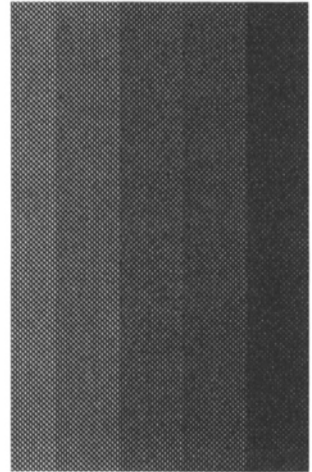


# Highlights

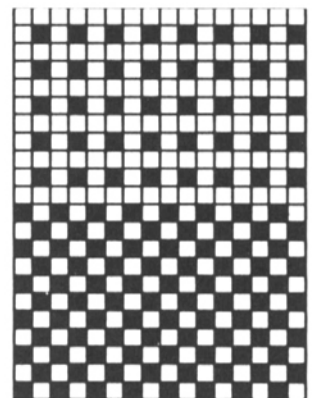
**780 HDTV and Film — Issues of Video Signal Dynamic Range • L. J. Thorpe •** The SMPTE Working Group on High-Definition Electronic Production (WG-HDEP) developed the basis of an HDTV production standard from 1984 to 1987. In September 1988, the SMPTE formally standardized the 1125/60 HDTV studio origination format, now well known as the SMPTE 240M standard. Since that time the work of the WG-HDEP has continued unabated. Prominent among the group's activities have been rigorous development of the digital representation of SMPTE 240M and a broad examination of image transfer of an HDTV production standard to 35mm film (and vice versa). In the digital work the issue of signal dynamic range emerged early as a major topic of study. The desire to better reconcile HDTV image capture with that of film (particularly if intercutting is under consideration), coupled with more efficient use of digital encoding, called for a closer look at the total transfer characteristic of the HDTV camera and how it should be preserved throughout the total system. This article is intended to describe, in tutorial form, some of the new thinking that is emerging on HDTV video dynamic range and how it relates to the perhaps better-known contrast handling capability of motion-picture film negative.



**796 HDTV Production Colorimetry • L. E. DeMarsh •** This article is a summary of the activities of the SMPTE Ad Hoc Group on HDTV Production Colorimetry, which the author has been chairman of since its formation in 1985. The colorimetry of an HDTV production system presents different problems than do current TV systems. HDTV must be planned to accommodate a wide range of displays, some not yet invented. It must also serve as a source signal for motion-picture film and be transformable to other television systems. The key concerns are to define the source HDTV signal completely, independent from a specific display and with a color gamut large enough to accommodate future display technologies. The signal processing also should be designed to preserve the maximum amount of information for post-production signal processing. The committee's approach to addressing these requirements is described.



**805 The Use of Logarithmic and Density Units for Pixels • G. Demos •** The use of logarithmic representation for pixel data may provide maximum flexibility in several areas. The logarithmic representation seems to be an optimum coding for digital brightness representation and also allows easy conversion to and from the linear brightness domain, which is necessary for proper spatial filtering. The ability to provide latitude by simply "sliding" up and down the logarithmic curve can also provide the crucial capability to print-up or print-down or color-correct scenes after initial capture. Density units are a natural analogy to logarithmic units for digital input scanning of motion-picture film. The film itself, however, will have introduced a toe and shoulder to the dark and light parts of the image. The natural relationship between film density and logarithmic units, as well as the ability to provide latitude and correction capabilities, makes the logarithmic pixel representation a significant candidate for high-definition television (HDTV) and computer graphics.



**817 Precision, the Dominant Factor in Motion Picture Machines • SMPTE Classic Reprint, Originally Published 1916 • W. B. Wescott •** We, in this body, will undoubtedly spend much time and thought on standards, and it seems to me that a cursory survey of the most important of these standards would be pertinent at this time — especially in their relation to each other, and the allowable departure from the standard; that is in the precision measure of the standard. I think that you will agree that the final criterion of all motion picture standards is to be found in *the Picture on the Screen*. Hence, we may confine our efforts at standardization to those elements in which departures from a precise standard affect, directly or indirectly, our clear, steady picture on the screen.

for any factor when the other factors are a constant.

Therefore, in order to build up a system of standards for the motion picture industry which shall be concordant, we must define and limit our standards, however they may be determined, in terms of precision measure — a percentage allowable variation. And to determine this *all-important precision measure* for any standard, we must refer to the picture on the screen as viewed by a standard spectator.