3

LUXMAN DX-103 COMPACT DISC PLAYER

Manufacturer's Specifications
Frequency Response: 5 Hz to 20 kHz, ±0.5 dB.
Dynamic Range: Greater than 90 dB.
Total Harmonic Distortion: Less than 0.007% at 1 kHz.
Channel Separation: 90 dB.
Output Level: Variable, 0 to 5.0 V; fixed, 2.0 V.
Number of Programmable Selections: 16.
Wow and Flutter: Below measurable limits.
Dimensions: 16½ in. (41.9 cm) W × 3⅜ in. (8.57 cm) H × 13¼ in. (33.7 cm) D.
Weight: 15 lbs. (6.8 kg).
Price: $999.95.

Company Address: 19145 Gramercy Place, Torrance, Cal. 90501.
For literature, circle No. 92

I have prided myself in the past with being able to figure out which of the prime suppliers of CD players was manufacturing which players for some of the smaller companies who don't quite have the capability to produce these complex machines on their own. I must confess that in this case, I wasn't able to figure out with whom Luxman had contracted to produce the DX-103. As you might expect with Luxman, they insisted upon having the CD player produced for them be as distinctly different in layout from other CD players as Luxman amplifiers, tuners and other products are from those of their competitors. As a result, the DX-103 turns out to be somewhat different from the norm, both in features and in layout, if not in measured performance.

The DX-103 has one of the fastest access times I have ever measured, locating a desired "track" or selection on a disc in a matter of 2 to 3 S. Up to 16 music selections can be

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stored in its computer memory for playback in any selected order. A "Repeat" control allows an entire disc or the selections stored in memory to be repeated. Light-touch pushbuttons handle all control functions, and an optional wireless remote control (Model RC-3) can start, stop or pause the player and can move the laser pickup in fast forward or reverse or skip it ahead or back. To help you remember what's on the disc you've chosen to play, a "Scan" feature plays the first 10 S of each selection on the disc, in both the normal mode (when playing through an entire disc) or in the memory mode (when playing only selected tracks stored in the player's memory).

Control Layout

The control layout of the DX-103, as mentioned above, is unusual. Oversized touch buttons near the disc-loading tray handle play, pause, fast-forward and fast-reverse functions, with illuminated indicators on the "Play" and "Pause" buttons. The "Power" and timer-start switches, stereo headphone jack and headphone level control (which also adjusts level from the rear-panel variable-output jacks) are to the left of and below the disc drawer. "Repeat," "Scan," "Disc" and "Data" indicator lights illuminate when the corresponding buttons or functions are operated. The "Disc" indicator flickers when power is first turned on or when the disc tray is sliding in or out; it stays on when a disc is properly in place. The "Data" light flickers when the disc's "Table of Contents" is being read; when that's been completed, this indicator stays on.

The display area to the right of the tray shows track number and index number of a disc, plus time elapsed from the track's beginning. This display also shows total time played on the disc or, at the touch of a toggling button, time remaining on the disc. A memory-play indicator at the extreme right of the panel illuminates when a selection recalled from memory is being played. Just below the display area are the "Skip" buttons, which shift the laser pickup to the start of the next or the current track. Ten small, numbered keys in this area of the panel are used to select tracks for playback, either during normal play or in the memory-play modes. By using these numbered keys, it is possible to select not only a track (selection) but an index number within a given selection, if the disc being played has such subdivisions encoded in it.

The lower row of touch buttons on the front panel include "Memory Call," memory "Clear," "Memory Write" (for storing desired selections to be played), "Repeat," "Scan" (described earlier), and "Time" (which causes the display to toggle between "time played" and "time remaining" on the disc being played). The rear panel of the Luxman DX-103 has two sets of output jacks: One is at fixed level, and the other varies in output level, set by the front-panel headphone level control.

Measurements

Figure 1 shows frequency response for both the left and right channels of the DX-103. The vertical scale is 2 dB per division, and the sweep, from left to right, extends from 20 Hz to 20 kHz. Frequency response for the Luxman DX-103 was the most uniform I have ever measured for any CD

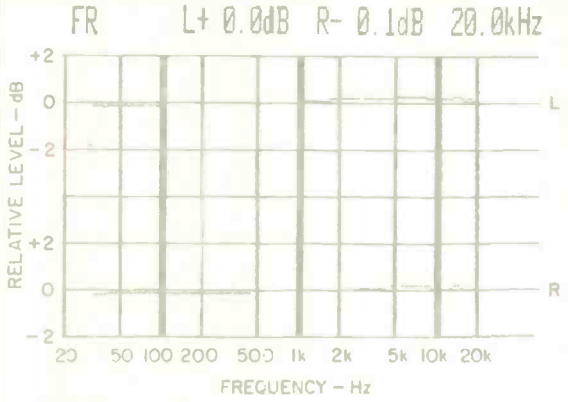

Fig. 1—Frequency response, left (top) and right channels.

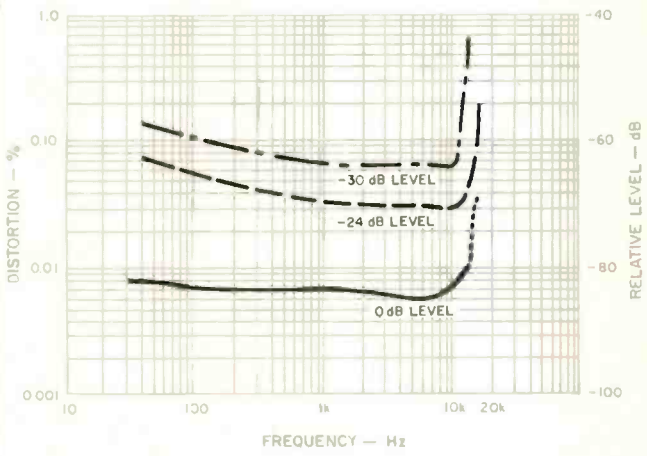

Fig. 2—THD vs. frequency at three output levels.

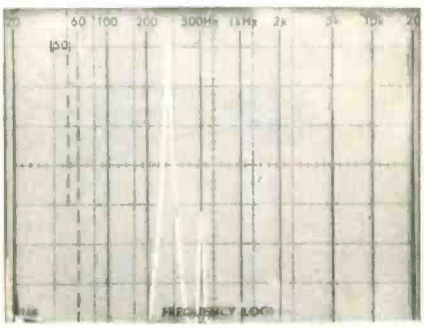

Fig. 3—Spectrum analysis of 20-kHz test signal (large spike) shows inaudible beat tone at 24.1 kHz (small spike), 44 dB lower.

Sound quality is above reproach, thanks to Luxman's highly regarded Duo-Beta feedback circuitry in the critical, final analog stages.

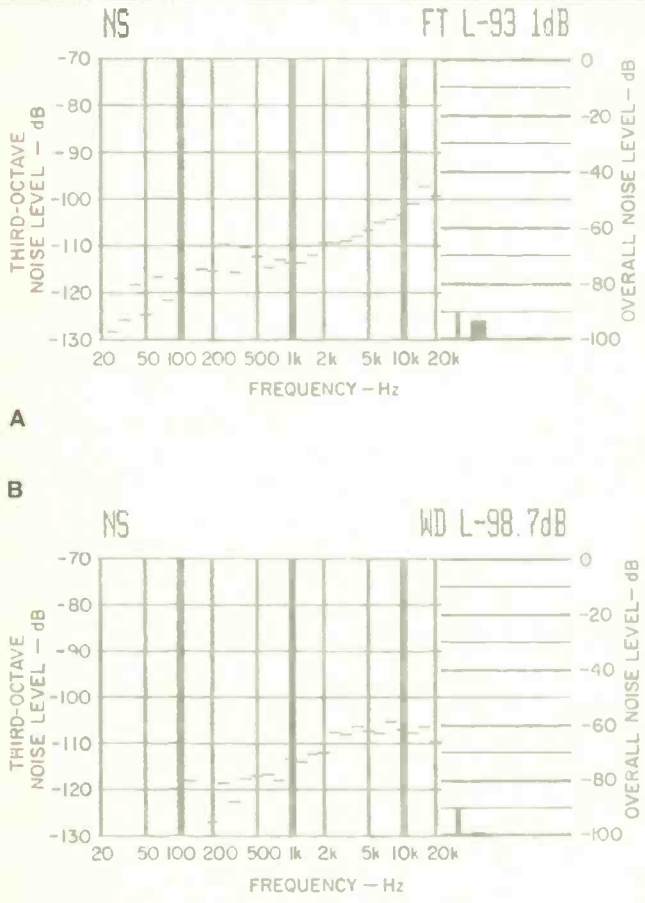

Fig. 4—S/N analysis, both unweighted (A) and A-weighted (B).

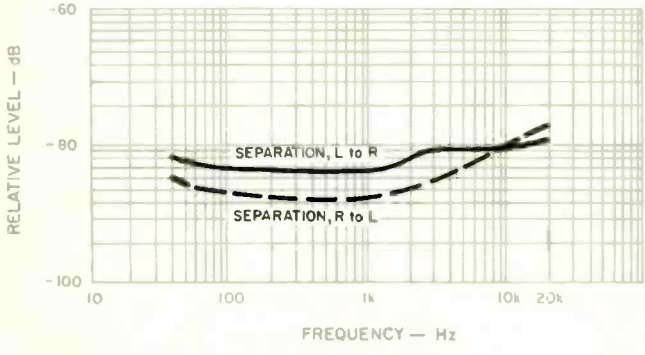

Fig. 5—Separation vs. frequency.

player, varying by no more than 0.1 dB from 20 Hz to 20 kHz. Harmonic distortion for maximum output varied from 0.005% to around 0.008%, depending upon the test frequency being measured. A plot of THD versus frequency up to around 10 kHz, measured at various recorded levels, is shown in Fig. 2. Above that frequency, I encountered the now-familiar rise in apparent THD. As can be seen on the spectrum analyzer (Fig. 3), however, this rise is not actually an increase in THD but rather is caused by a beat frequency occurring outside the range of hearing, above 20 kHz. In Fig. 3, a test tone of 20 kHz was used (the tall spike in the 'scope photo), and to the right of this primary tone can be seen a "beat" tone at approximately 24.1 kHz (interaction between the 44.1-kHz sampling rate and the 20-kHz tone being reproduced). This secondary tone was more than 40 dB below the desired 20-kHz tone and would therefore not be likely to cause any problems with wide-band amplifiers and wide-range tweeters.

Unweighted signal-to-noise ratio measured 93.1 dB (Fig. 4A); with an A-weighting filter included in the measurement, signal-to-noise ratio increased to 98.7 dB (Fig. 4B). At maximum recorded level, IM distortion measured 0.005%, increasing to 0.025% at −20 dB recorded level. Linearity was accurate to within 0.2 dB down to −80 dB. Stereo separation (Fig. 5) ranged from 80 dB at the low- and high-frequency extremes to around 87 dB at mid-frequencies.

Square-wave reproduction of a 1-kHz digitally generated square wave signal (Fig. 6) was typical of that encountered with CD players which use multi-pole, steep, analog filters following digital-to-analog conversion. The same was true of the reproduction of a digitally generated unit-pulse signal, as shown in the 'scope photo of Fig. 7. Negligible phase shift between a left-channel, 200-Hz test signal and a right-channel, 2-kHz test signal was observed in the 'scope photo of Fig. 8, though greater phase shift would have been evident at higher test frequencies. Perfect phase linearity in this test is represented by a positive crossing of the zero axis at the same time for both test frequencies.

The Luxman DX-103 played completely through my special "defects" disc without ever mistracking or muting. This means that if you had a disc with an opaque scratch as long as 900 microns (slightly less than 1 mm), the player would ignore it completely. Similarly, surface dust particles as great as 800 microns in diameter would also be ignored by this excellent-tracking machine. The player was also quite acceptably resistant to external shock or vibration, remaining "on track" when I tapped lightly on its top and sides during the listening tests.

Use and Listening Tests

Despite the relatively great number of features found on the front panel of the DX-103, I found the player easy to use. The sample I tested was shipped without an owner's manual (that situation should, of course, be corrected by the time you read this), yet I was able to figure out how to program the machine for memory playback of chosen tracks and how to get all the other features to work properly.

The Luxman DX-103 puts out an even greater signal voltage than the already-high voltage levels produced by most other CD players. I can understand the need for high

Even without an owner's manual, I could easily figure out the DX-103's many features, including how to program it.

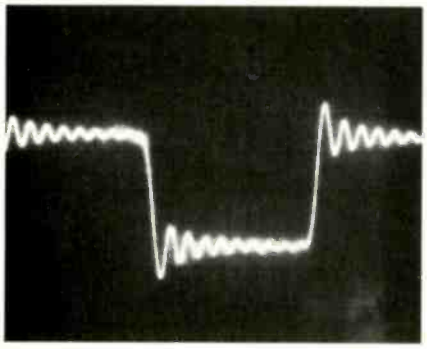

Fig. 6— Square-wave reproduction, 1 kHz.

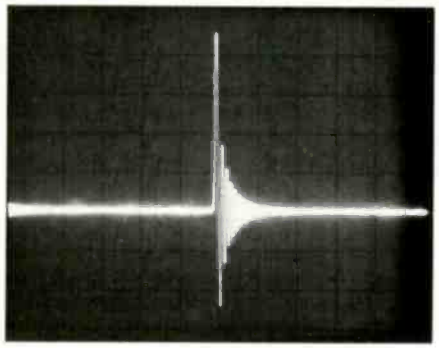

Fig. 7— Single-pulse test.

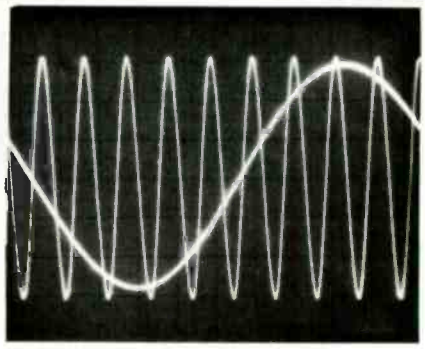

Fig. 8— Phase error check using 200-Hz and 2-kHz tones; see text.

output levels from CD players; their makers don't want the amplifiers with which they are used to become limiting factors as far as noise floor and hum levels are concerned. If CD players put out only as much voltage as tuners or analog tape decks, you might find yourself turning up amplifier volume levels (to be able to hear lowest-level sounds from CDs) to the point where residual hum and transistor hiss from the amplifier itself would become apparent. By providing a high output voltage (2 V or more, in most cases), the makers of CDs insure against such an occurrence. Just the same, the Luxman DX-103 can put out a whopping 5.0 V via its variable output jacks. If your preamplifier (or the high-level inputs to your integrated amplifier or receiver) can't handle that much input voltage without overloading its first stage, you had best switch to the DX-103's fixed outputs (which deliver a maximum of 2.0 V) or turn down the front-panel gain control that sets the player's headphone and variable-output levels.

As for the sound quality delivered by the Luxman DX-103, it is beyond reproach. Luxman has taken the trouble to incorporate their highly regarded "Duo-Beta" feedback circuitry in the final, analog stages which precede the outputs of any CD player (the output signal, after all, is analog, not digital, or we couldn't feed it to our amplifiers). Many have suggested that the chief differences between the sounds produced by different players may well be caused by differences in those final, analog stages. Here, digital signals have been converted back to analog signals and must be amplified by analog audio circuitry much as they would be in any audio component. It is in this analog area that Luxman equipment has always been outstanding, and the DX-103 is no less so. *Leonard Feldman*