

REPORT NO. FR-1529-A

DATE 25 September 1940

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REPORT

Report of Test

on

Morris Type H-2

by

F. H. Danlap

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SAVANNAH POLYGRAPH LABORATORY

SAVANNAH, G. A.

25 September 1940

NRL Report No. B-1529 A

NAVY DEPARTMENT

Report of Test

on

Horn, Type H-2

Submitted by

Navy Yard, Portsmouth, New Hampshire

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Authorization: BuShips ltr. S65-4(8-9-DYs) of 5 September
1940.

Date of Test: September, 1940.

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AUTHORIZATION FOR TEST

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

Reference: (a) BuShips Ltr. S65-4(8-9-DYs) of 5 September 1940.
(b) Specifications 17S11c of 1 May 1940.
(c) Portsmouth Plan 30247 - Bu.File No. 11-T-1321-L-Alt 5.
(d) NRL Report No. B-1529 of 20 April 1939.

OBJECT OF TEST

2. The object of this test was to determine conformance of the sample horn with the specifications, reference (b), and its suitability for Naval use.

ABSTRACT OF TEST

3. The sample horn was set up at this Laboratory in suitable test circuits where its performance was carefully observed for compliance with the requirements of the specifications. An inspection of the sample to determine compliance in the matter of materials, design, and workmanship, concluded the test.

Conclusions

(a) The subject horn, manufactured by Portsmouth Navy Yard as a type H-2 (115 V.A.C.), fully complied with the specifications, reference (b). However, a cement having a higher melting point should be used in the counter-bored holes in the insulating bases (pcs. 10 and 22). This cement melted out during the endurance test at 60°C. ambient temperature.

Recommendations

(a) It is recommended that the subject horn be approved for Naval use, subject to the use of a cement having a higher melting point.

DESCRIPTION OF MATERIAL UNDER TEST

4. The sample horn, submitted as a Navy type H-2, is of the vibrating type, employs no contacts, and is designed to operate from a supply of 115 volts, a.c., 60 cycles.

5. The noise is produced by a steel button, riveted to the under side of the flat steel armature, striking the nickel-chromium-iron alloy diaphragm.

6. The case of cast aluminum alloy is provided with two (2) bosses, one tapped for a 3/4-inch (IPS) standard Navy terminal tube, and two (2) mounting lugs cast integral with the case.

7. Further details are shown by photographs, Plates 2 and 3, and drawing, reference (c).

METHOD OF TEST

8. The sample horn, following tests to determine its electrical and acoustical characteristics at rated voltage and frequency, was subjected to further tests in the following order:

- (a) Inclination.
- (b) Endurance and temperature rise.
- (c) Acoustical analysis following the endurance test.
- (d) Shock test.
- (e) Vibration test.
- (f) Dielectric test.
- (g) Insulation resistance.
- (h) Watertight test.

9. The tests were concluded with a careful examination of the sample to determine compliance with the specifications, pertaining to design, quality of workmanship, and materials, and any defects resulting from the tests.

RESULTS OF TEST

10. The test results obtained were as follows:

<u>Requirement</u>	<u>Test Values</u>
Voltage: 115 volts.	115 volts.
Current: A.C., 60 cycles.	A.C., 60 cycles.

<u>Requirements</u>	<u>Test Values</u>
Amperes: Not specified.	0.203 amperes.
Watts: Shall not exceed 25.	12.6 watts.
Power factor: Not specified.	54 per cent.
Weight: Shall not exceed 6 pounds.	Complied, 4 pounds, 5 ounces.
Sound pressure output: Shall be not less than 75 decibels at 18 feet in a soundproof room under the following conditions:	
(a) Before the endurance test	Complied, 80 db.
(b) Following the endurance test	Complied, 83 db.
Pitch of note: Nonresonated.	Complied. (See Plate 1)
Inclination: Shall operate in any position when supplied with rated voltage and frequency \pm 10 per cent.	Complied.
Endurance test: Shall operate 1500 cycles of "one minute on" and "one minute off," the first 750 cycles at 60°C. and the second at 0°C. ambient temperatures.	Complied.
Temperature: Maximum temperature shall not exceed 115°C. during the endurance test. (55°C. rise at 60°C.)	Complied, 37.6°C. above 60°C. ambient.
Shock integrity: Shall withstand 20 shocks of 250 foot pounds each as specified in paragraph F-2g.	Complied.
Vibration test: Shall be mounted on a standard Navy 3 foot pound vibration machine and subjected to six tests of 30 minutes at 100, 150, 200, 250, 300, and 350 shocks per minute.	Complied.

Requirements

Test Values

Dielectric test: Shall withstand twice the rated voltage plus 1250 volts, 60 cycles, for one minute between electrical circuit and ground.

Complied.

Insulation resistance: Shall be not less than 5 megohms at not less than 500 volts, d.c.

Complied, 200 megohms by 1000 volt Megger.

Watertight integrity: Shall be submerged under 3 feet of standard sea water for 3 hours without the entry of water into the case.

Complied.

Nameplate: Shall be in accordance with N.D. Specification 42 N 2.

Complied. Laminated phenolic material.

Diaphragm: Shall be of nickel-chromium alloy unless otherwise specifically approved by the bureau concerned.

Complied. Nickel-chromium alloy.

Terminal block: Shall be of phenolic material equipped with 9-S-1841-L terminals.

Complied.

Coil windings: Shall be of single or double silk or cotton covered enameled copper wire.

Complied. Single silk enameled copper wire.

NOTE: The salt spray test was not conducted due to previous satisfactory test reported by reference (d).

CONCLUSIONS

11. The subject horn, manufactured by Portsmouth Navy Yard as a type H-2 (115 V.A.C.), fully complied with the specifications, reference (b). However, a cement having a higher melting point should be used in the counter-bored holes in the insulating bases (pcs. 10 and 22). This cement melted out during the endurance test at 60°C. ambient temperature.

PORTSMOUTH NAVY YARD
TYPE H-2 HORN
BEFORE ENDURANCE TEST
22 AUGUST 1940



BEFORE ENDURANCE TEST



AFTER ENDURANCE TEST



AFTER ENDURANCE TEST

PLATE

PORTSMOUTH HAYY
TYPE H-2 HOPII
BEFORE ENDURANCE
22 AUGUST 1940

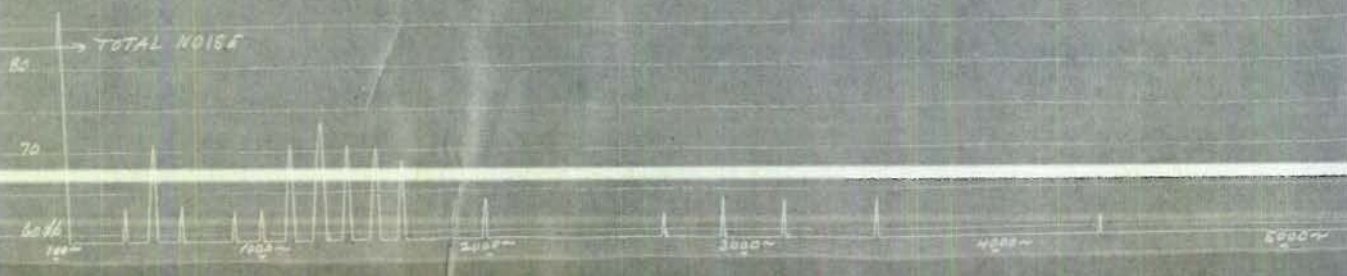




Plate 2

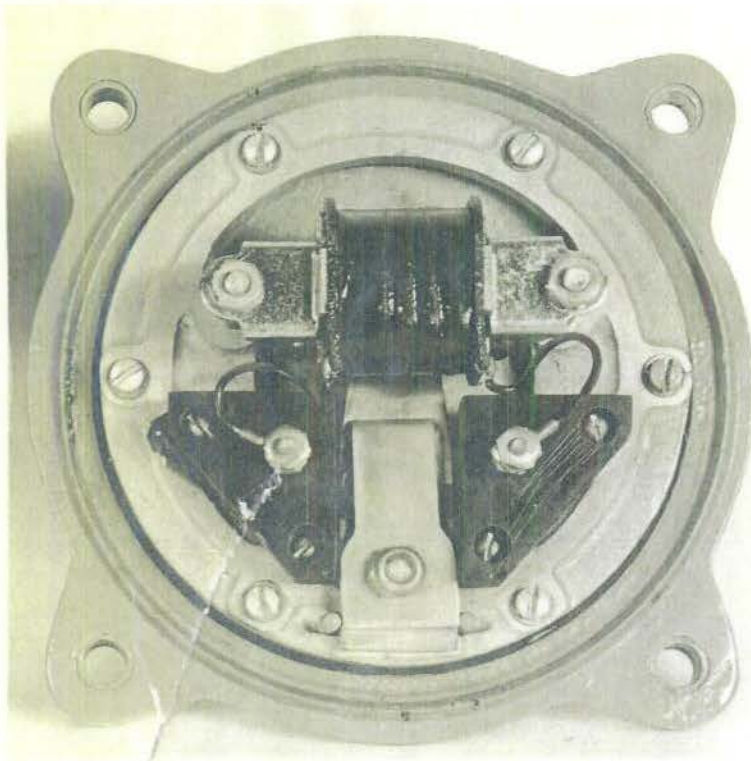


Plate 3