

Tandberg's Unique Cassette Deck

The Equipment: Tandberg TCD-310, a Dolby cassette deck in metal case with wood ends. Dimensions: 16 7/8 by 4 1/8 by 9 1/16 inches. Price: \$450. Warranty: two years parts and labor. Manufacturer: Tandberg Radiofabrikk, Norway; U.S. importer: Tandberg of America, Inc., Labriola Ct., Armonk, N.Y. 10504.

Comment: It always is something of an adventure to report on Tandberg equipment, because the company consistently finds ways of viewing design problems through eyes unblinded by past solutions. The TCD-310, like its immediate and very similar predecessor, the TCD-300, is no exception.

The top panel (or front panel; the unit can be stood vertically) is unconventional in having the cassette well, which runs across the unit rather than lengthwise, at the right and the controls at the left. The well orientation prevents the cassette from ejecting onto the floor when the deck is used vertically. Far more important, the three-motor transport below the well is controlled—via a comprehensive “logic” system for gentle tape handling and prevention of unintentional misuse—by a solenoid rather than the common mechanical linkage, and it features an unusually heavy (and therefore rigid) head block and dual-capstan drive.

The metering of the TCD-310, like that on other recent Tandberg decks, reads peak recording values. For a full discussion of the important advantages of this type of metering, see our report on the Tandberg 9000X, October 1973. Suffice it to say that while we find peak-reading meters important for good recordings in consumer equipment, the relatively restricted headroom of cassette tapes makes peak metering even more important in this format.

In front of the meters are what appear to be seven

pushbuttons: four dummies and three that function. (Could it be that Tandberg is allowing for future developments?) At the left is a mono button that will add together the inputs from both channels and record them equally on both tracks of the stereo pair. A mono recording can be made on both tracks (for best possible signal-to-noise ratio) even when the signal is present only at one of the input jacks. And this button can be used to mix a mike signal in one channel with a line signal in the other (the separate faders for each channel controlling the inputs separately) for a mono recording. At the right are switches for Dolby (on/off) and tape (ferric/chrome).

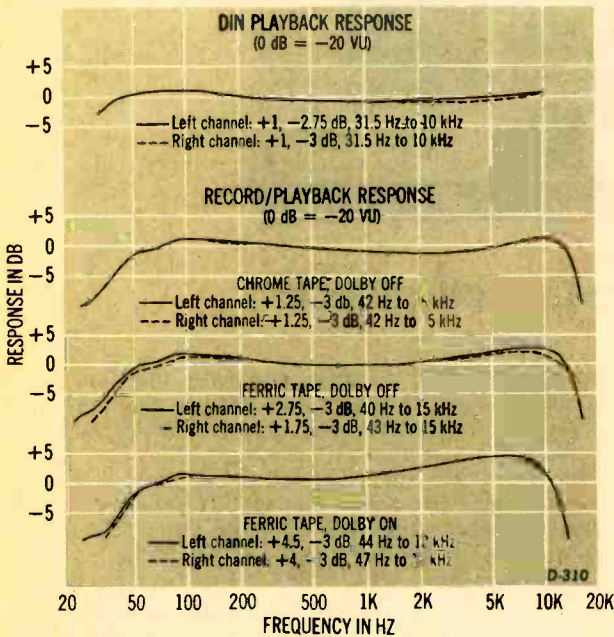
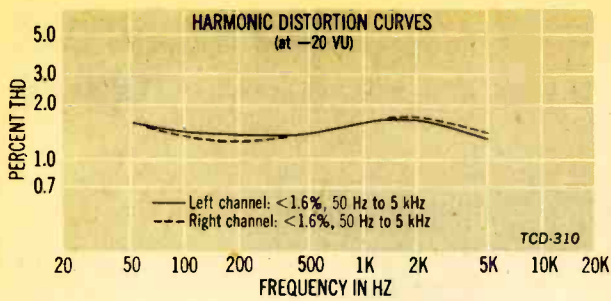
The transport controls at the extreme front are similar to conventional “piano-key” controls in appearance but somewhat different in operation. First comes a power on/off switch. Then there are controls for rewind, stop, and wind. The next control is an oversize lever for play; next to it is a recording lever. To the right, beyond the microphone jack, are similar levers for pause and eject.

There is no conventional play/record interlock; you need press only the recording lever to switch the deck into that mode, but there *is* an interlock to prevent you from doing so unless the deck is in pause. This feature doubtless will trigger a certain amount of dispute, as it did when Ferrograph omitted the conventional interlock on its open-reel Series 7. But—again, as with the Series 7—we never found ourselves recording accidentally in actual use. In working with the deck for some time we have concluded that you need harbor no fears on this score and that the pause interlock actually is more efficient in operation than the play interlock on many other models.

We do have one minor complaint about the switching, however: Only the recording lever triggers a warning

REPORT POLICY

Equipment reports are based on laboratory measurements and controlled listening tests. Unless otherwise noted, test data and measurements are obtained by CBS Laboratories, Stamford, Connecticut, a division of Columbia Broadcasting System, Inc., one of the nation's leading research organizations. The choice of equipment to be tested rests with the editors of HIGH FIDELITY. Manufacturers are not permitted to read reports in advance of publication, and no report, or portion thereof, may be reproduced for any purpose or in any form without written permission of the publisher. All reports should be construed as applying to the specific samples tested; neither HIGH FIDELITY nor CBS Laboratories assumes responsibility for product performance or quality.



light. The mono, Dolby, and chrome buttons, being black against a black background, require that you either remember or specifically check their positions. A casual glance at the unit is not enough to tell you how you are set up.

This point, which might be passed over almost without comment in another product, stands out in the one design element about which Tandberg seems to have thought in purely cosmetic terms. Its otherwise incisive approach is evident, for example, in the mike preamp circuitry, which—like that in the 9000X—will handle mikes rated at anywhere from 150 to 700 ohms and has unusual dynamic range. Both mike and line inputs benefit from a circuit like that in the 9000X, which uses a feedback gain system to achieve an astonishing combination of high sensitivity and low noise.

Similarly, the hub motors are controlled by each other (the braking motor develops a back voltage that is used to determine the drive voltage, and therefore the speed, of the driven motor); the automatic stop (which operates in all transport modes) is triggered by a motor-noise-sensing circuit that is unique in our experience; and the head-plate solenoid triggers a moment *after* the motors have been turned on so slack is removed from the tape before transport begins. (The start action is almost instantaneous nonetheless, while that of the pause control *is* instantaneous when the motor already

Tandberg TCD-310 Additional Data

Speed accuracy	0.33% fast at 105, 120, and 127 VAC	
Wow and flutter	playback: 0.08% record/play: 0.10%	
Rewind time (C-60 cassette)	33 sec.	
Fast-forward time (same cassette)	33 sec.	
S/N ratio (re DIN 0 VU; Dolby off)		
playback	L ch: 56 dB	R ch: 56 dB
record/play	L ch: 53 dB	R ch: 53 dB
Erase (333 Hz at normal level)	65 dB	
Crosstalk (at 333 Hz)		
record left, play right	33 dB	
record right, play left	34.5 dB	
Sensitivity (re DIN 0 VU)		
line	L ch: 25.8 mV	R ch: 25.8 mV
mike	L ch: 0.2 mV	R ch: 0.2 mV
Meter action (re DIN 0 VU)		
	L ch: 1/4 dB low	R ch: 1 dB low
IM distortion (record/play, -10 VU)		
	L ch: 5.5%	R ch: 5.5%
Maximum output (line, 0 VU)		
	L ch: 0.777 V	R ch: 0.775 V

is running.) All this adds up to sophisticated and creative engineering.

American owners may think otherwise after studying the owner's manual, which makes repeated reference to your "radio" (not receiver or amplifier) connections. This—and the manual's emphasis on the DIN input/output socket at the back, rather than the (to us) conventional pin-jack pairs on the same panel—must be accepted simply as reflecting European habits.

Though Tandberg's published data on the TCD-310 apparently are based on the use of its own LH ferric cassette tapes, Maxell UD was supplied with the test samples and was used for most of our testing. While we can't fault performance with UD on aural grounds, measured record/play response with it does show some tendency (further exaggerated to some extent by Dolby tracking) toward a peak at the high end and therefore does not fall within Tandberg ± 2 -dB specs for the LH. A slightly less "hot" tape than UD should show less tendency toward this peak, though by the same token it may not deliver quite the high-frequency response. Chrome tapes are, of course, very similar to each other; ours produced fine results on the Tandberg both in the lab and in the listening room.

Though the remaining data also are excellent, they don't suggest the extra-special quality of the deck, which can be sensed in using it or understood by considering its engineering. If we had to single out a specific element in the design that typifies this quality, it would have to be the metering system. Both because it is of the peak-reading type and because it measures signal values *after* recording pre-emphasis has been applied, it offers the user exceptional precision in "placing" his recordings within the tape's capabilities and therefore in making the most of the recorder's performance indicated by CBS Labs' data.

CIRCLE 142 ON READER-SERVICE CARD