

TEPAC ENGINEERING BULLETIN

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TEB27

TEB27

AUGUST 1988

ELECTRONIC INDUSTRIES ASSOCIATION
ENGINEERING DEPARTMENT



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This TEPAC Engineering Bulletin was developed by the JT-20 Committee on Cathode-Ray Display Devices.

Published by

ELECTRONIC INDUSTRIES ASSOCIATION
Engineering Department
2001 Eye Street, N.W.
Washington, D.C. 20006

PRICE: \$10.00

Published in U.S.A.

RELATING DISPLAY RESOLUTION AND ADDRESSABILITY

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ABSTRACT

The perceived image quality of a digital display is affected by two independent system characteristics, namely resolution and addressability. This paper discusses a quantitative procedure for selecting optimal levels of resolution and addressability based upon the performance constraints of human vision.

INTRODUCTION

A great deal of confusion exists about the precise meaning of the terms *Resolution* and *Addressability* as applied to display systems. Additionally, once clarity of meaning is achieved, the problem remains of designing a system in which these two quantities are properly related to each other to maximize the quality of the displayed image. Such a relationship is one in which the image meets some perceptual criterion of image quality. This paper, then, is concerned with clarifying the meaning and specification of resolution and addressability in Cathode-Ray Tube (CRT) based display systems and with presenting a visually derived metric for selection of the optimal relationship of resolution and addressability.

In essence, resolution is a property of the design of the display device. It is derived from the width of a line or spot imaged on the screen: The narrower the line or the smaller the spot, the higher the resolution. From the measured line width, resolution can be specified in a number of ways, such as lines per unit distance, Modulation Transfer Function (MTF), spot size, etc. We will consider the line width at 50% of the maximum luminance intensity, since simple conversions exist to translate the various metrics of resolution [1],[2].

Addressability is a characteristic of the display controller and represents the ability to select and activate a specific point of x,y coordinate on the screen. On rastered displays, this is usually stated in terms of the number of lines scanned from the top to the bottom of the display screen as well as the number of points along each raster line.

Since addressability is controlled by the hardware driving the CRT, and since resolution is determined by the design of the CRT, these two display characteristics are independent