foot head, from a distance of 10 feet, for a period of 5 minutes.	Satisfactory as specified.	Satisfactory as specified.
Shock integrity: Shall withstand 20 blows of 250 foot pounds without damage to siren.	Satisfactory as specified.	Satisfactory as specified.
Audibility range: Not less than 1500 yards.	2000 yards	1800 yards
Case material: Aluminum alloy.	Aluminum alloy	Aluminum alloy
Inside finish of case: Two coats of an approved aluminum paint, followed by one coat of insulating varnish.	Satisfactory as specified.	Satisfactory as specified.
Terminal lugs: Shall be in accordance with BuEng.Drwg. 9-S-1841-L.	*Unsatisfactory See "Comments" par. 23.	*Unsatisfactory See "Comments" par. 23.
Mounting lugs: Four lugs, spaced not more than 4 inches.	Four lugs, spaced 3-1/2"	Four lugs, spaced 3-1/2"
Weight: Not specified.	10 lb. 2 oz.	8 lb. 4 oz.
Dimensions: Not specified	Height - 8"75 Max.Dia. 7"00	7"25 Max.Dia. 6"25

*Denotes failure to comply with specifications.

22. Direct Current Characteristics at a Potential of 115 volts.

	<u>Type S50</u>	<u>Type S25</u>
Amperes	4.10 amps	2.0 amps.
Watts	471.5 watts	230.0 watts
Pitch of note	2150 CPS	*1150 CPS

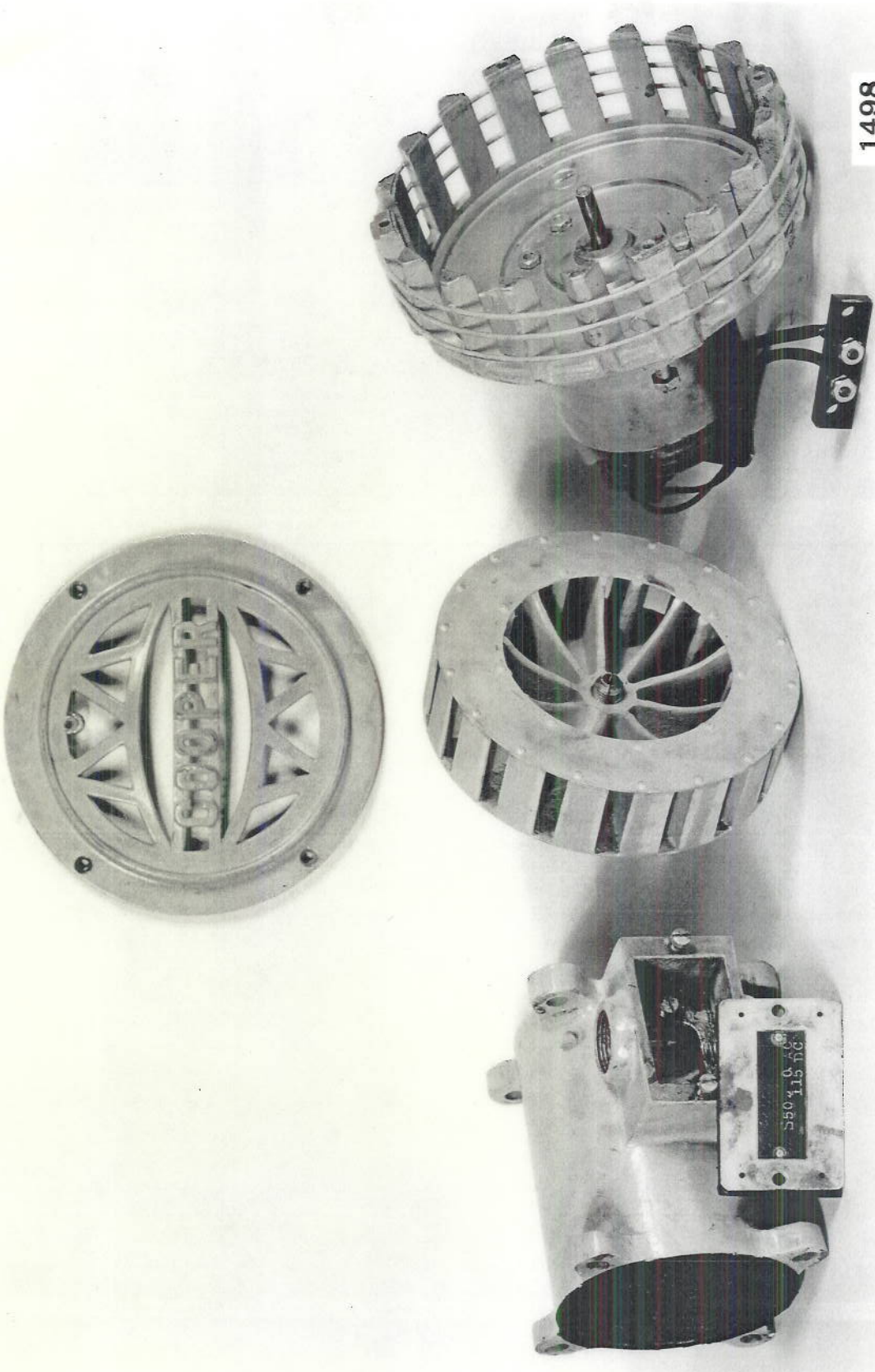
*Denotes failure to comply with specifications.

34. If modified to embody changes in accordance with "Comments" covered by this report the sirens would meet the requirements of the specifications, except that requiring a minimum frequency of 1500 CPS for Type S25. However, comments, paragraphs 24, 25, 27, 28 and 29 cover defects which, it is suggested, should be considered under the provisions of paragraph (c) of ref. (b).

35. The Bureau's attention is invited to the fact that the Type S50 siren has been tested on two occasions prior to this test and was reported under refs. (c) and (d). Type S25 was also previously tested and reported under ref. (e).

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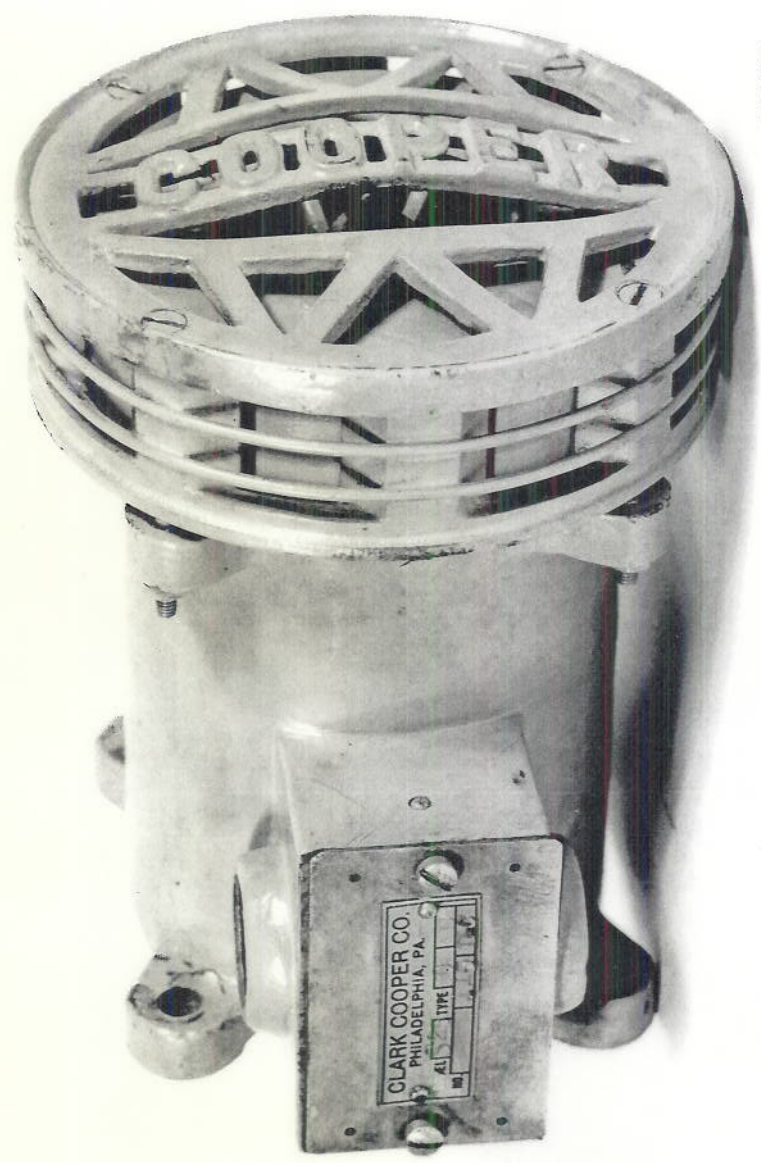




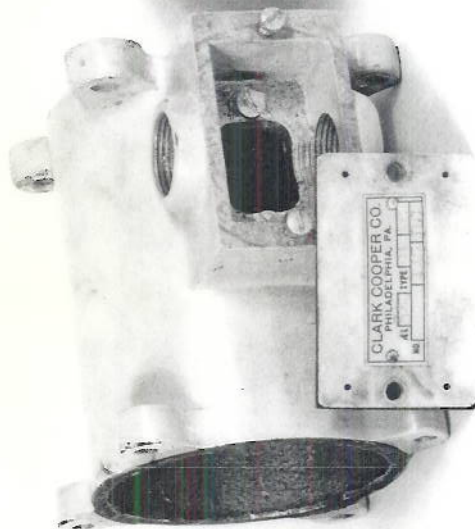
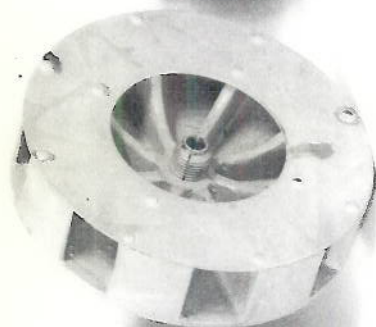
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PLATE 2



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