Color Television Study Committee Meets

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THE NEWLY formed Color Television Study Committee* held its first meeting at the Headquarters of the SMPTE in New York on Thursday, September 26, 1968. Each of the organizations invited to participate in the activities of this Committee was represented by one or more engineers. If the meeting were to be categorized by a single word, that word would be *enthusiasm*. It is evident that the problem of variability of color seen on television receivers in homes has been worrying discerning engineers for many months, and this Committee is expected to be a means for improving the situation.

Early in its deliberations, the Committee recognized that variation of color on a home viewer's screen could result from a change of any single component of the whole chain between the original live scene and his picture tube. If the Committee were to avoid being bogged down in a lengthy and detailed study of every one of the components of the broadcasting system, it would be imperative that the most serious causes of variability be identified and the efforts of the Committee be concentrated on those causes.

The honest concern of the Committee members over the problem of variability of color seen on home receivers was at no time more evident than during the ensuing discussion aimed at locating the causes of the most serious variations. Transmitter people mentioned the difficulty of ensuring that an operating transmitter is within its tolerances and pointed out that not only were measuring techniques incompletely specified, but that, all too often, suitable measuring equipment for use in an individual transmitting station was not readily available. The receiver people spoke of problems ranging from inadequate design of receivers to the impossibility of frequent changing of circuit design to keep up with the proliferation of phosphors in picture tubes, with chromaticities different from those mentioned in the FCC Rules. Beyond the problems of scene lighting and of colors of costumes and sets, the broadcasters expressed their greatest concern over the standardization of alignment or adjustment of monitors used for evaluating color quality as a program is sent on its way. Those members of the Committee skilled in the field of film and of video tape pointed out that either of these recording media often caused color shifts. In film the problems may arise from both scene staging and film processing. On the other hand, in video tape the major sources of concern are operating techniques and shortcoming of equipment design.

One important observation was made during this discussion. Variations in the broadcasting system are more noticeable on a receiver having a white balance at the present value of 9300 K than on a receiver for which the white has been color-matched to Illuminant C, on which the FCC Rules have been established.

As a result of this discussion, the Committee agreed that initially, its efforts should be directed toward investigation of the following topics:

(a) colorimetry of television camera systems;

(b) color film and film-camera chains;

(c) standardization of color monitors;

(d) characteristics of tubes and chromaticities of phosphors of color picture tubes; and

(e) tolerances on the numbers which make up the specifications for the broadcast signal, as found in the FCC Rules and EIA Specifications.

Some aspects of the colorimetry of color television cameras are being studied by the Studio Facilities Committee TR-4.4 of EIA, but a small group was appointed by Chairman Benson of the Color Television Study Committee, under the chairmanship of E. P. Bertero (a representative of NAB), to review the problems and to recommend appropriate action.

Arrangements were made for a field test in the Chicago area to determine the effects on a received picture of variations in the radiated signal within the tolerances permitted by the FCC Rules. Several transmitters and receivers will be used in this test. The transmitters will be made available for the tests by the networks represented on this Committee through the NAB. The performance of the transmitters at the times of the tests will be checked by the transmitter operators and by members of EIA Committee TR-4.1. Receivers will be furnished not only through EIA Committee R-4, but also through the efforts of the IEEE representatives on this Committee.

To complement this field test, a request was directed to the SMPTE that its Engineering Committee on Video-Tape Recording be asked to determine the effect on the output signal from a video-tape recorder of varying the input signal within the tolerances permitted by the FCC Rules.

In addition, the SMPTE Engineering Committee on Television has been asked to expand its study of color monitors to include an investigation of the possibility of standardizing the chromaticities of the phosphors used in the picture tubes.

It was brought out by several members that a study group of the Canadian Broadcasting Corp. had collected information on some of the problems facing the Color Television Study Committee. Chairman Benson was directed to invite the appointment by CBC of an observer to this Committee to broaden the base of its study.

* "Uniformity of television color reproduction," *IEEE Spectrum, 5:* No. 11, p. 161, Nov. 1968; William T. Wintringham, "Ad Hoc Color Television Study Committee formed," *Jour. SMPTE, 77:* 1203–1204, Nov. 1968.