

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE</u>
1. AUTHORIZATION FOR TEST.....	1
2. OBJECT OF TEST.....	1
3. ABSTRACT OF TEST.....	1
(a) Conclusion.....	1a
(b) Recommendation.....	1a
4. DESCRIPTION OF MATERIAL UNDER TEST.....	2
5. METHOD OF TEST.....	2
6. RESULTS OF TEST.....	3
7. COMMENTS ON RESULTS OF TEST.....	4
8. CONCLUSIONS	4

Appendix

Photograph of submitted transformer.....	Plate 1
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AUTHORIZATION FOR TEST

1. This test was authorized by reference (a), and another reference pertinent to this problem is listed as reference (b).

Reference: (a) Bueng.ltr. JJ-17T19(9-12-Ds) of
14 Sept. 1935.

(b) Navy Department Specifications
17T19b of 1 May 1935.

OBJECT OF TEST

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

ABSTRACT OF TEST

3. The subject transformer was set up at this laboratory and carefully checked for its conformance with specifications, reference (b). This test was concluded with the usual inspection of the transformer as to materials, design and workmanship.

CONCLUSIONS

(a) This transformer is of good workmanship and complied with the major requirements of the specifications, reference (b). If minor changes were made in accordance with "Comments" of this report, the subject material would be suitable for Naval use where a watertight case is not required.

RECOMMENDATION

(b) In view of its satisfactory performance under test, it is recommended that the transformer be approved for the Naval service, subject to "Comments" of this report.

METHOD OF TEST

1. The transformer was first tested for voltage regulation by comparing the secondary voltage at full load and no load, when a constant potential of 115 volts was applied to the primary.
2. The efficiency of the transformer at full rated load and normal primary voltage was next determined.
3. Following this, it was placed in a compartment having an ambient temperature of 40°C. (104°F.) and operated for 3 hours at full load while energized at 120 volts A.C., 60 cycles. This test also indicated whether the transformer was properly rated for continuous duty.
4. A short circuit test was then given by placing a short circuit across the secondary for a period of 15 seconds. During this test, the primary was energized at a potential of 120 volts, a.c., 60 cycles.
5. Prior to and following the dielectric tests, the insulation resistance between the windings and between the windings and the case was measured by a 1000 volt Megger.
6. The specified dielectric tests were next applied. This test also indicated whether any change in the insulation was observed during the temperature rise and short circuit tests.
7. The transformer was then partly disassembled and inspected for compliance with the specifications, relative to materials and workmanship.

RESULTS OF TESTS

<u>17. Requirements</u>	<u>Test Values</u>
Primary voltage: 115 volts	120 Volts (Nameplate rating).
Secondary voltage: Shall not exceed 20 volts with 115 volts impressed on the primary.	19.0 Volts (No load). 19.95 Volts (No load, 120 volt primary).
Frequency and Phase: 60 cycles, S.P.	60 cycles, S.P. (Nameplate rating).
Voltage regulation: With a constant primary voltage of 115 volts, the voltage on the secondary shall be 18 volts at full load, 100% P.F.	18 volts, at rated load (200 V.A., using a non-inductive resistance).
Efficiency: Shall not be less than 85% at rated load.	88.1% efficiency at rated load. (115 volts across primary.)
Temperature rise: Shall not exceed 50°C., at an ambient temperature of 40°C., at rated load.	Primary - 45.56°C. rise Secondary - 25.45°C. rise (Full load - 120 V. primary).
Rating: Shall be capable of operating continuously at 120 volts, primary voltage, without exceeding the allowable temperature rise of 50°C.	Operated for 3 hours, full load, 40°C. ambient. Temperature rises as given.
Short circuit test: Secondary shorted for 15 seconds without injury, with 120 volts impressed on the primary.	Shorted for 15 seconds with 120 volts impressed on the primary. (No apparent damage)
Insulation resistance: (Not specified.) Primary to core, Secondary to core, and between windings.	Before dielectric test, transformer heated as result of short circuit test - Average resistance, 3 megohms. After dielectric test, transformer cooled to room temperature, average resistance 200 megohms by 1000 V. Megger.
Dielectric Tests: Shall withstand 2500 V. a.c., 60 cycles, between primary and case, with secondary grounded to core and 1250 V. a.c., 60 cycles between secondary and core with primary grounded.	Tested as specified without breakdowns occurring.

Dimensions without case: Not specified.

Height - 5¹/₄"75
Width - 3¹/₂"625
Depth - 3¹/₄"375

Weight without case: Not specified.

8 lbs. 6 ozs.

COMMENTS ON RESULTS OF TEST

18. Under test, the transformer proved to be correctly rated at 120/20 volts (Test results 120/19.95 volts). The discrepancy between the specification requirement of 115/20 volts and the manufacturer's rating of 120/20 volts is believed to be unimportant as the transformer produced the required secondary voltages under all tests.

19. During the test it was discovered that one of the three round head machine screws, securing the terminal panel to the housing, was in contact with a secondary lead, producing a ground. Prior to the dielectric tests, the housing was removed and the secondary leads bent to avoid contact with the screw. Greater care should be used when assembling the transformer.

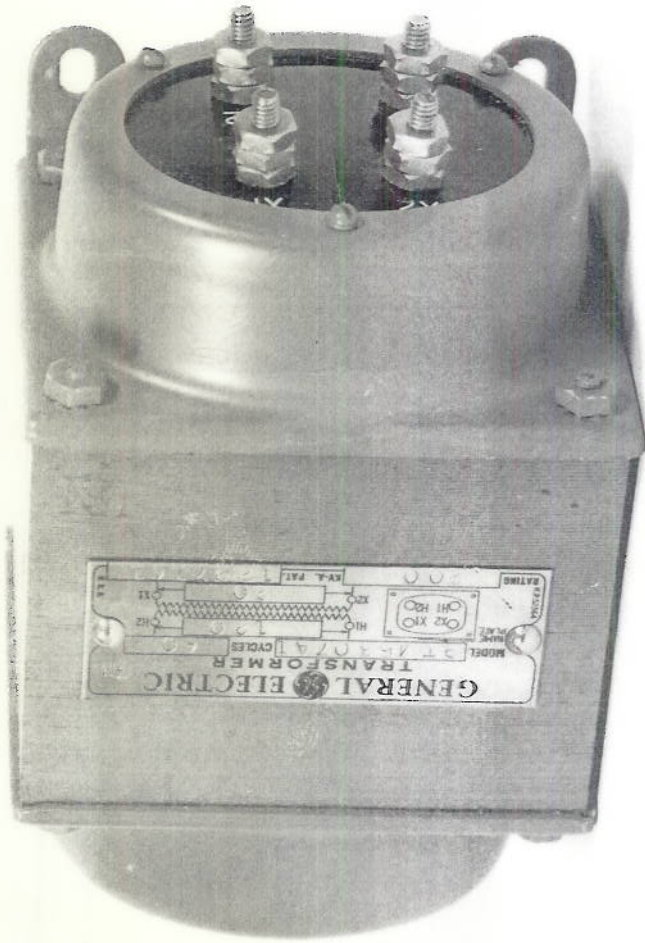
20. The manufacturer has failed to comply with specification, paragraph D-6, requiring the primary and secondary voltages to be clearly marked at the binding posts.

21. The manufacturer has not included on the nameplate, "Type GF" and the number and date of specifications, reference (b).

22. The sample submitted did not embody an aluminum alloy watertight case, required by specification, paragraph E-3d(2). However, it is understood that the transformer will be mounted on the rear of the I.C. switchboard and no watertight case will be necessary.

CONCLUSIONS

23. This transformer is of good workmanship and complied with the major requirements of the specifications, reference (b). If minor changes were made in accordance with "Comments" of this report, the subject material would be suitable for Naval use where a watertight case is not required.



1491