

Product Review

Thorens TD 295 MK III

Reviewed by Charles Hansen

Thorens Export Co. Ltd., IM Junkholz 44 • CH-4303, Kaiseraugst-Basel, Switzerland, phone: ++41 (0)61 813 03 36 • FAX: ++41 (0)61 813 03 39, www.thorens.ch (info@thorens.ch), \$899, warranty 2 years. Supplied by Triam Electronics, Inc., 5816 Highway K, Waunakee, WI 53597, 608-850-3600. Dimensions: 435mm W x 358mm D x 145mm H (dust cover closed), weight: 8.5kg.

The TD 295 Mk III is a two-speed belt-driven turntable with a low voltage motor. The TP 42 tonearm is supplied "plug and play ready" with an Ortofon OMB 10 cartridge, and will accept any cartridge with standard ½" mounting holes. The upper surface of the turntable base is available in three colors: black, mahogany, or anis wood, all with an elegant high-gloss multi-layer "piano" finish (*Photo 1*). The dust cover sits on two pivoting posts at the rear of the base.

CONSTRUCTION

The motor, platter, and the tonearm assembly are all solidly mounted to the upper section of the base assembly. Four sandwich layers of MDF make up the lower section of the base. The base assembly sits on four elastomer cones with felt-bottomed plastic feet.

The 15cm inner platter is die-molded from a rigid but lightweight fiber material and has an integral spindle. The outer rim of the inner platter is belt driven from the motor (*Photo 2*). The turntable spindle sits on a robust Thorens Safeguard™ ball bearing. The 30cm 2.3kg main platter is zinc alloy and is dynamically balanced. It sits on top of the inner platter and provides the mass inertia to ensure that vibrations are absorbed, and motor speed fluctuations and torque pulses are kept in check. A felt mat is provided for the platter playing surface.

A 15V AC 0.19A wall adapter that plugs into a 5.5mm jack on the rear of



PHOTO 1: TD 295 MK III front view.

the turntable powers the 10-pole two-speed synchronous motor. The adapter feeds a built-in electronic oscillator that provides for either 33⅓ or 45 rpm operation, selected by a rotary switch on the left side of the base. A 45 rpm spindle adapter is provided. In the center stop position, the electronic controller applies dynamic braking to the motor windings to rapidly bring the turntable to a halt and hold it in position.

A push-button on-off switch sits to the right of the speed selector switch. In the off mode, the motor voltage is disengaged, so you can manually rotate the turntable. An optical sensor silently shuts off the motor when the tonearm reaches the lead-out grooves of a record. This optoelectronic LED sensor does not mechanically load the tonearm as would a micro-switch auto-stop sensor.

TONEARM AND CARTRIDGE

The TP 42 tonearm is

a straight hollow metal tube with an effective length of 229mm. The cartridge is mounted with a 25° offset and 18.8mm overhang. The tonearm is supported by two concentric gimbal needle bearings. The counterweight has an elastomer isolation insert, and threads onto the counterweight shaft for tracking force (TF) adjustments. The tonearm lift/cueing lever has a well-damped action that sets the stylus gently on the record.

Anti-skating is implemented by means of a small cylindrical weight.

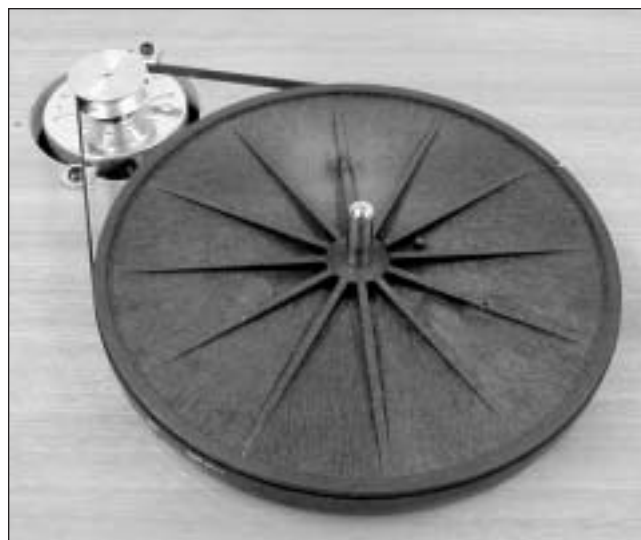


PHOTO 2: TD 295 MK III motor and inner platter belt drive.

You place its thin monofilament line in one of three notches in the anti-skating post at the rear of the tonearm. This is best done with tweezers. The weight then loops through a wire support arm that directs the monofilament line away from the tonearm and allows the weight to hang vertically above the base. Notch 1 is used for the OMB 10.

The tonearm is hard-wired to a 1m pair of shielded interconnects with gold-plated RCA phono connectors. An integral turntable ground wire is included to allow you to ground the TD 295 MK III to your phono preamp chassis. The tonearm wiring uses litz wire from the cartridge clips to the phono interconnects. Cable capacitance is listed as 160pF.

The standard Ortofon OMB 10 cartridge is pre-mounted to the tonearm, with VTA pre-adjusted at the factory. The OMB 10 has an elliptical diamond stylus with 8/18 μ m radii. Output voltage is 4mV at 5cm/s, 1kHz. The cartridge specs are given in *Table 1*.

If you choose to install a different cartridge, Thorens supplies a cardboard alignment protractor that you set onto the platter spindle. The pattern has reference points for 13° and 25° offsets that allow you to adjust the cartridge mounting screws so that the stylus-to-pivot and cartridge/headshell alignment is in accordance with specified dimensions.

Tracking force is very easy to set up, even without a stylus force gauge. You remove the stylus guard, and adjust the counterweight so the cartridge just floats at the record playing level. Then you hold the counterweight in place

and turn the force dial ring until the top of the scale reads zero.

The TF ring is graduated from 0 to 30, for 0-30mN (milli-newtons) force. Finally, you turn the counterweight to the recommended TF reading (1.5gm for the Ortofon). When I checked the TF with my stylus force gauge, it read 1.5gm, so the counterweight scale appears to be sufficiently accurate.

Unfortunately, the 8-page owner's manual mixes grams and mN force without providing any conversion factor. The TF is given in gm, while the anti-skating reference is mN. Since 1gm = 9.8066mN, if you use 1gm = 10mN you will be close enough. While the manual is generally quite thorough in describing assembly and setup, it makes no mention of installing the main platter. It sits on the inner platter and requires no further alignment (there is no positive engagement between platters).

LISTENING TESTS

I used a number of jazz, pop, and classical music LPs for my listening audition. I had the Hagerman Bugle and DacT CT 100 phono preamps on hand for testing,

which I used with a passive volume control. I also used the phono stage in my own control preamp (*Audio Electronics* 6/97, p. 8). The power amplifier is a Parasound HCA-1000A power amp. Loudspeakers are NHT SuperOnes and an SW2P subwoofer. After some time with each preamp, I decided on the Hagerman Bugle in conjunction with the passive volume control.

The Thorens table and Ortofon cartridge had no trouble negotiating the Shure Audio Obstacle Course test LP, or the high velocity tracks on the Stereo Review SR12 Stereo Test Record. There was no evidence of rumble on the unmodulated test record "silent" tracks.

Massed strings and choral voices were clear and well-defined. I would classify the Ortofon cartridge tonal balance as neutral, with an excellent midrange. Bass response was solid and well extended, so much so that it accentuated any low-level rumble I found recorded on certain LPs. If your phono preamp permits, I suggest engaging the 1380 μ s turnover filter when you encounter such recordings.

TABLE 1
ORTOFON OMB 10 CARTRIDGE
SPECIFICATIONS

Output voltage	4mV at 5cm/s, 1kHz
Channel balance	1.5dB at 1kHz
Channel separation	22dB at 1kHz, 15dB at 15kHz
Frequency response	20–20kHz, +3/–1dB 20–24kHz, \pm 3dB
FIM distortion	<1%, 1.5gm TF, DIN 45.542
Tracking ability	70 μ m, 315Hz, 1.5gm TF
Compliance, lateral	25 μ m/mN
Stylus	Elliptical, 8/18 μ m radii
Equivalent stylus tip mass	0.5gm
Tracking force range	1.25–1.75gm
Vertical tracking angle	20°
DC resistance	1k Ω
Inductance	580mH
Recommended load	47k Ω , 200–400pF
Cartridge weight	5gm

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The turntable itself was completely free of rumble, flutter, and wow. It was quite insensitive to mechanical shock applied to the turntable shelf of my equipment rack. The elastomer feet and the dense mass of the base effectively absorbed vibrations and the air waves from the subwoofer before they reached the tonearm.

The TD 295 MK III brought out all the fine details in instruments such as brushed cymbals, triangles, acoustic guitar, strings, and the woody tone of the acoustic bass. Separation between instruments was very good and the soundstage was wide and stable.

After my extended playing interval, the AC adapter transformer was only slightly warm to the touch.

MEASUREMENTS

I used two test records: Stereo Review's SR12 Stereo Test Record (1969) and Hi-Fi News & Record Review's Test Record (HFN-001, 1996). I used the DaCT CT 100 phono preamp for measurements due to its versatile cartridge load switching and selectable EQ time constants. I set the CT 100 for 47k Ω /200pF load and flat

(3-point) RIAA response.

The frequency response for the TD 295 MK III is shown in *Fig. 1*, measured at the CT 100 phono preamp output track on the SR12 test record. The overall response was determined by measuring the output voltage for the 19 warble tracks covering 20kHz down to 20Hz.

HF response rose at each end of the audio spectrum, but remained within the +3/-1dB specification for the OMB 10. The DaCT CT 100 has an optional 3.18 μ s (50kHz) rolloff time constant switch that would level off the HF response. This time constant is standard in the Hagerman Bugle.

Channel separation for the six test tracks is shown in *Table 2*. Results were essentially the same for the R-L and L-R tests. Ortofon specifies -22dB for the OMB 10 at 1kHz.

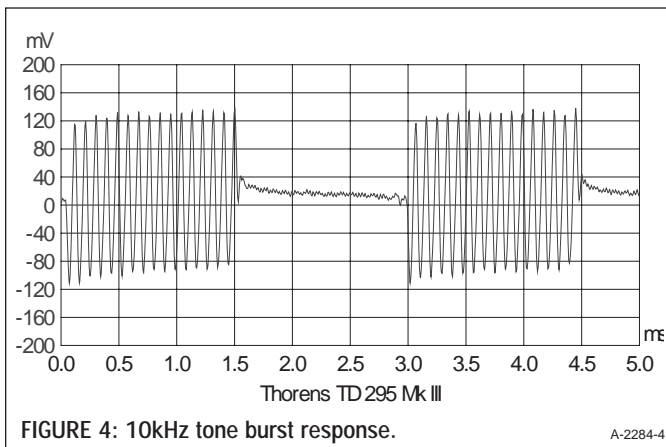
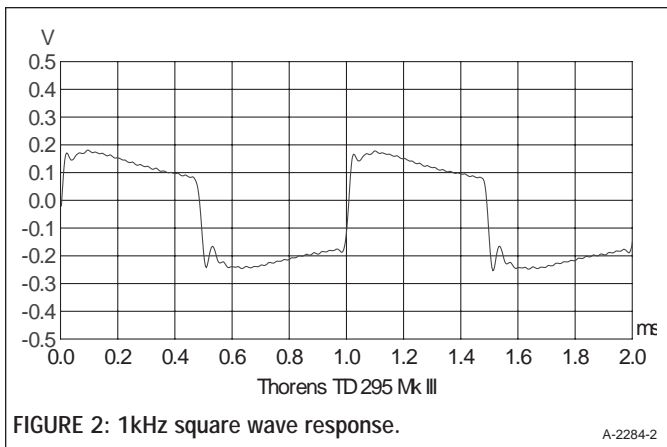
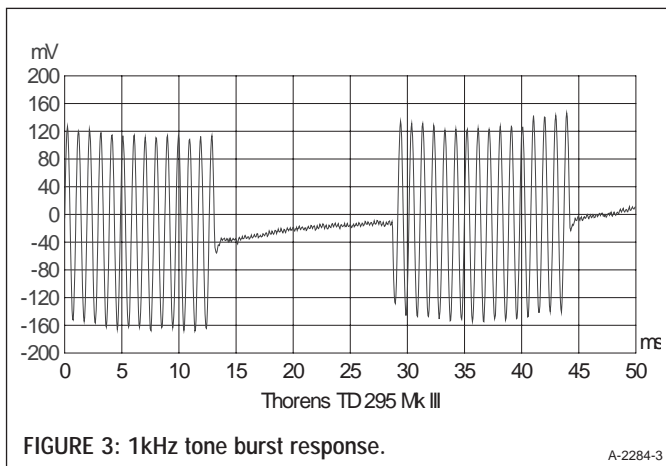
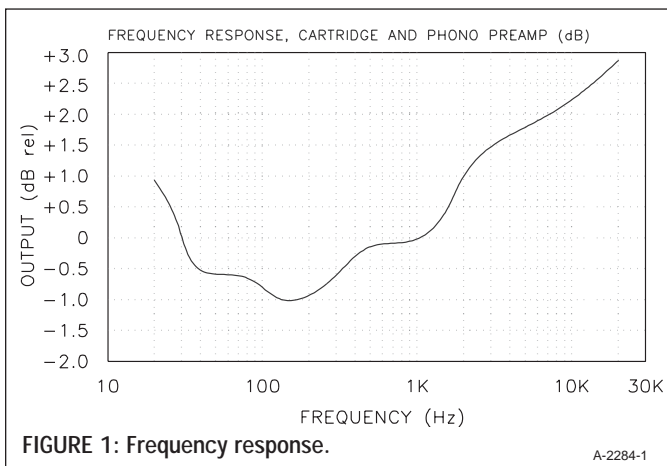
My LED strobe showed both platter speeds to be absolutely spot-on. The results were the same whether a record was being played or not. While the motor does take several revolutions to overcome the platter inertia, once at

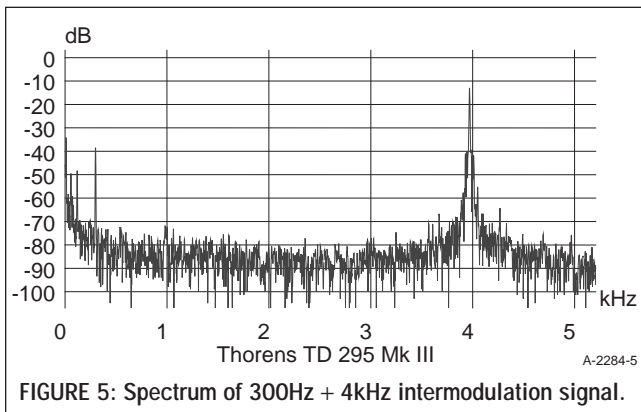
speed there is no movement of the bars on the strobe disk to indicate any flutter or wow. The strobe emits very narrow light pulses that are synchronized to the 60Hz power line.

I measured the frequency of three reference frequency tracks on the test record. The 440Hz "A" measured 440Hz, the 1kHz track measured 989Hz, and the 3kHz track measured 2968Hz. The latter two tracks are only 1.1% below the specified frequencies if the test record tracks were done perfectly.

The inner platter and motor pulley diameters have about a 6.86:1 ratio. The motor would need to turn about 229rpm for 33 $\frac{1}{3}$ rpm at the platter, and 308rpm for 45rpm at the platter. For a 10-pole synchronous motor, this requires an oscillator frequency at the motor stator windings of 19Hz and 25.7Hz, respectively.

I used a magnetic flux pickup placed near the motor end plate to try to determine the oscillator frequency. Using an oscilloscope, I found the flux waveform frequency to be very close to those values. The flux had a high percentage of second harmonic, indicating the stator may use two slots per





rotor pole. The motor reluctance torque also produces a second harmonic component in a synchronous motor stator at near full load.

When the speed select rotary switch is in the center stop position, the flux waveform appears to be 120Hz, perhaps indicating that a full-wave rectified “DC” voltage is applied to the stator windings to freeze the rotor position. The low motor frequencies allow the TD 295 motor pulley to be larger than a 60Hz line powered motor, providing more belt contact surface.

Figure 2 shows the cartridge response to a 1kHz square wave test track. The illustration in the test record booklet shows a slight tilt and cupping in the “ideal” as-recorded waveform, so it does not represent a perfect square wave shape. I have found that this rolled off wave-shape with a slight oscillation at the leading edges is the usual performance result in my testing.

TABLE 2
CHANNEL SEPARATION

WARBLE FREQUENCY	SEPARATION DB
6.4kHz–12.8kHz	-18.7
3.2kHz–6.4kHz	-23.5
1.3kHz–3.2kHz	-25.5
800Hz–1.2kHz	-27.9
400Hz–800Hz	-30.3

TABLE 3
MEASURED PERFORMANCE

PARAMETER	MANUFACTURER'S RATING	MEASURED RESULTS
Frequency Response:	20Hz–20kHz +3/-1dB	20Hz–20kHz +2.9/-1dB
Channel Separation:	22dB at 1kHz	18.4dB, 1.3kHz
	15dB at 15kHz	
Channel balance	1.5dB at 1kHz	1.1dB at 1kHz
Recommended Loading:	150–400pF, 47kΩ	
Compliance:	16μm/mN	
MM Output:	4mV at 5cm/s, 1kHz	4.0mV at 5cm/s, 1kHz
Wow and Flutter:	<0.045%, DIN 45507	
Rumble, unweighted:	>70dB, DIN 45-539-B	
Weighted:	>70dB, DIN 45-539-B	

Figure 3 shows the response to a 1kHz tone burst. The OMB 10 achieved very accurate results here, with no evidence of response dips, resonance, or spurious response. Figure 4 shows the exemplary response to the 10kHz tone burst track.

Figure 5 shows the Ortofon OMB 10 output spectrum reproducing a combined 300Hz + 4kHz intermodulation distortion (IMD) signal. The 4kHz signal is recorded at 7.5cm/s (-50dB rel), and the 300Hz signal is recorded at 9cm/s (-25dB rel). The 4.3kHz IMD product is -66dB, and the 3.7kHz product is -67dB, with no other spurious products evident. There are additional response peaks at 60Hz (-49dB) and 120Hz (-48dB).

I think these power line artifacts are due to residual hum pickup in my test setup, since I also noted them during the tests on the DacT CT 100 phono preamp. The CT 102 power supply is a high-frequency switcher, and does not bring the 60Hz line onto its power-supply board.

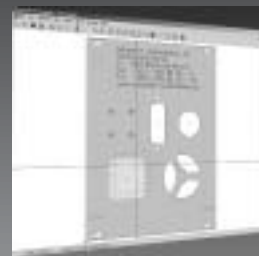
The manufacturer's specifications and measured results are shown in Table 3.

CONCLUSION

The TD 295 MK III is a substantial and stable record playing platform, with excellent speed performance and very good noise isolation. The Ortofon OMB 10 cartridge is a good match for the tonearm/table combination and offers fine performance. ❖

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