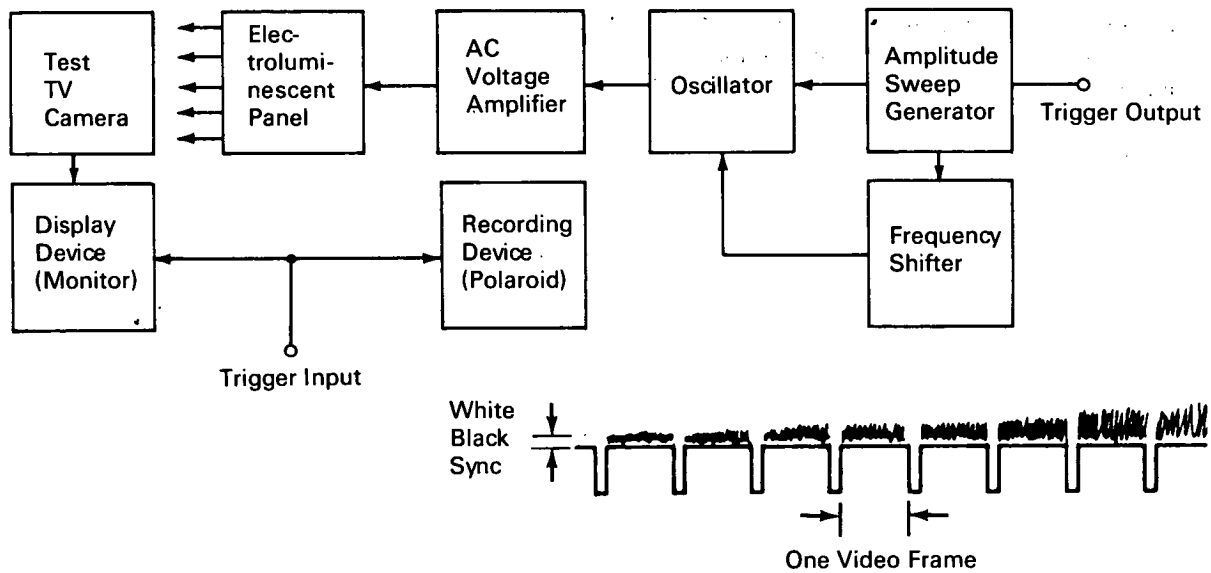
NASA TECH BRIEF

Plotter Design Simplifies Determination of Image Sensor Transfer Characteristic



The problem:

To develop a technique for measuring the transfer characteristic of vidicons and other image sensors. Prior art used a light source of constant spectral emission which could be varied in intensity. To measure the transfer characteristic, the output of the image sensor was read on a current meter and the data were then plotted on a graph. The disadvantages of this method were that the possibility for error was high and its use was time consuming.

The solution:

Measure the light from a calibrated electroluminescent panel as a function of the current output of the image sensor. The plot of current output versus the calibrated light output of the electroluminescent panel is the transfer characteristic of the vidicon.

How it's done:

The vidicon tube to be tested is placed in the TV camera and operated at the desired line and frame rates. The camera is set in light communication with the electroluminescent panel to illuminate the photosensitive area of the vidicon. The sweep rate of the oscillator output voltage is adjusted to allow many frames of video to be taken during one sweep of the oscillator output. As the oscillator amplitude increases, the luminance of the electroluminescent panel increases. Any change in color temperature is compensated for by the frequency shifter. As the luminance increases on the electroluminescent panel, the

(continued overleaf)

vidicon under test converts the light into an electrical signal which is processed by normal means and displayed on a device, which may be a TV monitor, and recorded by a photographic copier, video tape recorder, or recording oscillograph. The video output appears as shown in the lower figure. This plot of current output versus the calibrated light output of the electroluminescent panel is the transfer characteristic of the vidicon.

Notes:

1. The use of this method will save a great deal of time because it controls all the standard conditions for the test and automatically plots the output response.
2. The use of electroluminescent panels permits a wide range in the choice of illumination characteristics.
3. This method could be used as an automatic test unit in the transfer characteristic measurement of television camera tubes, photomultipliers, and phototubes.
4. This development is in a conceptual stage only, and as of date of publication of this Tech Brief, neither a model nor prototype has been constructed.
5. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   NASA Pasadena Office
   4800 Oak Grove Drive
   Pasadena, California 91103
   Reference: B67-10206

Patent status:

No patent action is contemplated by NASA.

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