

CD cassette decks

harman/kardon high technology cassette decks



Since the beginning of high fidelity back in the early 1950's, we've committed ourselves to one goal in all Harman Kardon stereo equipment. Musical quality.

Along the way, we've made some important innovations, many of which are now taken for granted in modern stereo components.

One of Harman Kardon's most significant contributions was the introduction of the first cassette deck with Dolby B* Noise Reduction circuitry back in the early 1970's. This was perhaps the single most important development in making the cassette deck viable for the serious audiophile.

And, in 1980, Harmon Kardon was the first manufacturer to incorporate Dolby HX* circuitry in cassette decks. This circuitry increased high frequency headroom resulting in a much improved signal-to-noise ratio and a decrease in distortion.

The first line of decks to equal the range of human hearing.

It's been known for nearly a century that the range of human hearing extends from 20 to 20,000Hz. And for at least the last 15 years, every stereo component has had to meet that standard in order to be considered high fidelity.

Yet until now, only a handful of the most expensive cassette decks—often costing more than the rest of your system—have been able to accurately reproduce the entire frequency range.

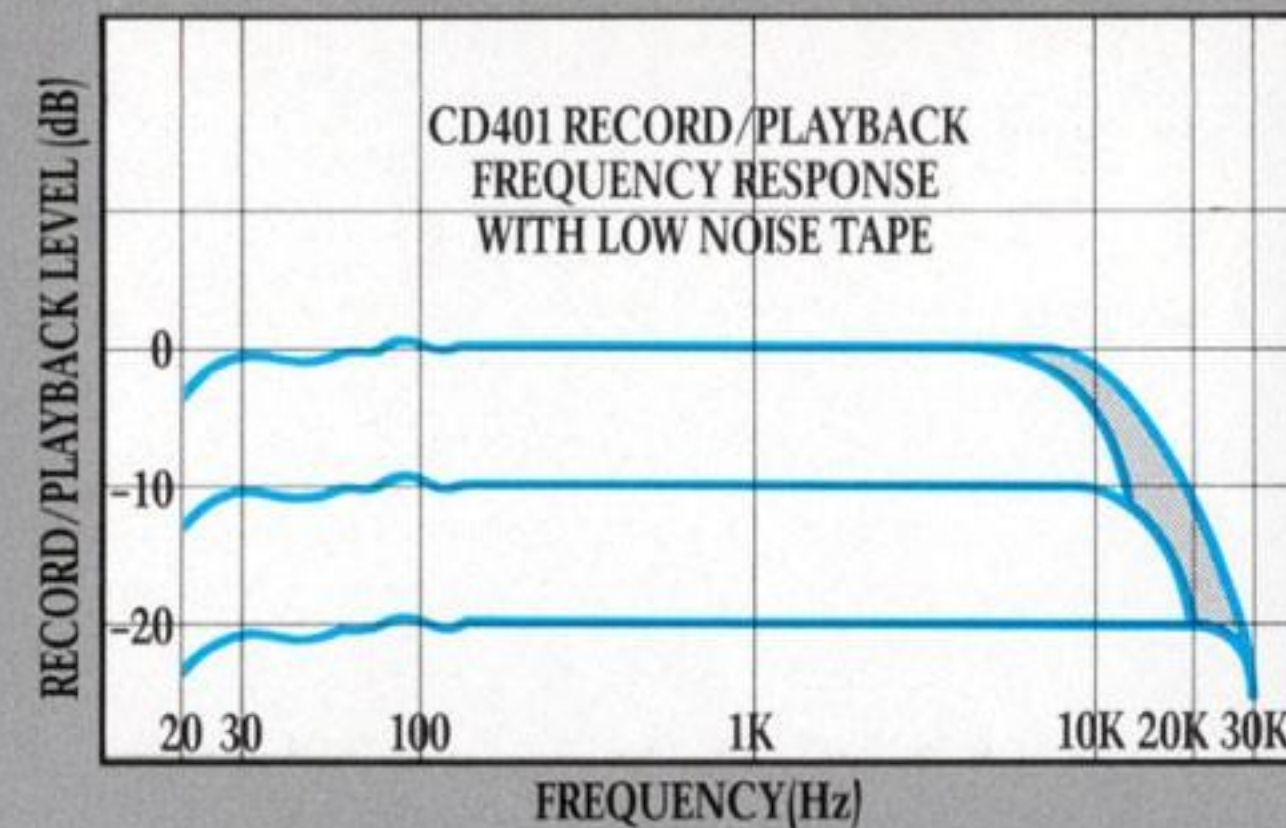
Now Harman Kardon introduces the CD Series of cassette decks.

Every deck in the line matches or exceeds the frequency range of human hearing to an accuracy of $\pm 3\text{dB}$. From the deepest bass reverberations at 20Hz, to the highest shimmering overtones at 20,000Hz. And every deck achieves this with any tape formulation, not just costly metal tape.

Perhaps most important of all, the entire line is priced like ordinary decks.

Which means that anyone who is serious about stereo systems can now afford a cassette deck with true high fidelity performance.

Our line starts with the CD101 which gives a remarkable 20Hz-21,000Hz $\pm 3\text{dB}$ with any tape formulation at a price that is far below what you'd pay for other decks with similar performance. Our top-of-the-line CD401 not only outperforms any deck on the market, its 20Hz-24,000Hz $\pm 3\text{dB}$ frequency response is fully capable of sounding as clean and open as the source material being recorded. Other manufacturers may quote seemingly similar upper and lower frequency response specifications, but without the $\pm 3\text{dB}$ tolerance. Without the tolerance specified, these limits can be greatly exaggerated and therefore misleading.



Shaded area represents improved response due to Dolby HX Professional resulting in recordings sounding smoother, brighter and more dynamic.

Frequency response like we deliver requires special care in every step from the drawing board right through production.

Every deck in our line, for instance, uses heads that are optimized for each design. The heads are machined to demanding tolerances and aligned with extraordinary precision. These steps are time consuming, but that's the price of the wide, flat frequency response we demand.

The equalization and bias circuitry in a cassette deck also dramatically affect frequency response and overall sound quality. While most manufacturers design their circuits to make production simpler, we designed ours to give you the best possible performance. Again, a costly but necessary step.

Dolby HX Professional* Optimizes High Frequency Response

At low recording levels (-20dB), carefully engineered tape heads and circuitry are enough to ensure accurate high frequency response. But at high recording levels (0dB) another solution is needed, because high levels can cause tape saturation. Expensive metal tape

has partially solved this problem. But for our CD Series, we wanted something better. So our two top decks, the CD301 and CD401, incorporate Dolby HX Professional.* This new feature actually raises the overload level of low-noise and chromium dioxide tapes and even improves the response of metal tape. By continuously monitoring and optimizing bias current, Dolby HX Professional* gives you more high frequency headroom to avoid the harshness that occurs when tape becomes saturated.

And since a cassette recorded with Dolby HX Professional* needs no decoding, you can enjoy its improved sonic performance on any cassette player you own, including the one in your car.

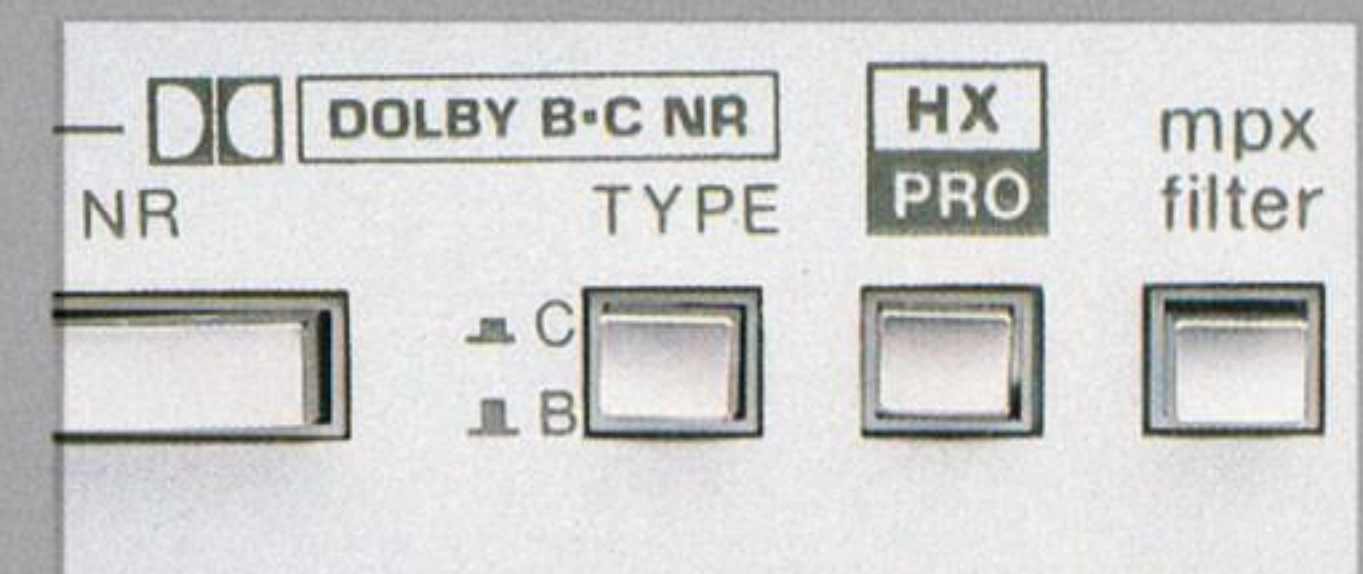
Dolby C* Noise Reduction Keeps Tape Hiss Inaudible

Until recently, a major limitation of the cassette medium has been tape hiss, which can be aggravating during softer passages of music—or even mask them entirely.

The standard Dolby B* noise reduction circuitry found on all of our decks helps to reduce tape hiss considerably.

In addition to this, Dolby C* noise reduction circuitry, found on our top three decks, provides twice the effect of Dolby B*—which drops the noise floor below the level of audibility.

Our CD301 and CD401 decks also incorporate a special test tone generator and calibration adjustment that allows you to adjust the Dolby B* and C* tracking for accurate encoding with any tape.



Ultrawideband Record And Playback Electronics

In order for our cassette decks to provide the wide, flat frequency response that we determined to be absolutely necessary, we developed record EQ circuits that extend high frequency compensation to as high as 26kHz. In contrast, most decks on the market today, including some high priced models, have record EQ that extends to only 16kHz or 18kHz. Consequently, their frequency response rolls off sharply beyond that point.

Playback amplifier circuits boost the weak signals at the output of the tape heads. In the Harman Kardon tradition, the CD series playback electronics have been designed with ultrawideband circuitry that extends well beyond the audible range. In the models CD201, CD301, and CD401 this means a range from 10Hz to 100,000Hz, compared with conventional narrowband designs that barely exceed the 20Hz-20,000Hz range.

Ultrawideband electronics are important because they allow our decks to respond instantly to transients, such as the crash of a cymbal or the attack of a piano. The same ultrawideband circuitry also improves stereo imaging, allowing you to "place" the various instruments in space—exactly as they appeared in the original live performance.

The output amplification circuitry of our Dolby C* models is further enhanced by the use of low-noise FET transistors. This prevents the amplifier from generating noise that would be noticeable on your quietest Dolby C* recordings.

Uniplane Transport Provides Accurate Tape Movement

If a tape deck is to provide accurate reproduction, it must provide an accurate transport mechanism. The drive motor must be able to withstand electrical surges from the power source and maintain smooth, constant tape speed as the reels vary from full to empty.

All the decks in the new Harman Kardon line use specially designed DC servo motors in the transport system, which maintain a perfectly constant speed despite fluctuations in power and load. These motors are coupled to massive, dynamically balanced flywheels for the high stability and torque necessary for smooth, controlled tape movement.

In addition, Harman Kardon decks are constructed with our exclusive Uniplane Transport. With all moving parts mounted on a single, rigid reference plane, two distinct advantages are gained. First, wow and flutter are dramatically reduced, because the design eliminates vibrations caused by longer, conventional shafts. Second, misalignment problems are also reduced substantially because end-play is eliminated between front and rear mounting brackets.

Solenoid Controls On All Our Decks Give Smooth, Trouble-free Performance

Many companies use solenoid controls only on their most expensive tape decks. At Harman Kardon, we use them on all models. They're not only more convenient, allowing you to switch directly from mode to mode without stopping, they also decrease the chances of tape jamming in the transport mechanism.

Metal Tape Capability

Each model in our new line of Harman Kardon decks is equipped to use all existing types of tape on the market. These include the standard "low-noise" ferric tapes, chromium dioxide (CrO₂), ferrichrome (FeCr), and the new metal tapes.

Memory System Lets You Return To Any Preset Point

The top three cassette decks in our line include our Automatic Memory feature, which allows you to return to any preset point on your tape automatically. You simply reset the tape counter to zero once you've found your desired point.

To return to that point, press the rewind or fast forward button and the deck will stop automatically when the tape counter reaches zero.

Electronic Auto Search Finds The Exact Selection You Want

Our top two decks, the CD301 and CD401 incorporate Harman Kardon's Electronic Auto Search system that lets you scan a tape automatically to locate any passage you'd like to hear. With the Electronic Auto Search system turned on, the deck will automatically scan forward, playing approximately eight seconds of music from the beginning of each selection. The system will continue scanning at fast forward speed, sampling each selection until the desired one is located. The Electronic Auto Search system is defeated by simply pushing the "play" button.



Bias Trim Control For The Ultimate In Fine Tuning

Most cassette decks let you select a bias level for the specific type of tape you're using—metal, chromium dioxide, ferrichrome, or low noise. But, tape formulations vary from manufacturer to

manufacturer, which means the bias setting that's right for one brand of tape is not quite right for others. That's why we've included a fine bias trim control on all our decks. Once you've selected the proper bias button for the type of tape you're using, you can fine-tune the bias even further for optimum recording quality.

Our CD301 and CD401 decks also include a special bias tone generator, which helps make precise bias fine tuning quick and easy.

Two-Position Meter Ballistics For Easier Reading

We've used LED record level indicators on all our decks because they provide the fastest, most accurate response available. We've also included a two-position meter ballistics button on our CD201, CD301, and CD401 models. Occasionally, the LEDs will release too fast for an accurate reading. The "slow" position on the ballistics button allows the LEDs to rise just as fast, but holds peak readings slightly longer, so you can adjust the record level more accurately and more easily.

Front Panel Output Level Control

For convenience and safety, we've included an output level control on the front panel of all our cassette decks. This control not only allows you to adjust headphone volume, but also lets you match the output level (volume) of your deck to the output levels of your other components. This prevents large changes in volume while switching from one component to another—changes that can be annoying to you, and damaging to your speakers.

CD101 cassette deck

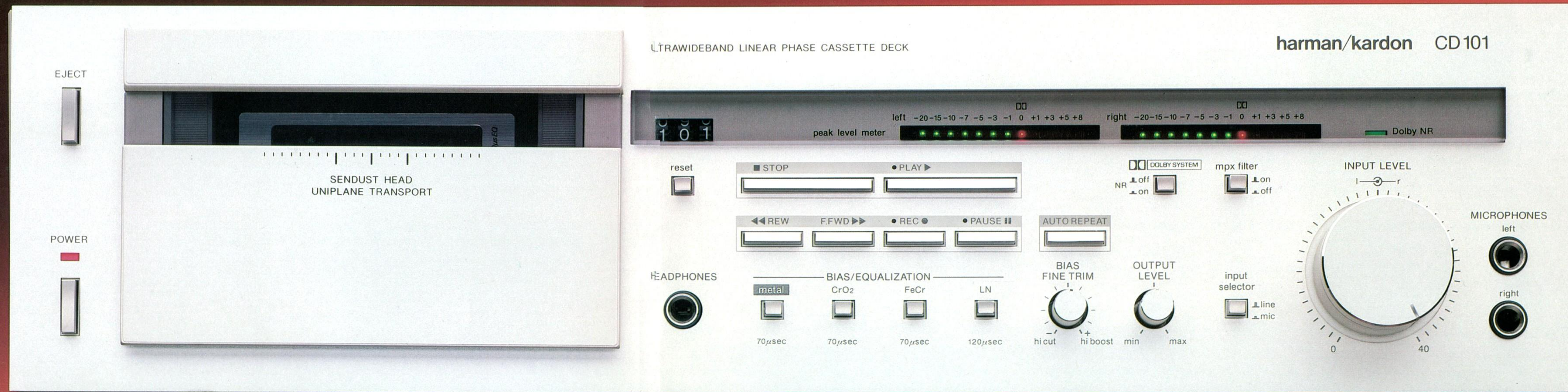
Now for the first time, you can get extraordinary sonic quality in a cassette deck that's moderately priced. The CD101 from Harman Kardon.

When using any tape formulation, you can expect an impressive frequency response of 20Hz-21,000Hz \pm 3dB. Most other cassette decks in the CD101's price range require chrome or even expensive metal tapes and give you only 30Hz-17,000Hz.

To keep your recordings quiet during softer passages, Dolby B* noise reduction increases the signal-to-noise ratio to a very quiet 65dB.

In addition, the CD101 provides features rarely found on decks in its price range. Like solenoid controls, a bias fine trim which allows you to adjust the bias precisely for the specific tape formulation you're using, and an output level control on the front panel that lets you match the output levels of your other components. An Auto Repeat System automatically rewinds and replays a tape once it's reached the end.

Even if you're looking for your first cassette deck, the CD101 is probably well within your budget. But it sounds like it costs hundreds of dollars more.



CD 201 cassette deck

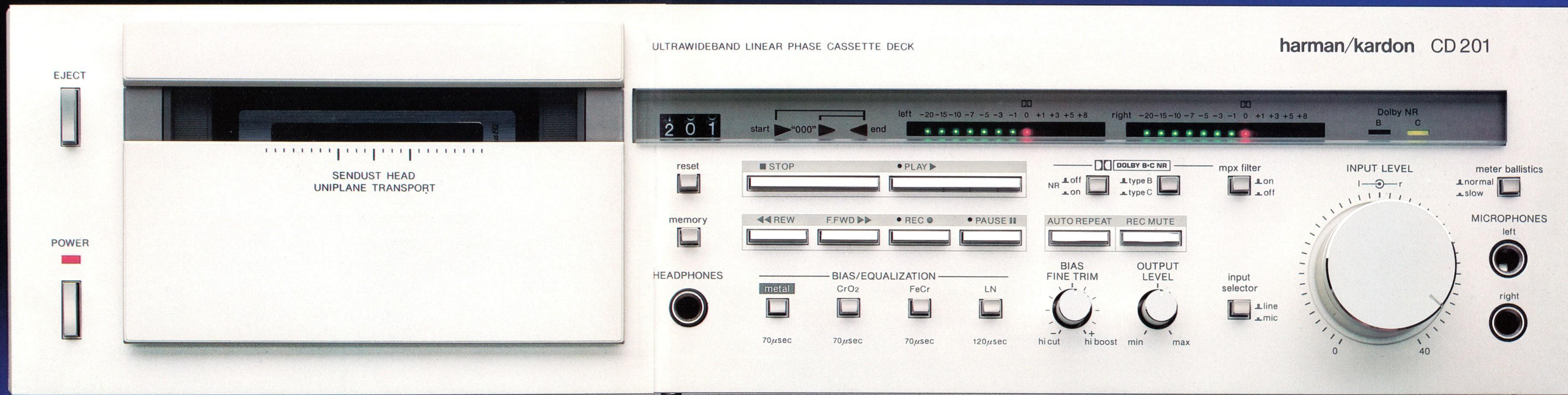
The CD201 is the lowest priced deck in the Harman Kardon line to combine extraordinary frequency response and the added noise reduction available with the new Dolby C* circuitry.

Like the CD101, the CD201 gives you spectacular frequency response for the money—20Hz-21,000Hz \pm 3dB with any tape formulation. And thanks to Dolby C,* the signal-to-noise ratio is 72dB, keeping tape noise inaudible.

The CD201 also incorporates features that give you both extra convenience and added control over your recordings. With the Auto Repeat System engaged, the CD201 will automatically rewind and replay a tape once it's reached the end. The front panel output level control lets you conveniently match the output of the CD201 with the outputs from your other components.

For precision recording, you also get a bias fine trim that lets you adjust the bias precisely to the tape you're using. And the dual position ballistics meter lets you hold peak readings longer for easier recording level adjustments.

Simply put, the CD201 gives you fidelity far superior to any deck in its price range.



CD301 cassette deck

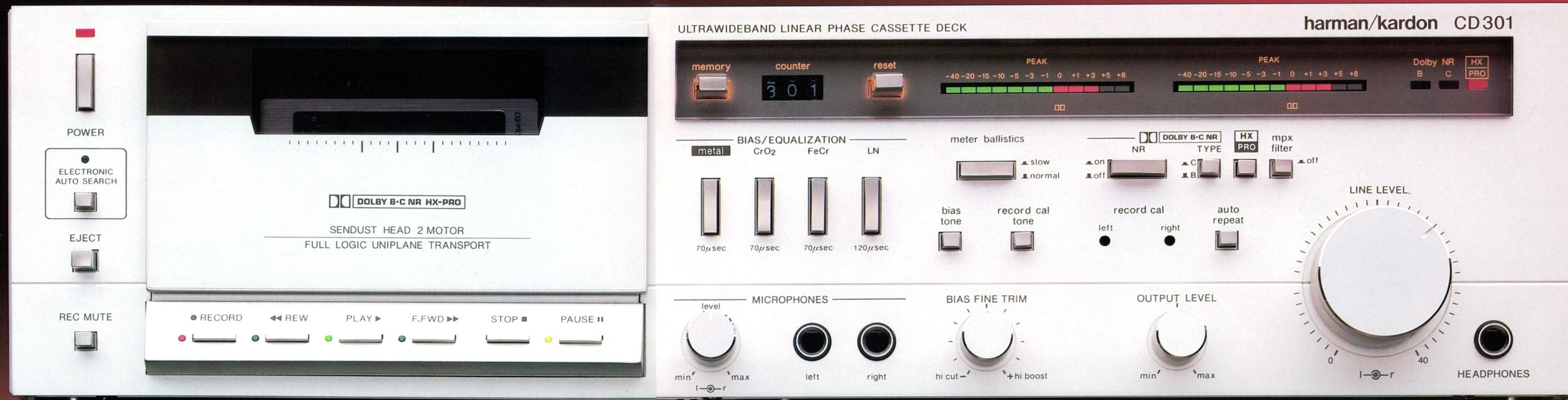
If it weren't for our top-of-the-line CD401, you'd be hard pressed to find a better deck than our CD301, anywhere.

The CD301's frequency response stretches all the way from 20Hz-22,000Hz \pm 3dB with any tape formulation. In addition, the Dolby HX Professional circuitry gives you much smoother high frequency response at normal recording levels, with greatly reduced distortion. And Dolby C* boosts the signal-to-noise ratio all the way to 72dB.

The CD301 not only provides the feature of bias fine trim, but also gives you a bias tone generator for exacting adjustment. A built-in record calibration generator helps you adjust the Dolby NR* threshold quickly and precisely.

The CD301 also gives you our exclusive Electronic Auto Search System, which automatically scans forward, playing eight seconds of every selection until you've found the one you want. And our Auto Repeat System allows you to automatically rewind and replay your tape once it's reached the end.

Listen to the CD301. Then listen to any other deck near its price. There simply is no comparison.



CD 401 cassette deck

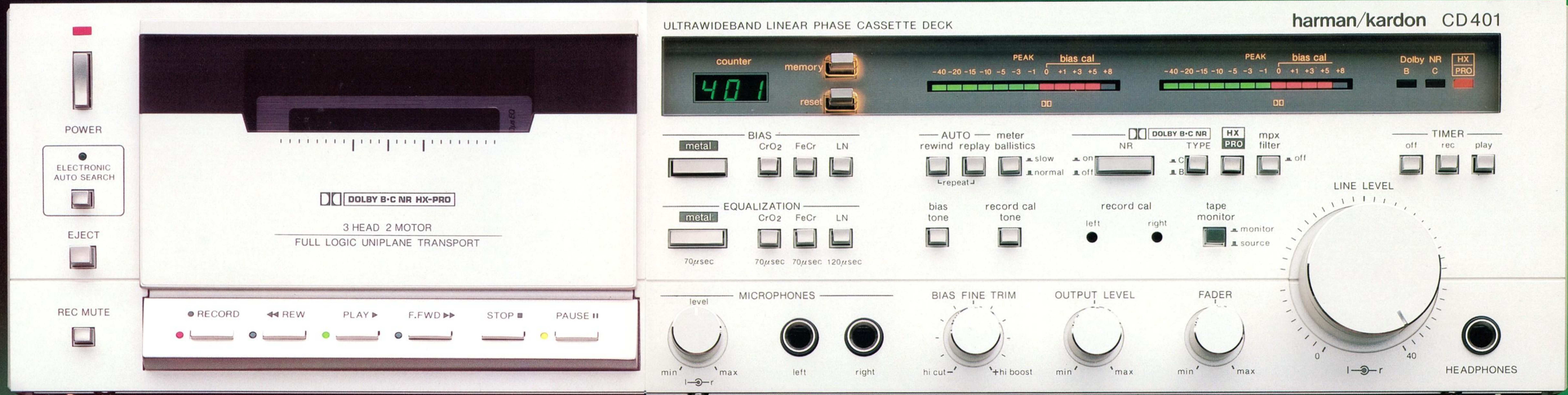
For sheer performance, there is no competition for the CD401. The CD401's frequency response stretches all the way from 20Hz-24,000Hz \pm 3dB with any tape formulation. With a signal-to-noise ratio of 74dB, the CD401 sets new reference standards for the high fidelity cassette deck.

The CD401 is our most sophisticated design. With three heads for monitoring, Dolby HX Professional,* and dual Dolby B* and C* circuitry.

The CD401's separate bias and equalization controls, tone generators and playback calibrators allow you to control all facets of the recording process for optimum results no matter which tape you choose.

In addition to our Electronic Auto Search which helps you to locate any specific selection automatically, the CD401 also gives you our Auto Repeat System. Engage the Repeat System, and when the tape ends, the deck will automatically rewind to its beginning and will continuously replay the tape automatically, rewinding and replaying each time the tape ends.

The CD401. Don't compare it to any other cassette deck. Compare it to the source you're recording.



*"Dolby," "Dolby B," "Dolby C," "Dolby HX Professional" and double-D symbol are trademarks of Dolby Laboratories, Inc.

Specifications	CD101	CD201	CD301	CD401
Tape Speed (i.p.s.)	1 ⁷ / ₈	1 ⁷ / ₈	1 ⁷ / ₈	1 ⁷ / ₈
Heads	2	2	2	3
Frequency Response Any Tape Formulation	20-21kHz ± 3dB	20-21kHz ± 3dB	20-22kHz ± 3dB (W/HX-PRO)	20-24kHz ± 3dB (W/HX-PRO)
Wow and Flutter: NAB, WRMS DIN, WTD	0.05% 0.08%	0.05% 0.08%	0.04% 0.07%	0.04% 0.06%
Signal-To-Noise Ratio (CrO ₂) Dolby OFF Dolby B Dolby C	57dB 65dB —	57dB 65dB 72dB	57dB 65dB 72dB	59dB 67dB 74dB
Total Harmonic Distortion (1kHz, Metal Tape, Dolby Level)	0.9%	0.9%	0.9%	0.9%
Channel Separation	> 35dB	> 35dB	> 35dB	> 35dB
Channel Crosstalk	> 60dB	> 60dB	> 60dB	> 60dB
Erase Ratio	> 60dB	> 60dB	> 60dB	> 60dB
Bias Frequency	105kHz	105kHz	105kHz	105kHz
Fast Forward and Rewind Time (C-60)	90 sec	90 sec	75 sec	75 sec
Peak Reading Meter Range Output Level (0dB, 10k Ohms)	-20dB to + 8dB 1.2V	-20dB to + 8dB 1.8V	-40dB to + 8dB 1.8V	-40dB to + 8dB 1.8V
Input Sensitivity (0dB) MIC Line (low) Line (high)	0.5mV 50mV —	0.5mV 50mV —	0.8mV 75mV 250mV	0.8mV 75mV 250mV
Input Impedance MIC Line (low) Line (high)	10k Ohms 20k Ohms —	2.7k Ohms 15k Ohms —	2.7k Ohms 15k Ohms 33k Ohms	2.7k Ohms 15k Ohms 33k Ohms
Headphone Impedance (Minimum)	8 Ohms	8 Ohms	8 Ohms	8 Ohms
Height (with feet)	4 ¹³ / ₁₆ " (122mm)	4 ¹³ / ₁₆ " (122mm)	4 ¹³ / ₁₆ " (122mm)	4 ¹³ / ₁₆ " (122mm)
Depth (with knobs)	13 ¹ / ₂ " (343mm)	13 ¹ / ₂ " (343mm)	13 ¹ / ₂ " (343mm)	13 ¹ / ₂ " (343mm)
Width	17 ⁵ / ₁₆ " (440mm)	17 ⁵ / ₁₆ " (440mm)	17 ⁵ / ₁₆ " (440mm)	17 ⁵ / ₁₆ " (440mm)
Shipping Weight	16 lbs./7.3kg	16 lbs./7.3kg	19 lbs./8.6kg	19 lbs./8.6kg

* Reference Tapes: LN- MAXELL UD-XLI; CrO₂- TDK-SA; FeCr- Sony FeCr; Metal- TDK-MA

All specifications and features subject to change without notice.

harman/kardon

240 Crossways Park West, Woodbury, NY 11797-2057 516-496-3400

Printed in U.S.A. 4/82

www.hifiengine.com