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Proposed Test Code
for
DIRECT-CURRENT
CARBON-PILE VOLTAGE REGULATORS
for AIRCRAFT

(Published for trial use)



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The work of preparing this Test Code was carried out by the Aircraft Electrical Control, Protective Devices and Cable Subcommittee of the AIEE Committee on Air Transportation. The personnel of this Subcommittee was as follows:

B. O. Austin, *Chairman*

E. P. Barlow	W. G. Neild
E. C. Bottemiller	R. L. Olson
W. C. Bryant	J. Ottmar
S. C. Caldwell	J. W. Pobst
R. A. Millermaster	O. C. Walley
A. J. Mustard	

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PROPOSED TEST CODE for DIRECT-CURRENT CARBON-PILE VOLTAGE REGULATORS for AIRCRAFT

1. PURPOSE

1.1 It is the purpose of this code to define uniform acceptable methods of making tests to determine that the rating, performance and other characteristics of generator voltage regulators for aircraft comply with specifications and application requirements.

1.1.1 Aircraft requirements dictate minimum weight and space, and yet utmost reliability is essential. Weight and space reduction, relative to industrial and other regulators, are generally achieved by sacrifice of life expectancy commensurate with aircraft practices. Aircraft operating conditions vary over a very wide range. These operating condition variations are:

- (a) Ambient Temperature
- (b) Atmospheric Pressure
- (c) Shock
- (d) Vibration
- (e) Continuous Acceleration
- (f) Position
- (g) Humidity
- (h) Corrosive Atmosphere
- (i) Sand and Dust Atmosphere
- (j) Fungus
- (k) Explosive Atmosphere

1.1.2 The necessity for accurate design and manufacture requires that direct measurements to insure reliability and adequate life be an important part of this code. It is recognized that there may be acceptable methods of making tests other than those described; but such other methods may be considered as alternative procedures accepted by agreement between interested parties. Also, the tests outlined herein are not necessarily complete for any specific regulator; and likewise the requirements in each case will determine the number of tests to be made. The intent is to formalize and standardize common testing insofar as practicable and to provide a source for convenient reference by those responsible for supervising test procedures.

2. SCOPE

2.1 This code covers carbon-pile regulators which regulate voltage on direct-current generators for aircraft.

3. PERFORMANCE

3.1 The generator voltage regulator¹ shall satisfy

the performance requirements as set forth by agreement between interested parties when evaluated in accordance with tests as described under paragraphs of this code headed as follows:

- (a) Voltage Regulation
- (b) Variable Resistance Element Range
- (c) Regulator Dissipation
- (d) Recovery Time & Stability Characteristics
- (e) Equalizer Coil Effect
- (f) Dielectric Strength
- (g) Ripple Voltage
- (h) Radio Interference
- (i) Regulator Life
- (j) Voltage Setting Range

4. STANDARD TEST CONDITIONS

4.1 Unless otherwise specified, the tests shall be made under the following Standard Conditions:

(a) Ambient Temperature²

- (1) The ambient temperature shall be taken as that of the surrounding air which should not be less than 10C, nor more than 40C.
- (2) No correction need be applied for variation of ambient temperatures within this range
- (3) Temperature tests may be made at ambient temperatures outside of the range specified, if suitable and agreed upon correction factors are available.

- (b) **Pressure**—Normal sea level pressure should be maintained. Variations in ground level pressure need not be taken into consideration.
- (c) **Shock**—None.
- (d) **Vibration**—No simulated vibration.
- (e) **Continuous Acceleration**—None.
- (f) **Position**—The regulator shall be tested in the position which the manufacturer recommends as the standard mounting position.
- (g) **Warm-Up**—Prior to the test, the regulator and generator shall be warmed-up for a period sufficient to stabilize their temperatures.

Note 1—Since the regulator performance is affected by the generator characteristics, the generator used for these tests must have minimum speed characteristics in conformance with Figure 1. The term "Regulator" shall be understood to mean the regulating unit plus bases and supports.

Note 2—The ambient temperature should be measured by means of several thermometers or thermocouples approximately in the same horizontal plane as the regulator being tested, at distances such that the radiated and convected heat from the regulator does not influence the readings and thermometers are protected from drafts and abnormal heat radiation. See AIEE Master Test Code for Temperature Measurement, No. 551.