in the transmission system particular attention should be paid to tolerances. In general the tolerance of any factor in a system should be such that its effect on the accuracy of that system is of the same order of magnitude as the effect of the other factors. With this in mind the following observations can be made:

(1) If the convention of keeping the longer focal-length lenses on the left is not followed, then camera and projector lens pairs should be kept to within $\frac{1}{4}$ of 1% if the error in A at the edge of the screen created by focal length disparity is to be of the same order of magnitude as the other errors.

(2) The error in reading graphs, such as those of Figs. 5 and 6, has been included as an error in the setting of camera interaxial and convergence. Such an error can be reduced by the use of a computing device, such as the one developed by the Motion Picture Research Council.[5]

(3) Errors as large as 5% can be tolerated in the measurement of the camera-to-object distance, and in the setting of camera interaxial and convergence.

(4) The optic axes of the cameras should have the same inclination within 2′ of arc.

(5) The error due to camera registration could be minimized by the use of shorter focal-length lenses.

(6) In general, the lack of registration in the cameras is a greater contributing factor toward the unsteadiness of the two aspects than is the lack of registration in the projectors, even if the film width is the same and the per cent lack of registration is the same in both filming and projecting.

(7) Errors in printing are relatively insignificant.

(8) The errors in projector convergence and declination should be kept to within $\frac{1}{2}$ of 1%.

(9) Because the human visual apparatus can handle a greater degree of intermittent movement of point pairs in the horizontal direction than in the vertical direction,[7] film registration should be more exact in the vertical direction.

(10) All steady errors increase around the borders of the screen.

(11) All errors increase for close-ups.

(12) Errors are less acute for spectators seated farther from the screen.

(13) A scene shot in 16mm and projected in 16mm on a given size screen will appear stereoscopically identical to the same scene shot in 16mm but projected in 35mm on the same size screen.

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Recent Developments in Feedback Lateral Disk Recorder

ABSTRACT

By C. C. DAVIS

THE WESTREX 2B Recorder has an improved spring-hinge arrangement. Previously there had been a tendency toward a shift in the operating axis of the cantilever spring at frequencies above 10 kc, causing sharp dips in the recorded frequency response in this range. The recent interest in recording higher frequencies has resulted in a modification which has largely eliminated these "holes." The modification consists of extending the body of the coil form to the normal rotational axis of the hinge. This fin-shaped extension revolves about an axis which coincides with the axis of the spring one-third the distance from the spring clamp to the coil form. It is embedded at this point in a compliant material which allows the hinge to flex normally but discourages rotation about any but the intended axis.

Stylus-heating facilities have been provided in the 2B Recorder. These consist of two small terminals to which may be attached a simple heater coil energized with 6 v from an a-c source. The heater coils are designed to slide over the stylus and are held in place by the natural spring tension of their leads.

Acetate playbacks of L.P. recordings at 10 kc and at a 6-in. diameter show as much as 10-db improvement in noise and a gain of 16 db in signal, when cut with heated sharp styli as compared to unheated dulled-edged styli intended for cold use. The temperature at the stylus tip is in the neighborhood of 350 F and can be measured with waxes having known melting points. With the hot-stylus attachment the coil form is modified to use tapered-shank styli and a removal tool has been designed for their ready installation and removal.

The advance-ball assembly has been redesigned to permit positioning the advance ball directly ahead of the recording area and it is provided with an additional lateral adjustment for tracking exactly in line with the material to be removed in order to prevent scars remaining on the record if a particle of dirt collects under the advance ball.

A new amplifier has been designed to operate with the 2B Recorder.

The high and low frequencies may be increased or decreased several decibels by adjustment of the feedback control. When adjusted to normal the system is flat from amplifier input to reproducer output from 30 cycles to 11 kc. A dip of about 4 db centers at 15 kc, beyond which a long rise occurs extending to approximately 28 kc where the level exceeds that of the midrange. The feedback has little control beyond 11 kc and the peak at 28 kc appears solely due to a secondary mechanical resonance. However, this rise in response serves a useful purpose because the system may be equalized to a point well beyond 20 kc by the insertion of a single equalizer to boost the level in the 15-kc range.

Records made with the new recorder and its associated amplifier show low intermodulation and unusually accurate reproduction of square waves.

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