

MAY 1964



PHILOSOPHY OF VIBRATION TESTING

OF RECEIVING TUBES

FORMULATED BY

JEDEC ELECTRON TUBE COUNCIL

JEDEC PUBLICATION NO. 46

PRICE \$.30



Documents

Document Sharing Hub

Published by

ELECTRONIC INDUSTRIES ASSOCIATION

Engineering Department

11 WEST 42nd STREET, NEW YORK 36, N. Y.



Documents

Document Sharing Hub

PROBLEM HARD COPY

PHILOSOPHY OF VIBRATION TESTING OF RECEIVING TUBES

During the past few years many new proposals concerning vibration testing of electronic and other components used in fixed and mobile gear have been issued. In some instances the particular characteristic intended to be controlled by the proposed testing procedure has not been indicated nor can it be deduced from the test technique. In other instances the intent of the proposal has been indicated, but the test technique leaves some doubt concerning its adequacy for the intended purpose.

The following comments are offered as a guide to assist in the clarification of the purposes, and in the preparation, of test specifications for vibration testing.

There are three prime purposes for which vibration testing is performed: To determine (1) the degree of looseness and/or flexibility in a structure, (2) the frequency or frequencies at which the unit and/or its component parts are resonant and the degree to which these frequencies are excited under the influence of a given applied force, and (3) the durability of a structure under a specified vibrational environment. These three main purposes are referenced in specifications as "Vibration", "Resonance", and "Fatigue" tests.

Vibration testing to determine the looseness and/or flexibility of a structure usually requires a driving mechanism and an aural, visual, or electrical readout system. It is important that the driving mechanism be capable of delivering the desired waveform with low distortion to the test specimen under the required conditions of frequency, force, and loading. Likewise, the specimen holding fixture should be designed to transmit the excitation to the unit under test with a minimum of distortion, attenuation, or amplification. The excitation delivered to the test sample should be monitored at a point on or as near as possible to the test specimen.

Resonance search to determine that no part of the sample under test exhibits a resonance below a certain frequency or to determine at what frequencies the various parts of the sample exhibit resonance phenomena requires the same basic equipment as the vibration test. However, resonance testing usually covers a wide frequency range and therefore places a premium on the elimination of distortion or undesired excitations of the sample by the driving system and holding fixtures. Following resonance search a test may be performed to determine degradation in performance or durability during vibration at resonance.