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Harman Kardon CD91 Cassette Deck

MODESTLY priced cassette decks have tended in recent years to compete largely on the basis of their features — “bells and whistles,” in industry jargon. The Harman Kardon CD91 is a notable exception to this general design trend. Here the manufacturer has decided to forgo all but such essential features as Dolby-B noise reduction in order to use the same tape head and transport mechanism found in some of the company's more costly models. The result is a two-head, single-motor cassette deck whose superior performance belies its budget price.

The Harman Kardon CD91 uses a Sent dust record/playback head, and its single capstan is belt-driven by a d.c. servomotor that also powers the reels. Cassettes are inserted, tape openings downward, into slides behind the lightly damped cassette-well door. Rear illumination and a transparent strip on the door permit viewing the approximate amount of tape remaining, though the cassette label areas are not visible. The door can be removed easily for routine cleaning and demagnetizing.

Transport operation is solenoid-controlled via transistor logic that permits rapid push-button switching from one mode to any other (even from rewind to record) without using the stop button. The record and pause buttons have tiny LED indicators, but in line with its “no frills” design the CD91 has no record-mute button to insert silent spaces between selections, nor is there any memory

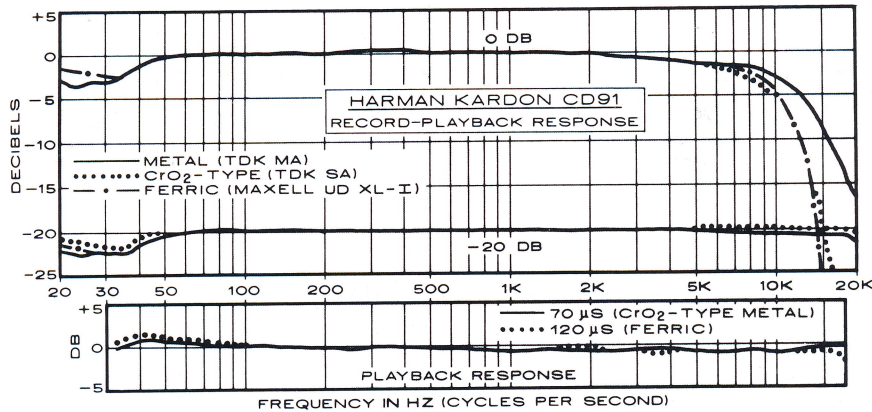
or timer rewind or memory play. Three pushbuttons set the proper record bias and equalization for ferric, CrO₂-type, and metal tapes. No microphone circuits are included, though it is possible, of course, to connect the outputs of an external microphone mixer in place of the regular line-level inputs. Recording levels are set by a single large control along with a smaller channel-balance knob. There is no playback-level control, so this function must be handled by your amplifier. Pushbuttons are used to switch the Dolby-B noise-reduction system and an FM-multiplex filter in or out; an LED lights when the Dolby system is in use. Recording levels, shown by tiny peak-reading, twelve-element LED displays, are calibrated from -20 to +8 dB, with 0 dB corresponding to Dolby level. A three-digit mechanical counter and reset button are provided, along with the customary front-panel headphone jack.

The rear panel of the CD91 contains only the line-in and line-out phono jacks, and there is no provision for timer activation. Overall, the unit measures 17¾ inches wide, 4¾ inches high, and 13½ inches deep, and it weighs a little over 13 pounds. Price: \$250.

• *Laboratory Measurements.* Our sample of the CD91 came supplied with the cassettes used to set up the deck — Maxell UD XL-I (ferric), TDK SA (chrome-equivalent), and TDK MA (metal) — so we used these for our measurements. Other premium for-

mulations from TDK, Maxell, Sony, and BASF gave comparable results, consistent with their own slight characteristic differences. Playback response was checked with BASF's IEC standard calibrated tapes. As the playback graph shows, response was remarkably flat throughout the 31.5-to-18,000-Hz test-tape range. Indeed the same was true of overall record-playback response, which was within 1 dB of ideal from 40 to 20,000 Hz and within +0, -3 dB from 20 to 20,000 Hz when measured at the conventional -20-dB level. At a 0-dB recording level all three tapes showed the usual high-frequency tape saturation, with response down by 5 dB at 10,000 Hz (SA and UD XL-I) and at 12,500 Hz (MA).

At a 0-dB recording level the third-harmonic distortion of a 400-Hz tone measured 1 per cent with Maxell UD XL-I, 1.45 per cent with TDK SA, and 0.75 per cent with TDK MA. To reach the 3 per cent distortion point used for signal-to-noise measurements required raising the input level by 3.5, 2.5, and 5.5 dB, respectively. Referred to the 3 per cent distortion point, unweighted signal-to-noise ratios without Dolby-B processing measured 49.8 dB (ferric), 53 dB (CrO₂-equivalent), and 56 dB (metal). Adding Dolby-B and CCIR/ARM weighting increased the S/N's to 61.5, 64.8, and 66.8 dB, respectively. These values are close to the best that can be obtained with state-of-the-art tapes and Dolby-B.



The upper curves indicate overall record-playback response at the manufacturer's indicated 0-dB recording level using the tapes designated on the graph. In the center are the same measurements recorded at -20 dB relative to the upper curves, a level conventionally used for tape-deck frequency-response measurements. Bottom curves show playback response from calibrated test tapes and indicate performance with prerecorded tapes.

Wow-and-flutter, checked with a Teac MTT-111 test tape, measured 0.04 per cent wrms and 0.06 per cent with the DIN peak-weighted standard, which is very good, though not exceptional, performance. The Dolby calibration was exact, and Dolby-B tracking error — the difference in low-level frequency response with and without the Dolby system — was within ± 1 dB throughout the frequency range. The multiplex filter affected high-frequency response above 15 kHz and provided 32 dB attenuation at the 19-kHz FM-stereo subcarrier frequency. The input sensitivity of the CD91 was 0.061 volt (61 mV), and its output at 0 dB measured 0.48 volt (480 mV). Fast-forward and rewind times for a C-60 cassette

measured 88 seconds, which is about average.

• *Comment.* The CD91 did an extremely good job of playing back top-quality prerecorded cassettes from InSync and Mobile Fidelity. Although its two-head design precluded direct A-B comparison while recording, it did a more than capable job of dubbing from discs and other tapes. The frequency response was outstanding, though on material with a wide dynamic range some background hiss was audible with the ferric Maxell UD XL-I. With TDK SA (chrome-type) and MA (metal) the added background noise (intrinsic in all analog copying) was more sensed than distinctly heard.

Mechanically, the CD91 behaved flaw-

lessly throughout our tests. The controls were positive and precise in their operation, and, while we found the recording-level displays annoyingly small and hard to read accurately, they certainly provided adequate indications for everyday recording.

Some recordists may find the lack of some features, such as Dolby-C or microphone inputs, sufficiently important to justify looking at a higher-priced deck. But that's the proper way to regard features. The Harman Kardon CD91 is an "entry-level" deck, but in terms of high-fidelity performance it is markedly superior to many decks that cost far more.

— Craig Stark