AUDIO STANDARDS

Work in Progress: AES Standards Committee; Engineering Committees; and Related Groups

Since the introduction in our 1970 June issue of a new department listing Audio Standards Organizations and existing Magnetic Tape Sound Recording Standards, engineering committees of the Audio Engineering Society have been working with other professional standards groups to eventually bring about approved standards affecting the audio engineer.

This new Journal department has been the outgrowth of action taken at the 1970 Spring AES Convention, during which the Society's first engineering committee met to discuss master tape recording equipment. The meeting was jointly chaired by John T. Mullin of the 3M Mincom Division and John G. McKnight of Ampex.

Excerpt of Notes Taken at 1970 Spring Meeting:

1. Initially, the discussion centered around the fact that 16-track tape machines using 2-inch-wide tape are never used at 7.5 in/s, although most such machines provide this speed besides the 15 in/s normal speed. The consensus: Studios should order such machines for the 15/30 in/s speeds to allow the industry the advantages of recording at the higher speed.

2. John Mullin distributed a four-page set of curves and specifications, which showed that as much as 9 dB of signal-minus-noise level advantage could be obtained at 15 kHz at 30 in/s compared to 15 in/s.

   This improvement, said McKnight, could be taken in signal overload level increase, noise level reduction, or some combination of the two. A committee poll failed to indicate a preference for the method to be taken.

   Lacking an existing meaningful equalization standard for 30 in/s recording, and because today's tapes are not made for such high speeds, it was decided to continue the current practice of Ampex 30 in/s test tapes (i.e. 9 kHz transition frequency corresponding to a 17.5 μs "time constant") as an interim standard to permit experimentation by individual 16-track users.

   30 in/s TEST TAPE: Since existing test tapes are available for one-inch and two-inch formats (full-track and multi-track) at 15 in/s, but not at 30 in/s, it was proposed that these test tapes be used with a correction table: The 15 in/s tape is to be played at 30 in/s, and the response set to follow the tabulated values.

   The interim suggestion was to use the 9 kHz transition frequency, and a flat low-frequency response (similar to IEC and CCIR low end). For those desiring minimum noise, the "flat-flux" curve may be used, for those desiring maximum "brilliance", 6300 Hz (25 μs) values were recommended. Tables illustrating the above are available upon request from the Journal's editorial offices and are given for the multi-track test tape, including a fringing correction for use with a full-track tape. (NOTE: Since this meeting, Ampex has started producing a 2-inch-wide, 30 in/s test tape, with flat low end and 9 kHz transition frequency.)

3. It was suggested that special labels be supplied to users of this interim method to identify all tapes so recorded. Stephen F. Temmer, Secretary of the Engineering Committee, was asked to pass on results of the meeting to European manufacturers.

4. Those attending the meeting felt it would be desirable to establish a permanent AES Engineering Committee on Master Tape Recording Equipment to develop a meaningful final standard.

Further investigation and communications by committee members following the meeting revealed some confusion with regard to 30 in/s tape mastering equalization.

Clarification on this point by McKnight follows:

1. "THE CURVE WE PROPOSE IS NOT NOW NOR HAS IT EVER BEEN CCIR." The current IEC Pub. 94 (3rd ed, 1968, and a new amendment now in process), and the old CCIR Rec. 261-1 (1966) all call for 30 in/s equalizations having "time constants" of infinity and 35 μs. We propose using the CCIR low end only, but the 18 μs hi end (9000 Hz transition frequency) is a "de facto Ampex standard" which has never been officially standardized.

2. CCIR makes standards for the international exchange of tapes between broadcasting organizations; they have no international competence in standards for other purposes, i.e. mastering for sound records.

3. The new CCIR standard (1970) recognizes only 15 and 7.5 in/s speeds as "primary speeds;" a secondary speed is "under consideration." Thus, according to the latest CCIR Recommendation, there is no "CCIR 30" at all. The new standard states that the equalizations "should be made in accordance with the current edition of IEC Publication 94."

Since the recommended curve is without proper identification, it is recommended at this time that the 30 in/s equalization curve having a single transition frequency of 9000 Hz be called: "Proposed AES Recommended Practice Number 1."

All 30 in/s test tapes sold by Standard Tape Laboratory (STL), and all sold by Ampex since 1965, have been in accordance with the Proposed Practice Number 1.