

AUSTRALIAN BROADCASTING CONTROL BOARD

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TECHNICAL SERVICES DIVISION

REPORT NO. 33

TITLE: High-speed Duplication of Video Tape Recordings

Issued By:

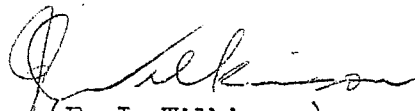
The Chairman,
Australian Broadcasting Control Board,
562-574 Bourke Street,
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TECHNICAL REPORT NO. 33

TITLE: High-Speed Duplication of Video Tape Recordings

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High-Speed Duplication of Video Tape Recordings

Equipment capable of high speed duplication of video tape recordings has only recently been developed, and is now available commercially. Previously, video tape recordings had to be replayed in real time if copies were required. For large scale distribution of programmes this frequently meant the production of multiple generations of recordings in the process of programme production and distribution, each generation being inferior to those preceding it. The advent of duplicating systems which operate much faster than the real time of recording, reduces the number of generations required for large scale duplication, and provides a means for economic programme distribution.

Ideally, this should provide duplicates which are indistinguishable from the original, but some degradation may occur due to -

- (a) loss of replay level,
- (b) relative movement between the master and copy tapes during the transfer process,
- (c) nonuniformity of magnetic transfer either across the tape or along the tape,
- (d) degradation of the master tape.

For broadcasting purposes these impairments should be kept to a minimum consistent with the state of the art, and in any case should not be discernible in terms of picture quality. Tentative performance limits proposed for consideration by industry as part of preparatory work towards the development of broadcasting standards for video tape equipment on a record/replay basis are as follows -

Video

50 Hz square wave tilt	1%k
Sinc-square pulse and bar (2T)	
(i) pulse to bar ratio	± 2%k
(ii) pulse shape	2%k
(iii) bar tilt	2%k
Chrominance/luminance amplitude error	± 6%
Chrominance/luminance delay error	± 40 ns
Luminance non-linearity	5%
Chrominance/luminance cross talk	± 2%
Differential gain	± 7%
Differential phase	± 6°
Noise level	- 40 dB
Moire patterning at least 22dB below blanking - ref whit level	

Sound

Amplitude/frequency response

50 Hz - 14 kHz ± 2.5 dB (reference 1000Hz)

Distortion		
	50 Hz	5.5%
	1000 Hz	3.5%
Noise		- 50dB
Wow and flutter		0.15%

Limits for time-base stability also have to be set but these depend upon automatic timing correction circuits in the replay mode.

Performance limits quoted above can be taken as an indication of the quality expected in broadcasting.