

AIWA Model 1800 Cassette Deck

MANUFACTURER'S SPECIFICATIONS

Frequency Response: 30-14,000 Hz LH tape, 30-18,000 Hz FeCr tape, 30-17,000 Hz CrO₂ tape.

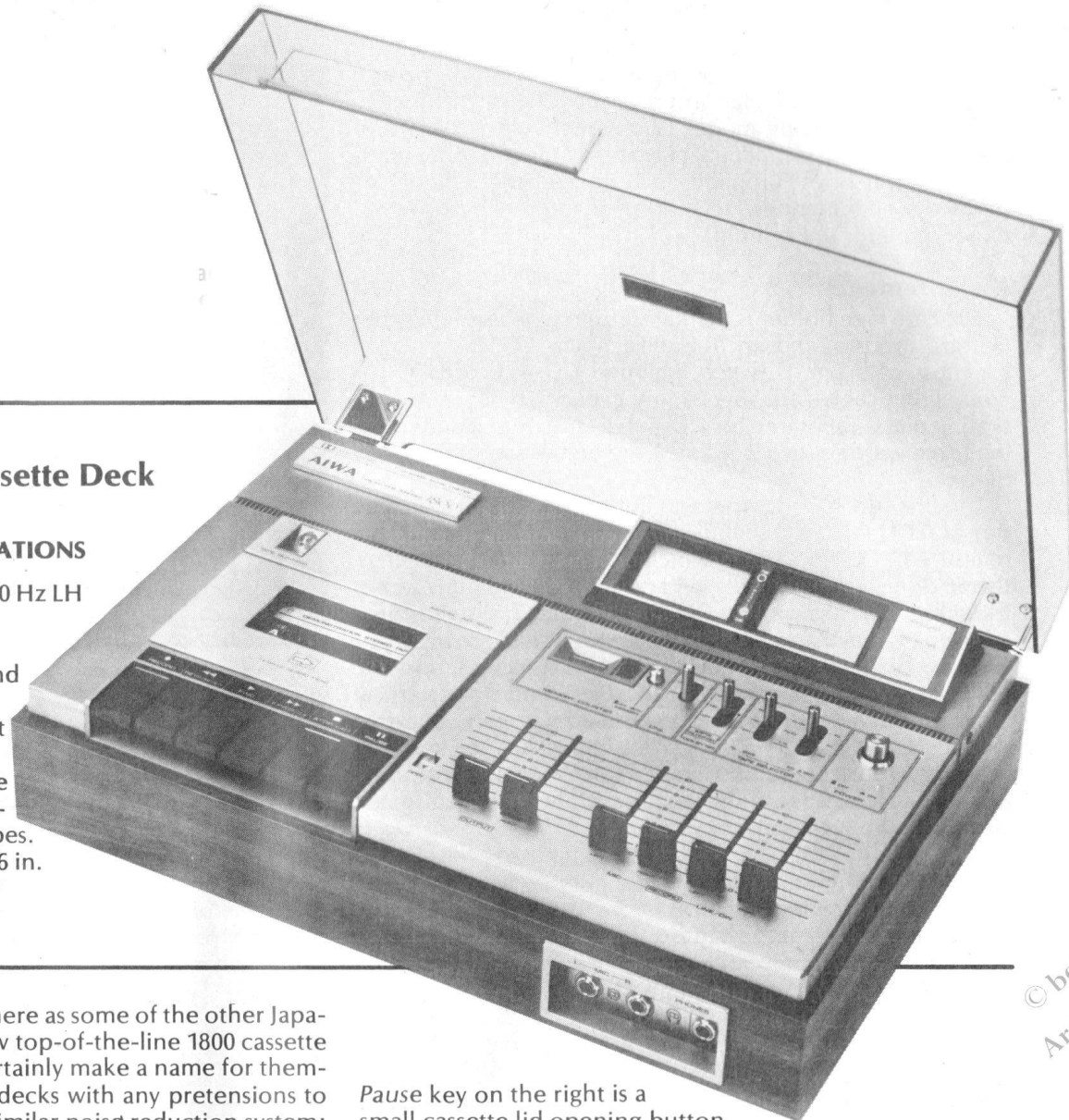
S/N Ratio: 65 dB with Dolby and DNL.

Wow and Flutter: 0.05 per cent W rms.

Features: DNL and Dolby noise reduction systems, FeCr equalization, variable bias for LH tapes.

Dimensions: 17 in. (43.2 cm) x 6 in. (15.2 cm) x 11 1/2 in. (29.5 cm).

Price: \$450.00 with dustcover.



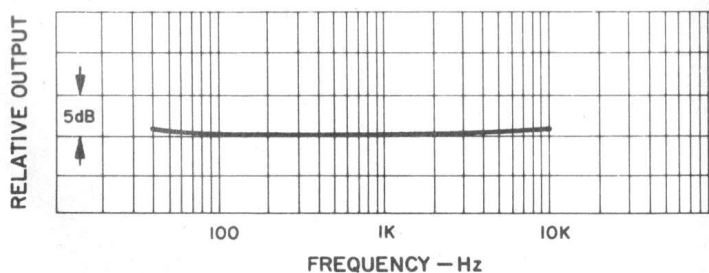
AIWA is not as well-known here as some of the other Japanese concerns, but if their new top-of-the-line 1800 cassette deck is any guide, they will certainly make a name for themselves very soon. All cassette decks with any pretensions to high fidelity have a Dolby or similar noise reduction system; but few can boast of a Dolby system *plus* a DNL circuit. It might be asked, why *two* noise reduction systems? Isn't this rather unnecessary? And isn't the Dolby sufficient on its own? But, of course, the two systems are complementary as the Dolby is a record-playback expansion compression system while the DNL only works during playback so it can be pressed into service for just about everything. Can both systems be used together—in tandem as it were? The answer is yes, although the improvement in signal to noise is not additive as we shall see later.

Let us have a look at the controls of this unusual machine. On the left hand side in front of the cassette compartment is a row of six tape control keys as follows: *Record*, *Rewind*, *Forward*, *Fast Forward*, *Stop/Eject* and *Pause*. Next to the

Pause key on the right is a small cassette lid opening button and a group of six vertical slider controls. The first two control the output levels and the second and third pair are the microphone and line input controls. Behind the sliders is the digital counter, memory button, and a set of four lever switches for DNL, Dolby, bias, and equalization. The power *On/Off* switch is over to the right, and at the rear are the two VU meters mounted at an angle with illuminated indicators for record, Dolby, DNL and CrO₂. In between the meters are two peak reading LEDs which light up at 3 and 7 dB above 0 VU. At the rear of the cassette compartment, which by the way is illuminated, is a tape run indicator lamp mounted at an angle for good visibility. The headphone and microphone jacks are located in a recessed panel on the front edge, just below the recording controls. The line input and output sockets are at the rear together with a preset control which can vary the bias by about 20 per cent. A DIN socket is also included. Now for a few words about the four lever switches: the DNL switch needs no explanation, but the Dolby switch has three positions: *Off*, *On* with a MPX filter, and *On* without the filter. The bias and equalization switches have positions for CrO₂, FeCr and LH which is called normal.

The motor is an a.c. hysteresis synchronous type, and it is coupled to a heavy flywheel weighing 448 grams (16 ounces). Styling is fairly conventional with a black and gold panel and controls. The base is finished in simulated walnut, and the 1800 comes complete with a transparent plastic dustcover, attached to hinges at the rear.

Fig. 1—Playback response with the standard test tape.



Measurements

The first measurements were made with a standard 40 Hz to 10 kHz test tape as shown in Fig. 1. Then, a record-replay response curve at two levels was made with Maxell high energy UDXL tape (see Fig. 2). The 3 dB point was at 15.8 kHz, and the low end was well-maintained without fringing effects. Next, a C-90 TDK SA tape was tried, using the CrO₂ equalization position as recommended. The results were within 0.5 dB of the Maxell, so the graph is not shown. Then a BASF CrO₂ C-90 tape was checked, and again the response was very similar (see Fig. 3) with the upper 3 dB point extended slightly, to 16.1 kHz. Various other tapes were then tried, and among those giving excellent results (without touching the pre-set bias control) was the Fuji FX-60, Maxell UD, TDK Audua, Nakamichi SX-60, and Scotch Classic. The last tape to be tested was a Ferrichrome, the Meriton FeCr-60, and it will be seen that the frequency response is extended to 20 kHz! The actual 3 dB point was 19.8 kHz but just as significant—note the increased headroom at 0 VU. Next, distortion measurements were made and are shown in Fig. 5. The high-energy tapes (Scotch Classic, TDK SA and Maxell UDXL) were almost identical, so only one curve is shown for this group. Distortion versus frequency is indicated in Fig. 6. Signal-to-noise ratio measurement was more complicated than usual owing to the different efficiencies and the use of the two noise reduction systems. These are shown in the Table 1.

Note that all the figures use the "A" weighting and are referenced to 3 per cent distortion. As mentioned earlier, don't expect to just add the Dolby and DNL figures and come up with the right answer! Having checked the Dolby

Table 1
Signal-to-Noise ratio in dB.

	Basic S/N	With DNL	With Dolby	With DNL & Dolby
Maxell UDXL	60.0	65.0	69.0	71.0
TDK SA	60.5	65.5	69.5	71.5
BASF CrO ₂	57.0	62.0	66.0	69.0
Meriton FeCr	58.0	64.0	68.0	71.0

tracking and confirmed that the maximum error was 1 dB, the erase efficiency was measured at better than 70 dB. Wow and flutter was the next test, and the combined figure was 0.04 per cent which is exceptionally good. The Dolby MPX filter was 1 dB down at 16 kHz, with the attenuation increasing to 15 dB at 19 kHz. Input signal for 0 VU was 39 mV, and the output was then between 480 and 690 mV, depending on the tape. Microphone sensitivity was 180 μV, and the signal to noise decreased by 13 dB with the input control at maximum. For most low impedance microphones, the control would be turned down somewhat so the figure in practise would be nearer 6 or 8 dB. Speed was found to be "right on the nose," and rewind time was 140 seconds for a C-90 cassette.

Listening Tests

Before making any tapes, some prerecorded tapes were played, including the new Nakamichi recording of Men-

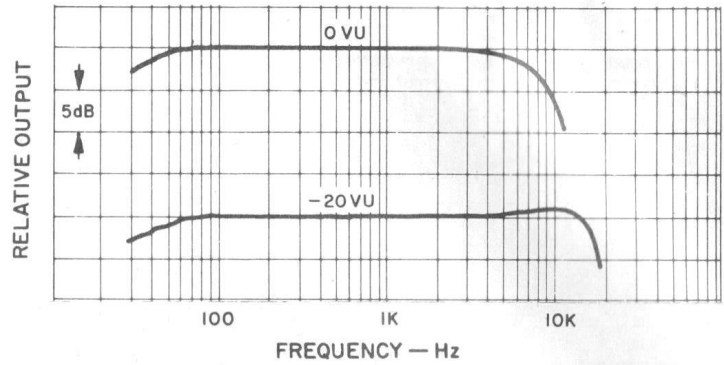


Fig. 2—Record/replay response with Maxell UDXL tape.

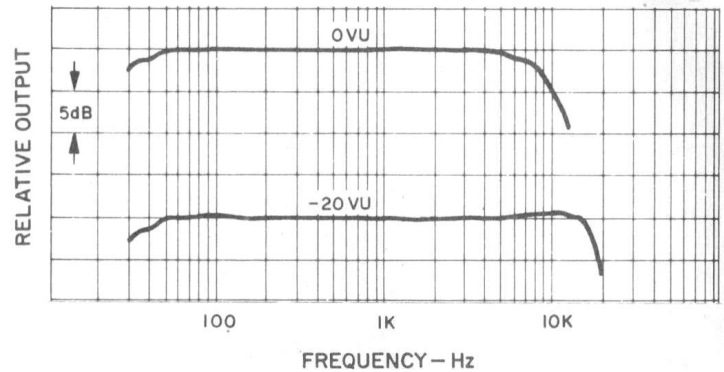


Fig. 3—Record/replay response with BASF CrO₂ tape.

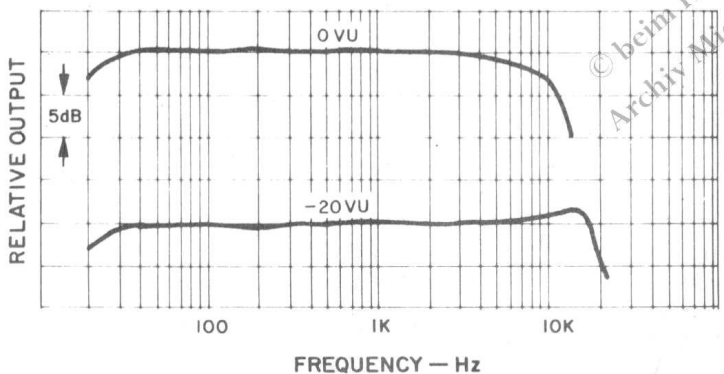


Fig. 4—Record/replay response with Meriton FeCr tape.

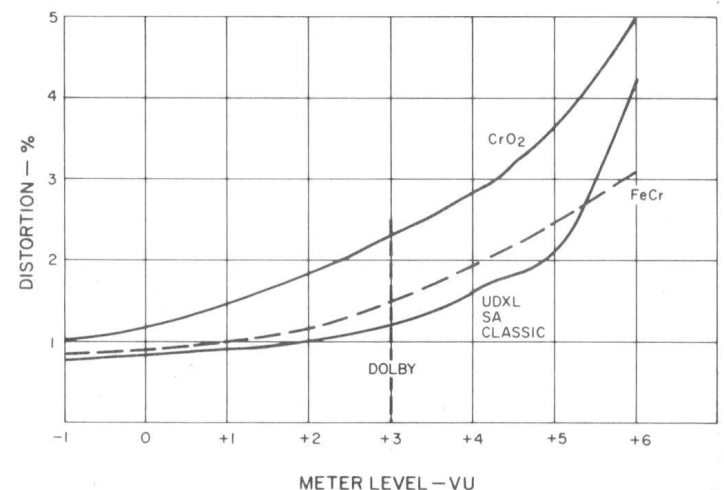


Fig. 5—THD at 1 kHz.

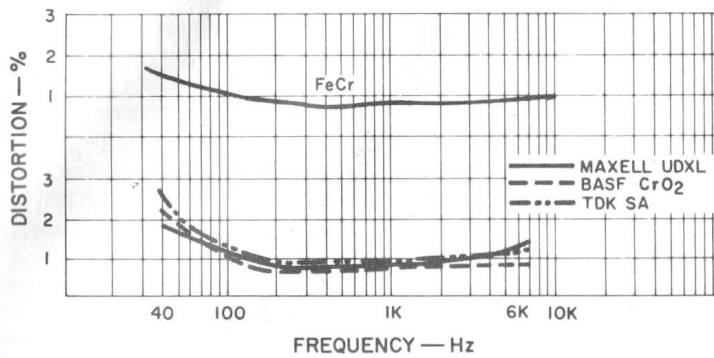


Fig. 6—Distortion vs. frequency at 0 VU.

delsohn's **Trio in D Minor** which is notable for its overall sound quality and low background noise. Next a tape was made using a spoken commentary, and here I found the twin peak indicators most useful. I would have liked some provision for a center microphone, but other than that, I have no criticisms to make. The controls all handled well, and the eject mechanism treated the cassette very, very gently, as it merely opened the compartment lid where-

upon the cassette moved slowly upwards. Aiwa calls this idea "oil damped elevation," and I have noticed something of the sort on one or two other decks. Much better than the devices which toss the cassette right out of the deck! As far as the electronics is concerned, in terms of frequency response, signal-to-noise ratio and distortion, the Aiwa 1800 is in the highest class, irrespective of price. Not only is the high-frequency response excellent, but the low end is better than average too—a tribute to good head design. The variable bias control is a refinement that will certainly appeal to the enthusiast who wants optimum results from any tape—although I must confess I only had to change the setting for one—the Scotch Master 90. However, a list of many other tapes with recommended bias settings is given in the instruction manual.

How about the DNL system? Well, it does help in reducing background noise, although the effects are not as dramatic as with the Dolby. The losses are not significant, and I imagine many people will leave the DNL switch on more or less permanently.

Summing up: the Aiwa 1800 is not particularly cheap, at about \$450, but it does offer excellent performance and a lot of extras for the money.

George W. Tillett

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