

AES CALIBRATION RECORD
AES-S001-064
Speed: 77,92 rpm.
Coarse groove, lateral monophonic cut

Side A

Gliding Tone 20 Hz to 20 kHz. Time Constants: 3180/450/0 μ s.

1 kHz tone at a level of 20 mm Light Band Width (LBW), approx 8 cm/sec peak;
5,7 cm/s rms.

The gliding tone, or sweep, is timed at 50 s to allow synchronisation with Bruel and Kjaer (B&K) equipment, such as response Test Unit 4416 and Recorder 2305/7, and other equipment with a similar facility. An initial 1 kHz tone before the sweep provides the automatic start signal for the B&K system.

The nominal level for the gliding tone is 10 dB below the 20mm LBW tone.

The level tolerance on the sweep is approximately ± 1 dB. The main purpose of the sweep is to reveal any sudden departure from an even response such as might be caused by resonances within the playback system.

The sweep and reference tone is repeated at a smaller diameter to allow measurement of playback tracing losses.

Side B

Fixed tones 18 kHz to 30 Hz. Level at 1 kHz (0 dB in the recorded characteristic curve) is +5 dB above 1 cm/s rms stylus velocity.

The curve employed (see chart below) is the "Coarse Groove" curve specified in IEC Publication 98 Ed.2; also British Standard 1928:1955. Time Constants: 3180/450/50 μ sec. For frequencies above 10 kHz, levels are reduced by 6 dB. All frequencies are announced.

Frequency		Frequency	
1 kHz	0 dB	3 kHz	+2,75 dB
18 kHz	+9,25 dB	2 kHz	+1,5 dB
16 kHz	+8,25 dB	1 kHz	0 dB
14 kHz	+7,25 dB	700 Hz	-0,75 dB
12 kHz	+6,0 dB	400 Hz	-2,25 dB
10 kHz	+10,5 dB	200 Hz	-5,75 dB
8 kHz	+8,75 dB	110 Hz	-9,75 dB
6 kHz	+6,75 dB	60 Hz	-13,25 dB
5 kHz	+5,5 dB	30 Hz	-15,5 dB
4 kHz	+4,25 dB		

From the original metal master, matrix No. CTPX 17791, that was made at Abbey Road Studios and released as catalogue number JGS 81 in 1955. Pressed under license from EMI Records Ltd.

Because this calibration record is pressed in vinyl it is *not* recommended for playback by acoustic (mechanical) reproducers or with earlier electrical pickups using steel styli.

Store in a cool dry place

A note on speed standards

For records with a nominal speed of rotation of 78 rpm, the International Standard IEC 98 of 1958 set a blanket tolerance of +/- 0,7 %. In fact, practical speeds were determined by the synchronous motors used for professional cutting equipment - such as the lathes made by Neumann, Scully, Presto, Lyrec, and Westrex. Because they were locked to the power supply frequency they provided a very precise rpm. Some equipment used slow-moving direct drive multi-pole motors to achieve the final speed, or they used mechanical gearing. In either case, the speed ratios could only be simple ratios of the power-line frequency, and were not identical when 60 Hz operation is compared to 50 Hz operation.

Recognising this, Edition 2 of IEC 98, published in 1964, stated speed tolerance more accurately:

Rated speed of rotation	50 Hz electric supplies	60 Hz electric supplies
Nominal 78 rpm	77,92 rpm +/- 0,5 %	78,26 rpm +/- 0,5 %
Nominal 45 rpm	45,11 rpm +/- 0,5 %	45,00 rpm +/- 0,5 %
Nominal 33 1/3 rpm	33 1/3rpm +/- 0,5 %	33 1/3 rpm +/- 0,5 %

Both sides of this record were cut on a lathe operating on 50 Hz power and so are clearly labelled, "77,92 rpm".

The speed error when replayed on a power-line-locked 60 Hz turntable would also be about +0,5 %, however such turntables are rare. Even so, in its primary application of confirming the replay characteristic of a reproduction chain, the error contributed by a 0,5 % increase in reproduced frequency would be small. In practice, most turntables use friction drive idlers or belts - where the speed tolerance is more poorly defined - or employ a crystal-referenced direct drive that is independent of power-line frequency so that the speed may be adjusted to arbitrary precision and to compensate for any error.

For further information see www.aes.org/standards/data

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