



EIA STANDARD
for
METHODS OF TEST
FOR
3" IMAGE ORTHICONS

**ELECTRONIC INDUSTRIES ASSOCIATION
STANDARD RS-300**

Formulated by
JEDEC Electron Tube Council

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METHODS OF TEST FOR 3" IMAGE ORTHICONS

(From Standards Proposal No. 817 formulated under the cognizance of JEDEC Committee JTS-4 on Photosensitive Devices)

1. GENERAL

1.1 Reference: IEEE Standard 158, Electron Tubes, Methods of Testing, Part 8, Camera Tubes.

1.2 The results of any test on a camera tube that utilizes magnetic deflection or focus or alignment are dependent on the design of the components used to produce the magnetic fields. The subject of any test must be considered to be the combination of the tube and these field-producing components. These components must be specified in the description of the test.

1.3 Considerable care is required in the design, construction, adjustment, and operation of test equipment in order that the results obtained will be characteristic of the camera tube only and further, that the results will be measurements which can be reproduced on a test equipment of different design. Ordinarily the practical accuracy of these tests is limited to somewhere between 1 and 10%.

2. TEST EQUIPMENT

Critical attention must be given to the uniformity of illumination of the test pattern, to the quality of the lens used for imaging the test pattern on the tube face, to the frequency dependence of amplification and phase shift in signal amplifiers, and to the linearity of amplifiers and oscilloscopes.

2.1 The Picture Monitor Scanning Amplitudes for test purposes are set so as not to overscan the face of the monitor tube in order that the whole raster may be visible at all times.

2.2 The Dimensions of the Image Area on the Photocathode of the image orthicon may be set to the desired size by the following procedure: The desired scanned area is marked off on a sheet of translucent paper. The lens to be used is removed from the camera and is used to image a rectangular test pattern having the desired aspect ratio on the translucent paper. The lens-to-test pattern distance required to make the image of the test pattern fit the marked area on the translucent paper is determined. The lens iris should be fully open for minimum depth of focus during this determination. The lens is replaced on the test camera, care being taken not to change its focal length and the test pattern set at the determined distance. Any point on the lens barrel may be used as the reference point for these measurements as long as it is used consistently.

The Dimensions of the Image Area on the Photocathode Equivalent to the Scanned Area on the Target will depend not only upon the design of the focusing and deflecting coils, but the relative positions of the tube and the coils. In determining these dimensions the proper target scanning area (in accordance with 3.1 under TEST CONDITIONS below) is first established by adjusting the lens to test-pattern distance so that the corners of the 3 x 4 rectangle test pattern just touch the inside of the image-orthicon target ring as viewed on the monitor with the camera tube operating in the over-scanned condition. The corresponding image area dimensions on the photocathode is then determined by reversing the procedure of the method given above in The Dimensions of the Image Area on the Photocathode.

With the camera tube in both optical and electrical focus, and with the scan directions rotated to align with the test rectangle, the scan amplitudes are set to scan the test rectangle by watching the picture monitor.

2.3 The Linearity of Scan is particularly important when measuring the signal uniformity because the signal is proportional to the rate of scanning. The deflection circuits may be adjusted to give a linear scan on the camera tube by means of the EIA Linearity Chart as described in the IEEE Standards on Television: Methods of Measurement of Aspect Ratio and Geometric Distortion, 1954. (IEEE Publication 202). Since lens distortion of the barrel or pin cushion type affects this adjustment, it should be determined that this is not a significant factor.