

element. This starts with the compacting of all show elements into a single reel of videotape. This feature makes feasible the concentration of all routine production operations in a central area (Fig. 11). Programs are prepared in advance on the 1-in Edimation format. The studio operator/mixer receives only a reel of videotape containing image and the original-language soundtrack. At the end of a dubbing session, he delivers to the production center the same reel, complete with the "automatically edited" dialog track.

Our experience in Mexico has been that the dialog for a typical half-hour television show is completed in an average of five hours — one hour for transfer from 2-in quadruplex to 1-in helical videotape and four hours of studio time. (The average dubbing rate is 30 loops per hour.) Adding one hour for pulse-sync transfer from videotape to magnetic film, we have a total of six man-machine studio hours for the production of a half-hour edited dialog track.

Future Planning

As mentioned earlier, additional audio tracks have a role in more advanced versions of the system (Fig. 12). The introduction of *three* under-video slant tracks carries the system one step further to accomplish the following:

(1) During transfer of videotape programs to the Edimation format, the international track (music and effects) as well as incidental "live" effects are transferred, under the video image, along with the original-language track in pulse-sync interlock.

(2) After dialog dubbing, all elements are contained on a single roll of videotape, ready for re-recording. In this installation, re-recording follows immediately after the dialog session in the same studio, on the same console and by the same operator. Also, all elements are available for review and inspection by the director during the dialog recording session in order that he may better evaluate the quality of his work as it will sound in combination with the music and sound effects.

With the Edimation concept at the present state of development, we expect that an 8-hour man-machine-studio shift will do the language conversion for a typical half-hour television show and have it ready to go on the air the day after the materials are delivered to the studio. The method, as now applied, has cut literally weeks from the turnaround time. With that knowledge and incentive, we are approaching our final goal: 24-hour delivery.

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5. John D. Silva, "Audio Scoring, Dubbing and Transfer Techniques Used in Video-Tape Productions," *J. SMPTE*, 70: 419-425, June 1961.
6. John Mosely, "Quintaphonic Sound," *SMPTE J.*, 86: 20-29, Jan. 1977.

Errata

Historical Notes on Television Before 1900

By George Shiers

March 1977 *Journal*, pp. 129-137

Page 129, line 28: Instead of "bars of crystalline selenium solution . . ." read "bars of crystalline selenium . . ."

Page 130, line 24: Instead of "of Valentia" read "at Valentia."

Page 132, Table I, middle of left column: The name "Perry" should be with Ayrton, not with Carey; top of right column. For 1885 through 1893, these dates and the names next to them should all have been placed next to the top line of the column to their right.

(See corrected table at the right.)

Temporal Considerations Differentiating Sound in Review Rooms vs Theaters

By Daniel Queen

MARCH 1977 *Journal*, p. 149

Equation 4 should have read:

$$\overline{p^2} \propto \frac{Q_D}{4\pi r^2} + \frac{4(1-\alpha)}{S\alpha}$$

Table I. Chronology of events to 1900.

1817	Berzelius	Discovers selenium		patent, first detailed description of a complete single-circuit system	
1828	Nicol	Polarizing prism			
1843	Bain	Automatic copying telegraph, single circuit, linear scan, line-by-line sync	1885	Bakhmet'ev	Single circuit, spiral scan
1845	Faraday	Magneto-optic effect	1889	Weiller	Mirror drum, manometric modulator
1873	Smith	Photosensitivity of selenium	1890	Sutton	Nipkow disc, Kerr cell modulator, phonic wheel and tuning fork sync
1875	Kerr	Electrostatic birefringence	1890	Brillouin	Lensed disc, variable aperture modulator, picture analysis
1876	Kerr	Magneto-optic effect by reflection	1893	Le Pontois	Nipkow disc, manometric modulator, tuning fork and pulsating current sync
1876	Bell	Telephone	1893	Blondin	Variable aperture modulator
1878	De Paiva	First proposal for an electric telescope	1893	Morse	Multicircuit selenium mosaics, high-voltage supply
1879	Redmond	Multicircuit mosaic experiments	1894	Majorana	Slotted discs
1880	Ayrton, Perry	Multicircuit, shutter mosaic, Kerr polepiece mosaic	1894	Jenkins	Multicircuit selenium and glow lamp mosaics, dynamo supply
1880	Carey	Multicircuit mosaic instruments, first proposal for a complete system	1894	Swedish	Single circuit, spiral scan
1880	Sawyer	Single circuit, spiral scan, spark receiver, picture analysis	1897	Szczepanik	Vibrating mirrors, zigzag scan, interruptor sync, color effect, voice transmission
1880	Leblanc	Vibrating mirror, linear scan, variable-aperture modulator, color suggestion	1898	Dussaud	Nipkow disc, clockwork drive, variable-aperture modulator, carbon arc lamp, screen projection
1881	Senlecq	Double circuit, incandescent mosaic, one-shot scan, pulse sync	1898	Vol'fke	Nipkow disc, gas tube modulator, radio transmission
1882	Lucas	Optical receiver, linear scan, screen projection	1899	Polumordvinov	Slotted discs for black-and-white, concentric cylinders with filters for color
1882	(Atkinson)	Mirror drum, manometric modulator, experimental apparatus made but not published	1900	Perskyi	Word "télévision"
1884	Nipkow	Perforated scanning disc, clockwork drive, Faraday effect modulator, first TV			