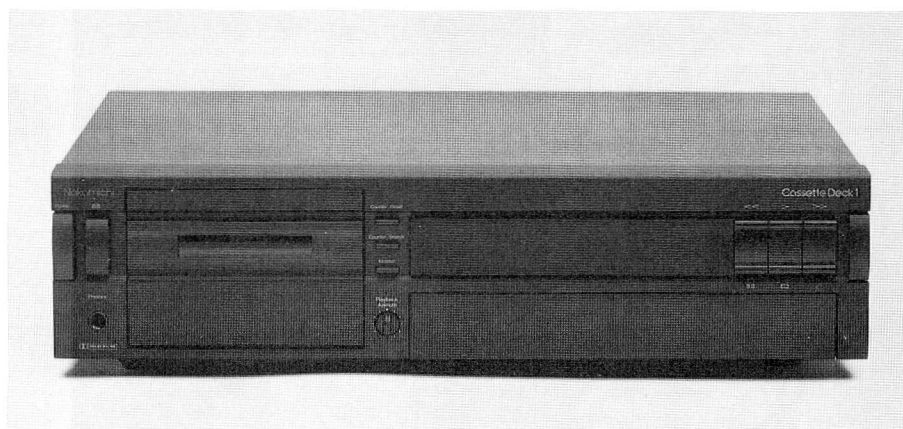


Nakamichi Cassette Deck 1

Recommended

NAKAMICHI B&W (UK) LTD, MARLBOROUGH ROAD, CHURCHILL INDUSTRIAL ESTATE, LANCING, WEST SUSSEX. TEL: (0903) 750750



This model is basically a three head variant of *Cassette Deck 2*, somewhat more exotically engineered and similarly more elaborately specified. As always with this marque, the fundamental engineering is hard to fault. It is also an attractive deck, and in most respects it is logically laid out, yet it has a peculiarly archaic quality stemming from the manual tape type selectors (in 1991!) and generally Seventies-ish blend of features. But don't be deceived.

Most of the minor controls are fitted behind a flap, including the manual tape type selectors, a fine bias adjust control, an output level control (why?) and some simple timer and search facilities. The counter is a simple numerical type with an electronic readout which is built into an excellent display whose main feature is a high resolution record level meter. As usual with Nakamichi, although Dolby B and C are included, Dolby HX Pro is not.

Test report

The *Cassette Deck 1* is equipped with a version of Nakamichi's superb diffused resonance dual capstan transport one of whose features (in common with other Nakamichis) is that it lifts the tape pressure pad away from the tape. Unusually, the deck has a discrete three head block. Others use siamesed record/replay head blocks which eliminate any possibility of azimuth drift, but the Nakamichi scheme has the benefit of reducing bias flux leakage into the play head when recording. Making a virtue from a near necessity, Nakamichi also allows replay head azimuth to be adjusted by ear with a front panel control. In this way the best can be had from tapes recorded elsewhere.

Surprisingly, given Nakamichi's reputation, some of the test results look somewhat wayward. True, the ultimate signal/noise (Type IV, three per cent THD,

400Hz) is extremely fine at 63.5dB. But although the spectrum analysis of wow and flutter is exceptionally clean, the actual level of wow and flutter is soundly bettered by some of the competition. The frequency responses also look a little ragged in some cases, and cannot be completely ironed out with the bias control.

Sound quality

This machine gets high marks, yet not entirely without equivocation. The *1* lacks the glitz and glitter of other decks in this area, and can sound positively laid back, with an apparent lack of treble presence and bass weight which came as a surprise. Yet there is an utter consistency about the Nakamichi which can separate singers from their accompanists, or individual performers in a group in a way that knows few peers. The *1* has the most un-hi-fi presentation, even compared to other Nakamichis, yet experience has shown that it can stand its own ground on matters of inherent musical value. It has the ability to display pitch and timing convincingly as well as the quality of separation and analysis, and combine it with the best of cassette or DAT machines for that matter. There are decks around that offer a sharper, cleaner presentation, but the Nakamichi's inherently excellent electronics simply allow greater access to the music.

Pre-recorded tapes can be tuned to sound as good as you'll hear them using the azimuth control.

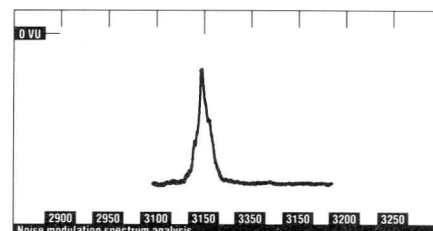
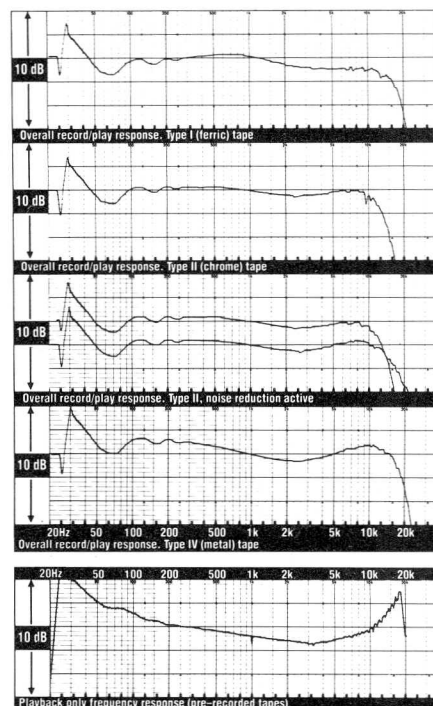
Conclusion

Recommended of course. Perhaps it is the very ordinary appearance of this deck that highlights just what an oddball it is. There can be no sound reason for manual tape switching: Nakamichi's explanation that it avoids the need for a complex

multiway switch ignores mechanical actuation of separate switches which is effectively what happens anyway. The line out level control is as unnecessary as it is unfortunate. All this speaks of a company that is a little too fond of doing things the way it has always done them. And yet. . .

TEST RESULTS

Dolby Level reading on deck's meters	n/a
Rec/replay response -3dB ref 1kHz	
IEC Type I	<20Hz - 18kHz
IEC Type II	<20Hz - 14kHz
IEC Type IV	<20Hz - 20kHz
Wow & Flutter - Peak DIN wtd/unweighted	0.09%/0.10%
Wow/Flutter - Peak DIN wtd	0.025%/0.07%
Type I signal/noise CCIR/ARM 400Hz & distortion 0VU	50.5dB/0.75%
Type II signal/noise CCIR/ARM 400Hz & distortion 0VU	57dB/0.85%
Type IV signal/noise CCIR/ARM 400Hz & distortion 0VU	54dB/0.45%
Noise Figure of Merit (Dolby level/noise Type II)	n/a
Line input sensitivity/overload	77mV/>13V
Mic input sensitivity/overload	n/a
Line output for 0dB/maximum	672mV/5.15V
IM distortion 10kHz/11kHz 0dB peak, 1kHz product	0.44%
Azimuth check R-L phase at 10kHz	50 degrees *
VU indication at IEC 0dB	1dB
Dimensions (wxhxd)	43x11x32 cm
Average wind/rewind time (C90)	2 min 24 sec
Typical Retail Price	£700
* when adjustment is altered -1/2 division clockwise, gives 0 degrees error	



AUDIO NOTE AN - SERIES LOUDSPEAKERS

I made a brief mention of the new Audio Note Loudspeakers in last month's letter, this month I shall devote more space to the speakers, as they are a very major development in transducer technology, both sonically and technically.

I spent over 10 years building up the name and reputation of the late Peter Snell designed Snell models. With these we achieved very considerable success due to their outstanding neutral performance, dynamic range etc. They were used as a main tool in the development of the Audio Innovations range of valve amplifiers, and I put considerable credit towards Peter's speakers, for the sonic performance and general insight his speakers allowed us (and still allow us for that matter) during that important stage of development. I think it is fair to say that without speakers of this quality, it would have been very difficult to fully appreciate the genuine breakthrough in sonic performance that the Audio Innovations Audio Amplifiers represented.

The "Open Window" quality that Peter's speakers pioneered, was for me so important that after his very untimely death in September 1984, at the age of 38, we set up a small project to try to understand what made his speaker designs so special. Peter was quite secretive about this himself, and little exists in writing to support any theories that one may have, so the only "documents" available, are the speakers themselves.

When it became clear that Snell were going to stop producing my favorite speakers early in 1990, we speeded this program up considerably. We had already worked out the basics, but where to go from there proved somewhat more difficult. A good contact with a drive unit manufacturer turned out to be more than helpful, with their help we got the opportunity to look at drive units in relation to the other important parameters in the design's "key cabinet" (believe me, there are more keys in there than one can comprehend, despite the seeming simplicity!).

Based on what we had learnt, we respecified the drive units, redesigned the test equipment, changed the design of the cabinet to match the properties of the new improved drive units and, more importantly, developed a revolutionary method by which we can adjust and set the speakers up in a reverberent environment. This last development is the most important, as it not only does away with the traditional test procedures, but tests the speakers, under dynamic conditions, IN THE SAME TYPE OF ENVIRONMENT THAT THEY WILL BE USED IN, and simultaneously produces pairs that are acoustically identical (all pairs are matched to within +/- 0.1db over the full bandwidth, a level of consistency which is unheard of in the audio industry).

What does this mean in reality?

I shall try to explain.

For a stereo pair of speakers to be able to reproduce performers in a free three dimensional space they must have as closely as possible the same acoustic power and frequency response. If they do not, any difference in amplitude (loudness) or frequency (speed) between the speakers will make a change in amplitude or frequency by a performer or instrument result in a shift in position of the instrument or performer in question, plus a change in their character (timbre). The speakers will therefore not be able to reproduce neither correct stereo imagery or soundstaging, nor will they reproduce the instruments with their correct individual character.

It is a little difficult to justify labelling such speakers hifi!

One thing is certain, however, and that is that Audio Note speakers are the most accurate transducers available today, when viewed by these criteria.

Which brings me to an aspect of hifi (and other expensive consumer goods as well) that are little considered today, timelessness and longevity.

Since everything in modern society advances so quickly, or so we are led to believe, there should be little or no reason, not to mention possibility, to build properties like timelessness into any product. A small historic overview is therefore useful. Let us look at some products that have survived time and new developments well and see what conclusions can be drawn from these.

The Snell Type A was first introduced in 1976 and remains to this day a sought after and relatively expensive speaker, the original Type K, J/II and E/II were introduced in 1982 and have been selling well here until a very short time ago. Similarly valve amplifiers like the Marantz 8, a Fischer SA-1000, a Leak Stereo 20 or a Leak TL10/12 are all highly sought after and priced accordingly. The lesson that can be learnt from this is interesting when you consider that very few components in hifi have a "useful" life of more than a couple or three years, before they are replaced. Try to think of a transistor amplifier of 10-15 years vintage, do you think that would be worth anything today? No.? Then why not, when a valve amplifier that is 25-30 years old is still valuable?

In my view the explanation is that any short term "trends" that a product "has" to adhere to are to the detriment of its longer term validity. As it appears to lead to products that are designed to comply with the "flavour of the month" technical parameter and not a more balanced approach.

The old Snells and the old valve amplifiers are a case in point, the fact that there are people (and quite a lot of them as well) who are willing to pay good money for products that are so old, is an indication that this selected band of products have some qualities that have remained desirable despite time and the onslaught of more and more "new technology".

In stark contrast to this is the fact that all the products that were new technology 10 years ago are themselves today virtually worthless, and the contrast between valve and transistor amplifiers is very interesting here, since transistors are known for their "longer" life, it begs the question in what way manufacturers of transistor amplifiers justify the fact that their products have such remarkably poor performance on the secondhand market, when the technology itself promises longer life and better performance, both of which seem strongly contradicted by the market itself when seen over a decade or so. Interesting is it not? I could go on and on and I shall.....

NEXT MONTH!

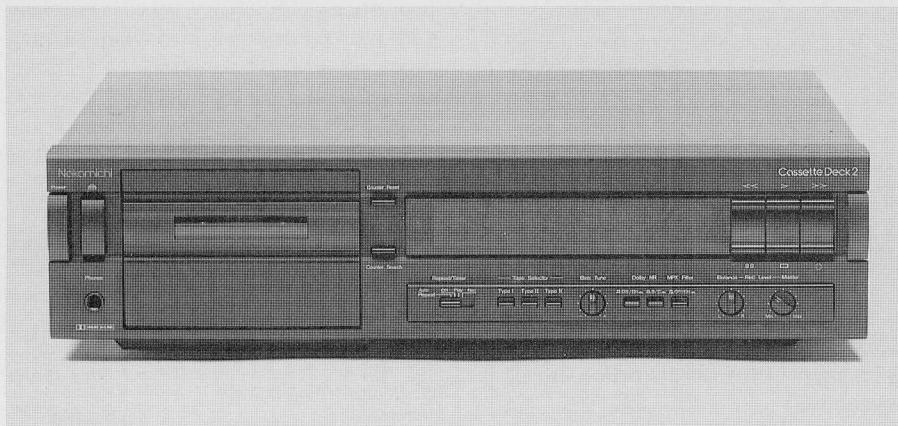
Peter Qvortrup

Audio Note Co. 0273 821371. Brighton

Nakamichi Cassette Deck 2

Recommended

NAKAMICHI B&W (UK) LTD, MARLBOROUGH ROAD, CHURCHILL INDUSTRIAL ESTATE, LANCING, WEST SUSSEX. TEL: (0903) 750750



The rather pedantic sounding moniker *Cassette Deck Two* was presumably an attempt to avoid the singularly inappropriate and perhaps misleading title *CD2*. Prepare to be confused.

£300 is cheap for a Nakamichi, so it was no surprise to discover that the *CD2* is a two-head deck at a price level where most of Nakamichi's competitors are producing more glamorous three-head machinery. The austerity message is reinforced by the decision to use manual tape group switching.

Elsewhere, the *CD2* is about par for the course. There is a bias trim pot, Dolby B and C with an MPX off switch (but no Dolby HX Pro) and an electronic tape counter with a 'zero search' key.

But it is the details you can't see that mark the *CD2* out. These range from the minor - like automatic elimination of tape slack and the near silent transport engagement - to major points like a re-engineered capstan, an improved servo, a rigid single piece chassis and increased headroom (20dB ref 0VU claims Nakamichi) in the record/play amps. There are also less tangible benefits, of which two deserve special mention. The first is separate, independent, internal L and R bias adjusters for all three tape groups. Most decks these days have a single adjustment that forces all settings to track together. The other is an unrivalled backup which guarantees indefinite servicing to the full original specification, automatic replacement of consumables like belts and pulleys and automatic updates where available.

Test Report

Wow and flutter isn't quite as low as the remarkable Pioneer *CT-757*, and the spectrum analysis shows a number of well distributed error artefacts. But

numerically, the *CD2* still figures amongst the best in the group.

The replay only frequency response shape is fairly accurate, the major anomaly being a sharp output rise in the extreme HF area, above 10kHz, with peak level at least 4dB ref 0VU at the 18kHz measuring limit. The only other very mild effect was a slight shelving up of response above 1kHz with all tapes, including the prerecorded variety. The effect is limited in amplitude to around 1dB, but as this is a wideband phenomenon, the amount of energy involved is substantial and some aural effect can be anticipated. Signs of the promised headroom can be seen in the exceptionally low IM and Type II and IV THD figures.

Sound Quality

The Nakamichi is proof - if proof be needed - that what emerges from the loudspeakers at the end of the day is not necessarily what the numbers say you are going to get.

Prerecorded material, for example, shows a trace of grit which was not expected from the measurements. But this deck also offers range and power, and a vivid sense of instrumental colour and texture in the bass and mid that is extremely rare from any cassette deck. The bass sounds a little lean and dry, and the treble is somewhat rough in feel, even taking into account the slightly exposed treble suggested in the measurements.

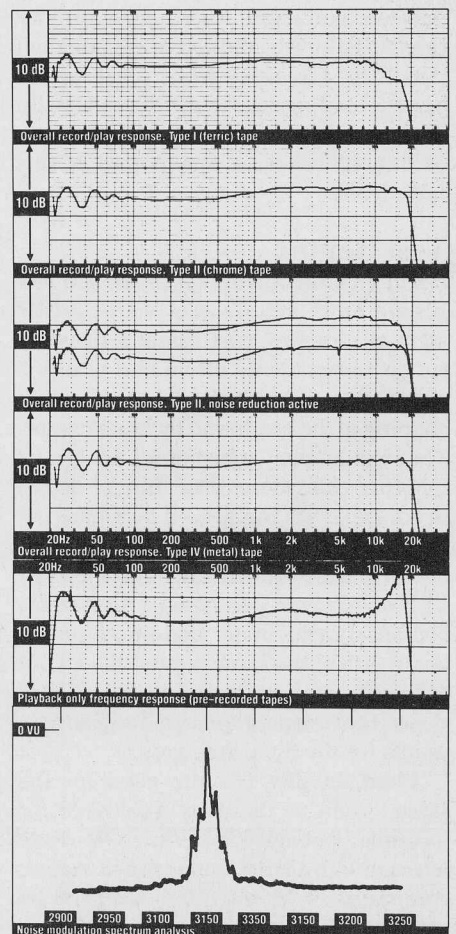
The sound has real balls, but needs the superior dynamic headroom and consistency of metal tapes to make it work at its best. It is also a good idea to avoid Dolby noise reduction. Lack of Dolby tends to exaggerate the graininess of the sound, but it also helps to retain clarity and liveliness in a way that Dolby seems unable to emulate.

Conclusion

To describe the sound as raw but real is perhaps an exaggeration on both counts, but provides a fair flavour of the beast. Not for the fainthearted, the Nakamichi is a distinctive product in this price range, but you'll have to live without the extras.

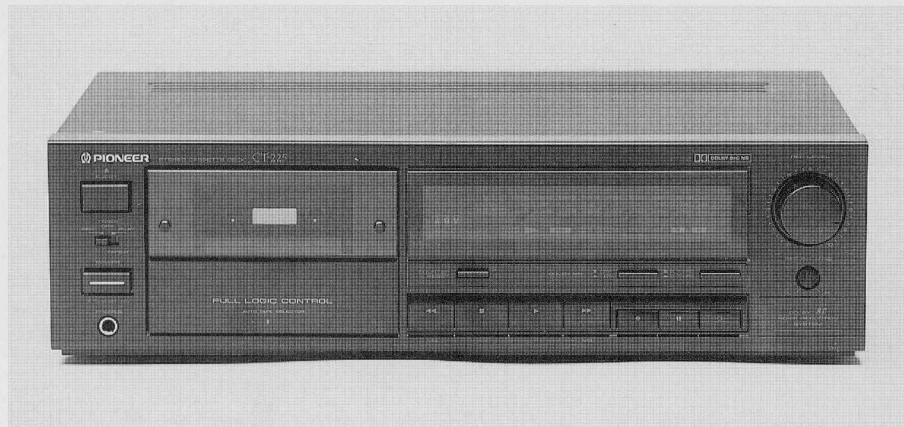
TEST RESULTS

Dolby Level reading on deck's meters	n/a
Rec/replay response -3dB ref 1kHz	
IEC Type I	<20Hz - 17kHz
IEC Type II	<20Hz - 20kHz
IEC Type IV	<20Hz - 20kHz
Wow/Flutter - Peak DIN wtd /unweighted	0.08%/0.17%
Wow/Flutter - Peak DIN wtd	0.05%/0.15%
Speed error	0.01%
Type I signal/noise CCIR/ARM 400Hz & distortion 0VU	48dB
Type II signal/noise CCIR/ARM 400Hz & distortion 0VU	54.5dB
Type IV signal/noise CCIR/ARM 400Hz & distortion 0VU	52.5dB
Noise Figure of Merit (Dolby level/noise Type II)	n/a
Line input sensitivity/overload	70mV/>13V
Mic input sensitivity/overload	n/a
Line output for 0dB/maximum	668mV/5.5V
IM distortion 10kHz/11kHz 0dB peak, 1kHz product	0.045%
Azimuth check R-L phase at 10kHz	40 degrees
VU indication at IEC 0dB	1dB
Dimensions (wxhxd)	43x10x32cm
Average wind/rewind time C90	2 min 23 sec/slow
Typical Retail Price	£300



Pioneer CT-225

PIONEER HIGH FIDELITY (GB) LTD, FIELD WAY, GREENFORD, MIDDLESEX
UB6 8UZ. TEL: (081) 575 5757



Surprisingly for a £100 cassette deck, the Pioneer CT-225 is rather well equipped. You get a recorder with Dolby B and C, timer standby (Radio 3 documentaries on Miles Davis *in absentia* and all that jazz) and a full logic controlled transport with track search capable of skipping up to 14 tracks in either direction.

The peak-hold record level meters cover 28dB in seven steps, which is more than satisfactory, and although the meter legends are unilluminated, levels of 0VU and above are picked out in red to improve intelligibility. If you're looking to see what corners have been cut (as Pioneer's competitors most surely will), you have only to look at a certain fundamental under the skin flakiness, and on the outside such details as a plastic front panel and a cassette loading door which doesn't unclip for cleaning of the head block area. None of this, however, is unexpected at this price level.

Test Report

Highlights (or lowlights) of the lab test programme include the characteristic signature of low cost cassette decks: a rough and reticent bottom end which is cured in more costly models with subtle shaping of the heads and by other means. The high frequency responses are erratic (another characteristic of budget decks, of course), with the Type II plot showing a 3dB boost at 8kHz (exaggerated by the action of Dolby processing) and the Type IV plot perversely showing a mild treble roll-off, coincidentally also amounting to about 3dB at the same point. Like all but the most expensive recorders, the CT-225 doesn't have separate internal adjustment points for the three tape groups.

Pitch stability is quite good for the price - look at the Sony TC-FX120 for example - but noise levels are well above average with all three tape groups. Again, comparison with the Sony, which is no less than 6dB quieter with TDK SA-X at an

only slightly lower distortion level, is instructive.

Sound Quality

The acid test, of course, is how well the recorder makes recordings, and the short answer is that it does so somewhat crudely. Even with metal tapes, which produce on paper what looks like a rather shy, retiring balance, the budget Pioneer sounds coarse and congested, especially when stressed with complex musical structures involving reasonable quantities of high frequencies. The Latin inspired rhythms of *La Habanera* from the album *One Second* by Yello presents an ideal example of just such a recording where the end result could do no better than parody the original - and an unkind parody at that. The complex cymbal work took the foreground for itself, and other instruments lacked presence. Stereo imagery was a particular casualty. The sense of soundstage presence wasn't so much dissipated - a common failing - as simply cluttered and confused.

Recordings made using Type II tapes predictably suffered from the boosted top end, especially with Dolby processing, which was all too necessary with virtually all types of music. Not only was the musical balance thin and toppy, there were also telltale signs of the internal spectral and tonal shifts that indicate Dolby mistracking.

Only with Type I (ferric) tapes and with prerecorded material was the deck more or less accurately set up. In fact the response shape with prerecorded material was ruler flat, a fact rewarded by a smoother, more consistent, but still rather flat performance - and still at the mercy of unusually high background noise levels. Good Type I tapes such as TDK AR made acceptable recordings within the limitations already described, and probably represent the optimum tape-to-machine match in this instance.

Conclusion

£100 is not a lot to pay, but even so, the CT-225 was a little disappointing to listen to in most cases, though it worked reasonably well with ferric tapes, and when playing music cassettes. By contrast, the facilities count is surprisingly high. Perhaps Pioneer invested just too much of the scarce resources available to the latter and not enough to the former.

TEST RESULTS

Dolby Level reading on deck's meters	+3dB
Rec/replay response -3dB ref 1kHz	
IEC Type I	60Hz - 16kHz
IEC Type II	60Hz - 16kHz
IEC Type IV	60Hz - 14kHz
Wow/Flutter - Peak DIN wtd /unweighted	0.23%/0.32%
Wow/Flutter - Peak DIN wtd	0.16%/0.31%
Speed error	+0.3%
Type I signal/noise CCIR/ARM 400Hz & distortion 0VU	47.5dB
Type II signal/noise CCIR/ARM 400Hz & distortion 0VU	1.3%
Type IV signal/noise CCIR/ARM 400Hz & distortion 0VU	52.5dB
Type I signal/noise CCIR/ARM 400Hz & distortion 0VU	0.7%
Type IV signal/noise CCIR/ARM 400Hz & distortion 0VU	53dB
Noise Figure of Merit (Dolby level/noise Type II)	55.5dB
Line input sensitivity/overload	71mV/>13V
Mic input sensitivity/overload	n/a
Line output for 0dB/maximum	525mV/2.58V
IM distortion 10kHz/11kHz 0dB peak, 1kHz product	8.6%
Azimuth check R-L phase at 10kHz	20 degrees
VU indication at IEC 0dB	3dB
Dimensions (wxhxd)	42x12x27.2cm
Average wind/rewind time (C90)	2min 35sec/very slow
Typical Retail Price	£100

