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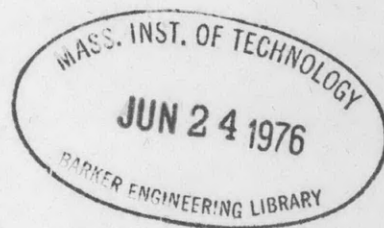
THE EFFECTIVE HORSEPOWER OF THE TYPE 4 (RADAR)
PERISCOPE REDUCED HEAD SECTION

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by

A. Hoyt



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Report C-188

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Introduction

Tests to determine the power requirements and lateral vibration characteristics of a Type 4 (radar) periscope reduced-head section were requested (1)* by the Bureau of Ships. The David Taylor Model Basin was provided with the full-scale periscope section by the Bureau of Ships. A wooden model built to the same scale as the original periscope section was substituted in the test for convenience in handling and attachment to the towing dynamometer.

Vibration tests were not attempted due to the extreme impracticability of duplicating in a model test the mode and degree of periscope section support which is obtained on shipboard.

The purpose of this report is to present the effective horsepower obtained from the model tests.

Model and Test Apparatus

The dimensions of the full-scale model are shown in Figure 1. This figure also depicts the position of the model with reference to the water surface during the two tests and the method of attachment to the towing carriage for the totally submerged test.

Test Results

The total resistance figures obtained from these tests are given in Table 1 and the effective horsepowers are presented in Figure 2. The totally submerged test involved the use of a strut and transverse guys to prevent lateral vibration of the strut and the model. This arrangement requires a strut tare correction which may be subject to some error. The EHP curve for the totally submerged condition is, therefore, less reliable than that for the semi-submerged condition.

Conclusions and Recommendations

On shipboard this periscope head section will be mounted at the upper end of a long telescopic tube. With the ship under

* Numbers in parentheses indicate references on page 2.

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way and the tube extended even a few feet, lateral vibration will commence at a relatively slow ship speed and, consequently, the effective horsepower of the periscope section will not be the same as that indicated in Figure 2. To obtain a more realistic picture of the power requirements, tests with controlled lateral vibration are necessary.

References

- (1) BuShips ltr R-SS/S24-9(332-515) of 20 Feb 48.

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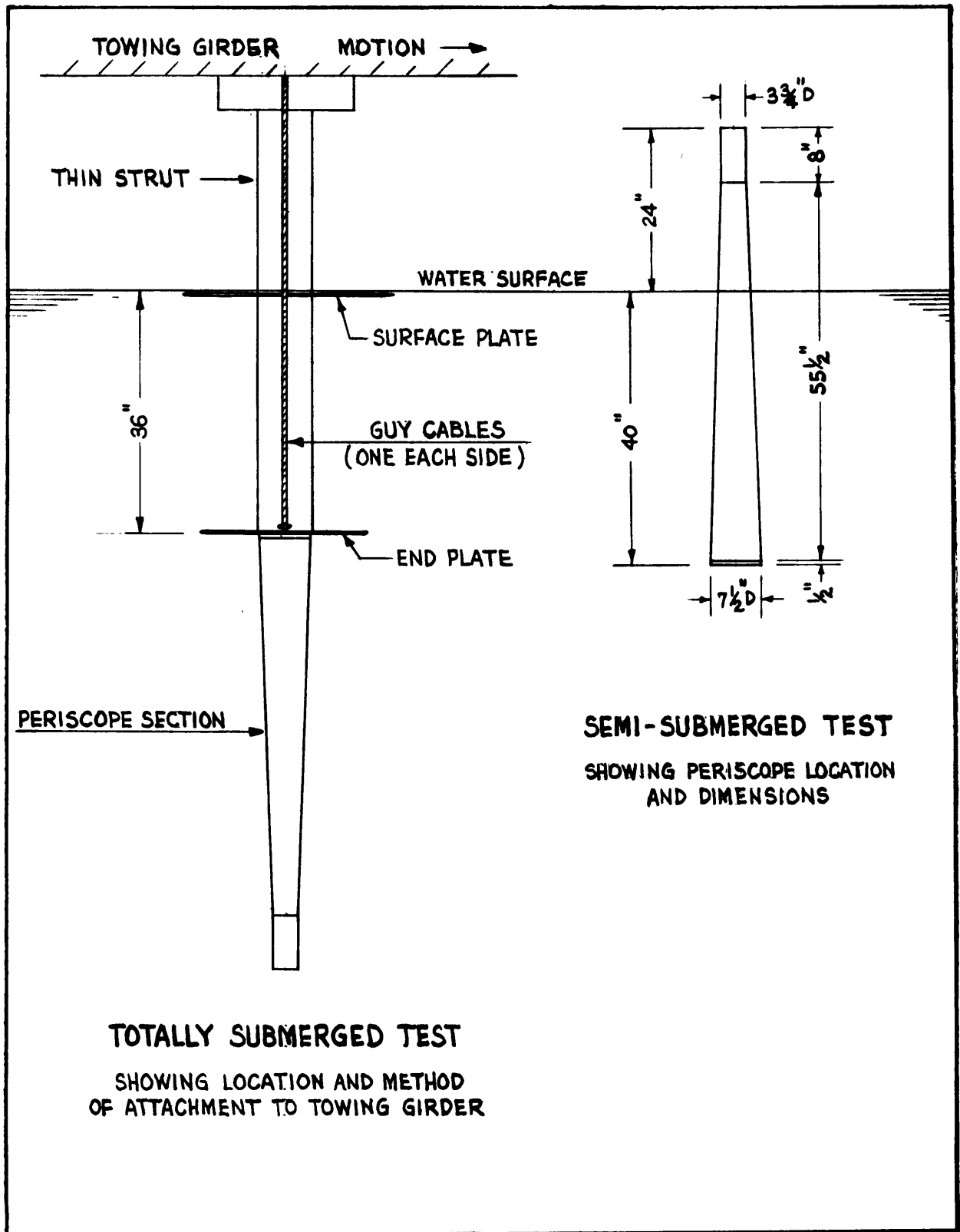


Figure 1 - Test arrangements for Periscope Section Model

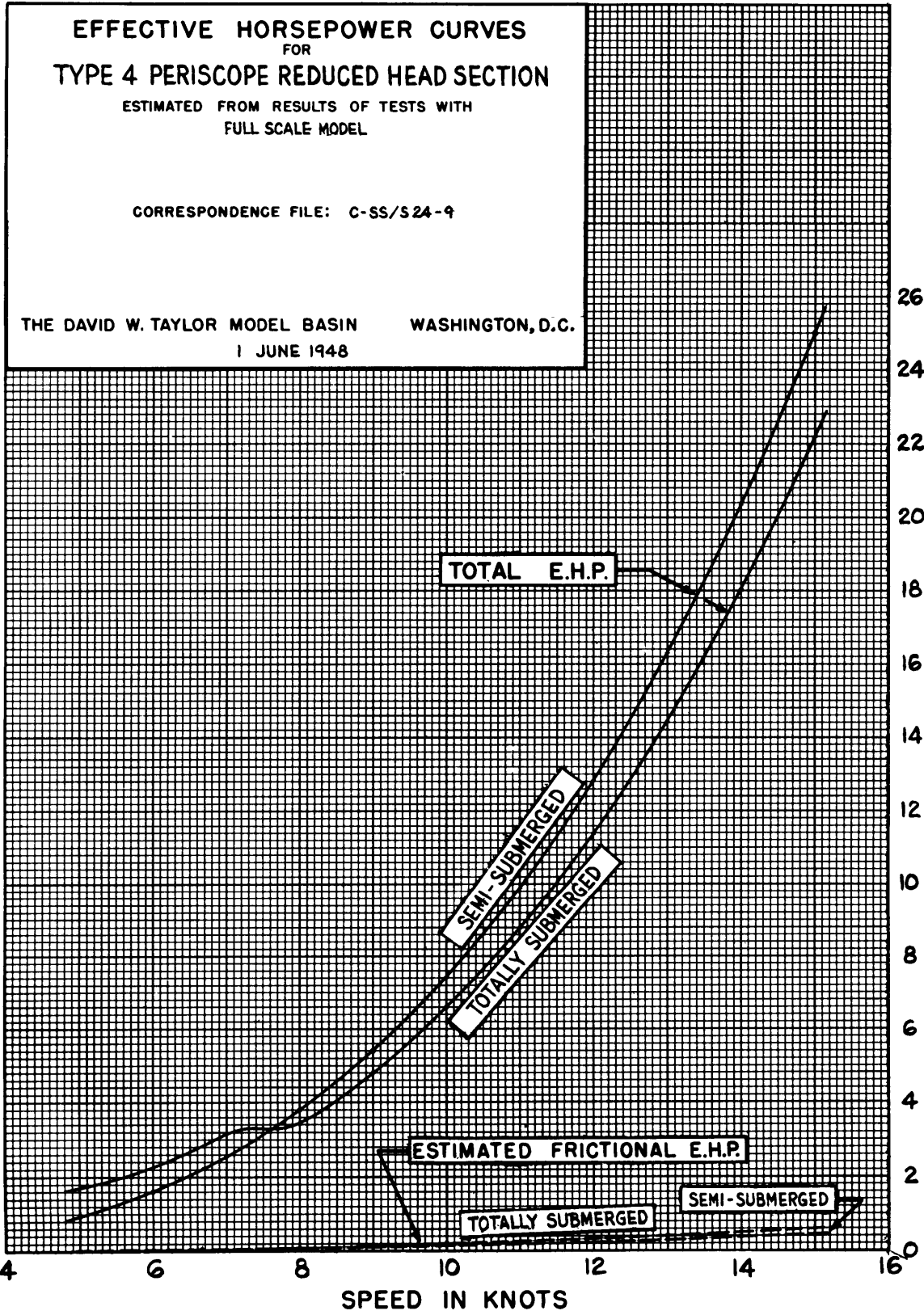


Figure 2

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TABLE 1

The Resistance of Type 4 (Radar) Periscope Reduced Head Section

<u>Ship Speed in Knots</u>	<u>Total Resistance in pounds in salt water at 50°F</u>	
	<u>Totally Submerged</u>	<u>Semi-Submerged</u>
5	111.5	60.6
6	121.9	87.2
7	147.1	118.6
8	139.7	154.8
9	173.9	195.8
10	214.6	241.7
11	259.4	292.3
12	308.6	347.7
13	362.1	408.1
14	419.7	473.1
15	495.0	542.8

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