

Flux and Flux-Frequency Measurements and Standardization in Magnetic Recording

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In order to have interchangeable tape recordings, standards are needed for flux-frequency response and for the absolute value of the recorded flux. It is shown that the recorded signal is best measured and specified as the "shortcircuit flux per unit track width"; measurements techniques are reviewed. The need for equalization and the division into recording and reproducing equalization are developed. Standard equalizations of many organizations are shown as flux-frequency responses. Standard reference fluxes and operating levels are tabulated and discussed. The terms necessary for response and level standardization are proposed and defined and, since terms are not defined in presently published standards, those defined here are compared with usages of the standards.

Table III. Flux-Frequency Response Currently Specified by Various Standardizing Organizations: Summary of Transition Frequencies and Time Constants.

Speed		Transition frequencies ¹⁰		Equivalent time constants ¹⁰		Standardizing organization
cm/s	in/s	f _l , Hz	f _h , Hz	t _l , μs	t _h , μs	
76	30	0	9000	∞	18	Ampex professional equipment
		0	4500	∞	35	CCIR (1953 or earlier to 1966); IEC (1968); DIN (1962)
38	15	50	3150	3180	50	NAB (1953 and 1965); EIA (1963)
		0	4500	∞	35	CCIR (1953 or earlier through 1966); IEC (1968); DIN (1962)
19	7.5	50	3150	3180	50	Ampex professional equipment; NAB (1965); RIAA (1968); EIA (1963); DIN home (1966)
		0	3150	∞	50	EIA Standards Proposal 1015; Ampex Stereo Tapes & Consumer Equipment (1967 to present)
		0	2240	∞	70	CCIR (1966); IEC (1968); DIN Studio (1966) ^a
9.5	3.75	50	1250	3180	120	EIA (1959); Ampex professional equipment (1959 to present) ^b ; DIN (1962)
		0	1600	∞	100	EIA Standards Proposal 1015; Ampex Stereo Tapes & Consumer Equipment (1967 to present)
		50	1800	3180	90	NAB (1965); RIAA (1968); IEC (1968) ^c
4.76	1.87	50	800	3180	200	Ampex Consumer Products
		100	1250	1590	120	DIN (1966); IEC (1968); RIAA (1968); Philips Compact Cassette system

^a ∞ - and 100-μs were formerly used by CCIR, IEC and DIN.

^b 3180- and 200-μs formerly used by Ampex (1953-1958).

^c 3180- and 140-μs formerly used by IEC (1964).

10. The transition frequencies have all been rounded to the nearest "preferred frequency", according to USA Standard S1.6-1967. Where "time constants" are given, these are the exact values given in standards.

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