ABSTRACT: This paper presents a review of past and current research efforts on the development of thin film electroluminescent x-y matrix display panels. Initial development of a 28x28 line matrix with a resolution of 33 lines per inch is described, with emphasis on performance variations which result from changes in phosphor film thickness and composition. Variations of intensity of emission as a function of a variety of drive conditions is discussed. Suppression ratio measurements of the order of 10^6 are presented. Design criteria established for a matrix of 258x258 electrodes is discussed, and the performance of such panels is described. Final panel configuration provides an active surface area of more than 90 square inches on a single substrate.

Finally, data is presented which indicates that the drive conditions required for the emission of light in the 20-100 foot-Lambert range can be adjusted over a wide voltage range by proper selection of fabrication techniques. This can be accomplished without loss of suppression. Latest results of current life tests will be presented, with a discussion of most recent data available.

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Limitations on High-Energy Cathode Ray Tube Beams with Regard to Phosphor Life, by W. R. Elliott, The Boeing Co., Seattle.

ABSTRACT: The extremely high energy of the electron beam in the cathode ray tube, when the tube is employed as a source of ultraviolet energy for exposing Kalvar dry processed film, presents a problem in preserving the prosphor. In a conventional oscilloscope tube, leaving the spot on one location will eventually cause deterioration of the phosphor. With the beam powers contemplated in this application, allowing the spot to dwell for a fraction of a second will cause not only deterioration but total destruction of the phosphor at that location. The possibility that the dwell time required to obtain sufficient light energy to expose the Kalvar film may be greater than the maximum permissible time thus becomes a major problem.

It is assumed that phosphor damage in a cathode ray tube is a result of the temperature rise of the phosphor. Since most phosphors are quite inefficient, most of the kinetic energy of the electrons in the beam is converted into heat. The temperature rise is determined analytically assuming that the heat is dissipated by conduction in the glass face. ●