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INDUSTRIAL CATHODE RAY TUBE  
TEST METHODS

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## INDUSTRIAL CATHODE RAY TUBE TEST METHODS

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This publication was formulated under the cognizance of the JT-20 Committee on Electro-Optic Devices and approved by the Tube Engineering Panel Advisory Council (TEPAC).

## PREFACE

This publication includes all test methods developed by the JT-20 Committee on Electro-Optic Devices for use in testing industrial cathode ray tubes. They are intended to be useful in evaluating cathode ray tubes with respect to parameters which are of interest to users of these devices.

Included in the industrial CRT test methods is the measurement of control electrode voltages (previously issued as TEPAC Publication No. 97). This publication was compiled by the JT-6.16 Subcommittee on Industrial and Commercial Cathode Ray Tubes and approved by the JT-6 Committee on Cathode Ray Tubes and the JEDEC Electron Tube Council. Its inclusion here makes all the test methods for industrial CRTS available in one document.

It is expected that as additional test methods become available, they will be incorporated into future additions to TEPAC Publication 105.

It is also expected that, at an appropriate time in the future, this material will be forwarded to the U.S. National Committee (USNC) of the IEC as a proposed revision, in part, of IEC 151-14.

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## TEST METHOD 105-1

MEASUREMENT OF  
CONTROL ELECTRODE VOLTAGES IN  
CATHODE RAY TUBES

1. Definitions1.1 Cutoff

The cutoff of a CRT is the level of operation below which its output is effectively zero. Cutoff is established by visual extinction of a focused spot (Spot Cutoff), visual extinction of a focused raster of specified size (Raster Cutoff), or a specified Low Cathode Current Level.

1.2 Cut Off

A CRT is cut off when operating at or below the cutoff level.

1.3 Cutoff Voltage

Cutoff voltage is the voltage between grid and cathode necessary to achieve cutoff; i.e., cathode voltage relative to grid 1 for cathode cutoff, grid 1 voltage relative to cathode for grid 1 cutoff or grid 2 voltage relative to cathode (unless otherwise stated) for grid 2 cutoff.

1.4 Cathode Drive (Modulation) Voltage

The difference between the cathode-grid voltage required for cutoff and that required for a specified luminance or cathode current.

1.5 Grid Drive (Modulation) Voltage

The difference between the grid-cathode voltage required for cutoff and that required for a specified luminance or cathode current.

2. Test Methods2.1 Cutoff Voltage

With all electrode voltages and other operating parameters as specified, adjust and measure the voltage applied to the specified current-regulating electrode (cathode, grid 1 or grid 2) to achieve cutoff.

### Precautions

1. In the measurement of spot cutoff, care must be taken to avoid damage to the screen. It is suggested that current be reduced to near extinction of a focused raster before removing scanning.
2. Unwanted deflections of the beam must be avoided.
3. In the measurement of raster cutoff, scanning must be linear to avoid bright areas.
4. In the measurement of both spot and raster cutoff, light incident on the tube face must be below a specified level.
5. In the measurement of both spot and raster cutoff in CRT's with very long persistence it may be necessary to use a "cut on" rather than a "cut off" technique.
6. In the measurement of cutoff to a predetermined current level, care must be taken to distinguish between beam current and leakage currents.

## 2.2 Modulation Voltages

### 2.2.1 Measurement of Grid Drive (Modulation) Voltage

With all operating conditions as specified, raise the grid voltage from the cutoff value toward the cathode voltage until the specified luminance or cathode current is achieved. The change in voltage is the grid drive (modulation) voltage.

### 2.2.2 Measurement of Cathode Drive (Modulation) Voltage

With all operating conditions as specified, reduce the cathode voltage from the cutoff value toward the grid voltage until the specified luminance or cathode current is achieved. The change in voltage is the cathode drive (modulation) voltage.