Characteristics of Color Film Sound Tracks

A Report of the SMPTE Color Committee

Subcommittee on

Color Film Sound Track Characteristics

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DURING A TWO-YEAR PERIOD from 1948 through 1949, the Society and individual equipment designers studied extensively the possible use of blue-sensitive phototubes and lead-sulfide photocells for sound reproduction, but specific conclusions could not be reached.

One effective obstacle to the study was the dearth of information about the appearance, behavior and physical characteristics of the several 35-mm and 16-mm color film sound tracks that were likely to be encountered in commercial applications.

The Society's Color Committee, under the Chairmanship of Dr. H. H. Duerr, was asked to help in this work and accordingly appointed a Subcommittee on Color Film Sound Track Characteristics. This latter group assembled the necessary basic information through a questionnaire that was submitted to all known color film manufacturers and presents its findings here in tabular form.

It should be noted that while all processes listed can produce release prints with emulsion in the standard position as defined in American Standards Z22.3–1946 (35-mm) and Z22.16–1947 (16-mm), in commercial practice some of them do not. These are the 16-mm reversal processes, when used to make release prints on reversal print stock by contact printing from reversal originals.

The Subcommittee wishes to express its appreciation to the manufacturers whose products are represented, for their co-operation in this survey.

	Manufacturer		Product	Appearance of Track			Composition	Relative Transmission to					Reproduction Characteristics			Density or Area Track Preferred	
	Name	Address	Name	Emulsion	Base	Through		Infrared	Red	Green	Blue	Ultraviolet	"Red" Phototube	"Blue" Phototube	Lead Sulfide Tube		
35-MM FILM																	***35-MM FILM***
Agfacolor	Agfa	Wolfen, Germany	Agfacolor Positive	Yellow-brown	Blue-black	Black-and-white	Dye and silver	No information. Note: Because of silver content, should resemble black-and-white film tracks.					Preferred	Should be satisfactory	No information	Either	*Agfacolor*
Americolor	Color Film Co. of America	New York, N.Y.	Americolor	Opaque Blue-gray matte surface	Opaque blue-gray matte surface	Opaque blue-gray matte surface	Silver dichromate	No information					Satisfactory	No information	No information	Either	*Americolor*
Ansco Color	General Aniline & Film Corp., Ansco Div.	Binghamton, N.Y.	Ansco Color Printing Film Types 732 and 832	Matte surface	Glossy surface	Light amber modulated area	Silver sulfide	Moderate, with moderate to maximum modulation	Moderate, with maximum modulation	Little, with moderate modulation	Little, with moderate modulation	No information	Preferred	For dye track only	Not tested	Either	*Ansco Color*
Cinecolor	Cinecolor, Inc.	Burbank, Calif.	Cinecolor	Blue matte surface	Blue, glossy	Blue	Iron tone	None	None	Moderate to maximum	Moderate to maximum	Moderate	Preferred	Usable	Requires further study	No preference	*Cinecolor*
Dufaychrome	Dufay-Chromex Ltd., Film Lab.	Thames Ditton, Surrey	Dufaychrome	Normal black-and-white	Normal black-and-white	Normal black-and-white	Silver	Same as black-and-white					Normal black-and-white	Normal black-and-white	Normal black-and-white	Either	*Dufaychrome*
Dufaycolor	Dufay-Chromex Ltd., Film Laboratories	Thames Ditton, Surrey, Eng.	Dufaycolor (additive)	Similar to black-and-white	Dark, glossy	Opaque track with colored reseau background	Silver	Sensibly uniform transmission in the visible spectrum; somewhat higher transmission in the ultraviolet and infrared.					Suitable[1]	Suitable[1]	Suitable[1]	Either[1]	*Dufaycolor*
Du Pont Release 225	Du Pont Photo Products Div.	Parlin, N.J.	Du Pont Color Release Positive 225 Type	Brownish red, matte	Brownish red, glossy	Brownish red	Metallic plus dye Dye only	Little Maximum	Little Moderate	Little Little	Little Little	Little Maximum	For metallic plus dye	For dye track only	For metallic plus dye	No preference	*Du Pont Release 225*
Polacolor	Polaroid Corp.	Boston, Mass.	Polacolor	Silver	Silver	Magenta stain	Silver	Same as black-and-white					No preference[2]	No preference[2]	No preference[2]	No preference[2]	*Polacolor*
Technicolor	Technicolor Motion Pic. Corp.	Hollywood, Calif.	Technicolor 35-mm	Silver	Silver	Silver	Silver	Same as black-and-white					Normal black-and-white	Normal black-and-white	Normal black-and-white	Either	*Technicolor*
Trucolor	Consolidated Film Industries, Inc.	West Fort Lee, N.J.	Trucolor 35-mm	Normal	Normal	Blue-black	Metal plus dye	Absorbs	Absorbs	Some transmission	Some transmission	Some transmission	Preferred	Usable	Usable	Either, variable area preferred	*Trucolor*
16-MM FILM																	***16-MM FILM***
Ansco Color	General Aniline & Film Corp. Ansco Div.	Binghamton, N.Y.	16-mm Ansco Color Duplicating Film Type 232	Matte surface	Glossy surface	Brownish	Silver sulfide	Moderate, moderate to maximum modulation	Moderate, maximum modulation	Little, moderate modulation	Little, moderate modulation	No information	Preferred	Not recommended	No information	Either	*Ansco Color*
Kodachrome	Eastman Kodak Co.	Rochester, N.Y.	16-mm Kodachrome Type 5265	Semi-matte	Glossy	Brownish	Nearly pure silver sulfide	Moderate, moderate modulation	Moderate, maximum modulation	Little, maximum modulation	Little, moderate modulation	No information	Preferred	Not recommended	No information	Either	*Kodachrome*
Cinecolor	Cinecolor, Inc.	Burbank, Calif.	Cinecolor, 16-mm	Blue matte surface	Blue, glossy	Blue	Iron tone	None	None	Moderate to maximum	Moderate to maximum	Moderate	Preferred	Usable	Requires further investigation	No preference	*Cinecolor*
Dufaychrome	Dufay-Chrome Ltd., Film Lab.	Thames Ditton, Surrey	Dufaychrome 16-mm	Normal black-and-white	Normal black-and-white	Normal black-and-white	Silver	Same as black-and-white					Normal black-and-white[3]	Normal black-and-white[3]	Normal black-and-white[3]	Either[3]	*Dufaychrome*
Technicolor, "A" Process	Technicolor Motion Picture Corp.	Hollywood, Calif.	Technicolor 16-mm, "A" Process	Black matte	Black, glossy	Black	Silver iodide plus dye	Little	Moderate	Moderate	Moderate	Moderate	Preferred[4]	Usable[4]	Not recommended[4]	Either[4]	*Technicolor, "A" Process*
Technicolor, "B" Process	Technicolor Motion Picture Corp.	Hollywood, Calif.	Technicolor 16-mm, "B" Process	Blue, glossy	Blue, glossy	Blue	.....	Little	Little	Moderate	Large	Large	Preferred[5]	Not recommended[5]	Excellent response[5]	Variable area[5]	*Technicolor "B" Process*

[1] The reseau background is so fine that no audible whistle results, or the whistle has very low level if the cell has a uniform sensitivity. In practice the recording level is raised slightly or the fader setting increased 1 or 2 points to offset the reseau density.

[2] Normal black-and-white silver track.

[3] Track is silver, same as for black-and-white.

[4] Track is similar to Eastman 16-mm Kodachrome.

[5] Track is used on Technicolor 16-mm Inbibition prints.