KENWOOD

L-07D

DIRECT-DRIVE TURNTABLE

High Rigidity

Kenwood's new turntable design aims at nothing less than 100 percent conversion of recorded to reproduced music signals.

High Rigidity

In searching for ideal reproduction of music from records, Kenwood's team of engineers have stripped away the "mental blocks" of conventional analog turntable design, to reach the sources of reproduction problems. As the result, they have achieved what many in the audio industry have thought impossible: a near 100% ratio of conversion of recorded to reproduced music signals. In fact, they have literally redesigned the turntable.

The analog type turntable has been with us for nearly a hundred years, but never before has its design been taken so close to its practical limits. In hi-fi design—as in so many fields—accepted conventions can cloud the designer's vision, while "improvements"—even electronic ones—are often no more than stop-gap measures deriving from an original misconception. Against this backdrop, Kenwood engineers set themselves the task of reexamining basic turntable problems.

First among these problems is the fact of energy loss caused by undesirable vibrational movement affecting the point of contact between the cantilevered stylus and the record groove. The audible effects of turntable and tonearm resonance had to be worked into a comprehensive theory before applying the solutions—among them, laminating different materials to mutually cancel out inherent resonant frequencies, and designing the entire signal conversion system into an ultra-rigid closed loop.

Moreover, since it is dynamic performance which dictates the quality of the music that is actually heard, Kenwood engineers have designed a totally new type of heavy, vibration-proof platter that achieves an extremely high moment of inertia to provide excellent transient load characteristic.

A further feature indicating out of the ordinary sound reproduction is the external Dynamic Phase Compensator, a logic control that precisely compensates for ambient variations in motor speed.

With such methodology, Kenwood engineers offer you the rich, dynamic musical lode that lies buried under existing sound conversion systems, and which even the digital PCM methods of the foreseeable future, with their standardized and finite limitations, will not be able to achieve.

Such claims may sound exaggerated in an audio world accustomed to frequent "breakthroughs". But any serious music lover who has perhaps accepted the inevitability of less-than-satisfactory record reproduction should not miss the first opportunity to hear a favorite recorded work played via the incomparable L-07D.

Kenwood's unique "back to the basics" design creates a highly rigid closed pickup loop.

- **High-Rigidity Triple Layer Base**
- **Low Resonance Triple Layer Platter**
- **Dynamic Phase Compensator**
- **Aluminum-Carbon-Boron Laminated Tonearm**
- **Carbon-Boron Headshell**
- **Low Gravity Integrated Design**

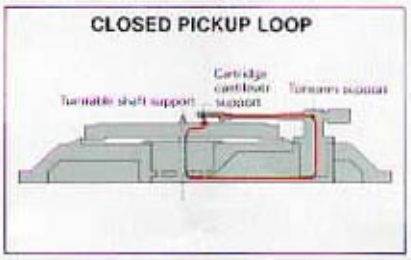
Why electronics do not solve all turntable problems

It seems incredible that the turntable of today actually differs very little from its original concept of a hundred years ago. In going back to examine those original concepts, it became clear to the Kenwood design team that the application of electronic solutions to solve basically mechanical problems is not always effective. And today's turntable problems are primarily mechanical. They stem from the unavoidable fact that the pivoted tonearm tracks a rotating record. Apart from increasing motor speed accuracy, the promise held out by electronics has not been fulfilled. Moreover, the digital PCM technique, in order to become widely available, will have to be standardized, rather like FM broadcasting. It will certainly aim at perfection, but only within finite limitations such as in frequency and dynamic range. By way of contrast, analog disc-cutting techniques can already record signals above 20kHz, and wider dynamic range is also available. Thus, the owner of the L-07D, which is designed to reduce vibrational distortion to zero, can at this very moment hear all of the exhilarating musical content inscribed in the best analog records available today.

Kenwood's "closed-loop" sound conversion theory

In the process of converting the recorded signal into one that can be heard, the mechanical aspect naturally plays a predominant role. And the very fact that both the record and the tonearm physically move is always a source of potential energy loss. Actually, when the stylus is tracing the inscribed record groove, any movement other than that strictly necessary for the tracing process results in mistracking or output distortion.

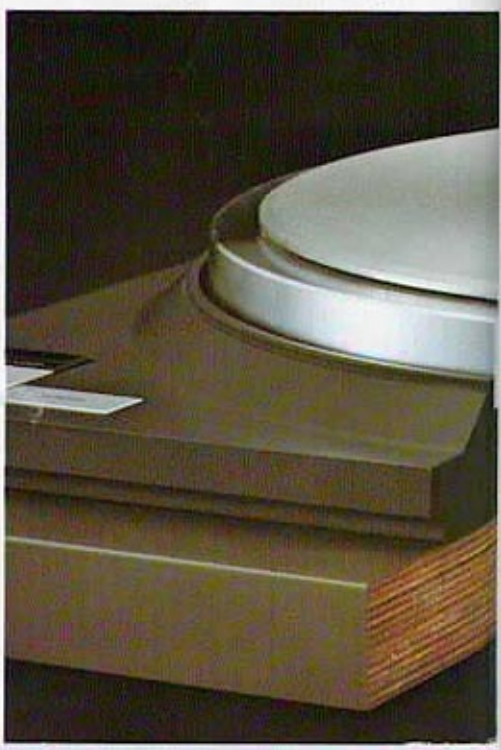
In a turntable, unwanted vibrational movement is likely to come from the three main pivotal points that in fact make up the turntable system. The first of these is the turntable, or more specifically, the motor shaft around which the platter revolves. The second is the tonearm pivot which is often incorrectly considered by designers as independent of the rest of the turntable. The third is the cartridge cantilever. The basic design of the L-07D rests on the knowledge, borne out by exhaustive laboratory tests, that only a precisely localized relationship between these three critical pivots can prevent loss of energy.

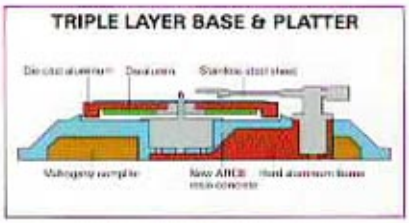


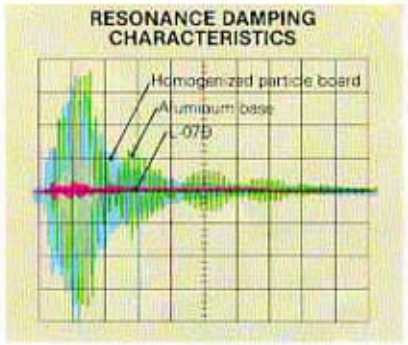
Thus, the L-07D system represents a closed-loop constructed as rigidly as the materials allow. In this uncompromising manner, Kenwood engineers have designed a turntable that can become the reference source for all analog record reproduction.

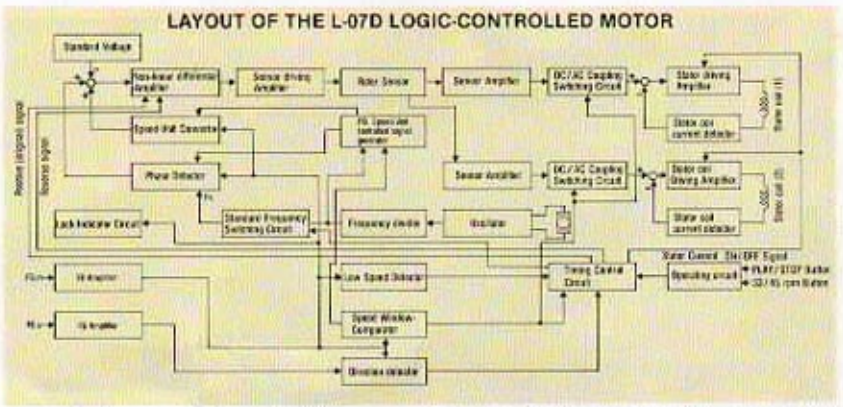
How Kenwood engineers designed the L-07D to absorb vibration over the entire audible frequency range

Kenwood engineers realized that only a highly rigid construction could prevent signal loss through undesirable vibrational movement. They therefore ruled out the use of conventional elastic vibration-damping materials such as rubber or metal springs, which merely damp vibrations through internal loss. More importantly, such common materials can create partial vibrations of several orders that may cause even worse resonances than those intended for suppression. On the other hand, since highly rigid materials have fairly precise resonant frequencies, bonding different materials together restricts resonant frequencies over a wide frequency range. This is the function of the massive 33kg (72.6lbs) triple layer base. It uses a new ARCB (Kenwood Anti-Resonance Compression Base) material (about 10kg/22.1lbs) made of a special resin-concrete which is bonded to a layer of mahogany complite (about 7kg/15.4lbs). This forms the entire cabinet. But embedded in this highly rigid composite base is a third element: a hard aluminum frame (about 2kg/4.4lbs) that provides the ultimate accurate localization of the motor and tonearm. This is one essential link in the continuous loop comprising stylus, arm, base, motor, platter and record. The result of this design is a freedom from resonance across the entire audible frequency range, and near-perfect conversion of recorded to reproduced signal—a unique achievement in the history of turntable design.



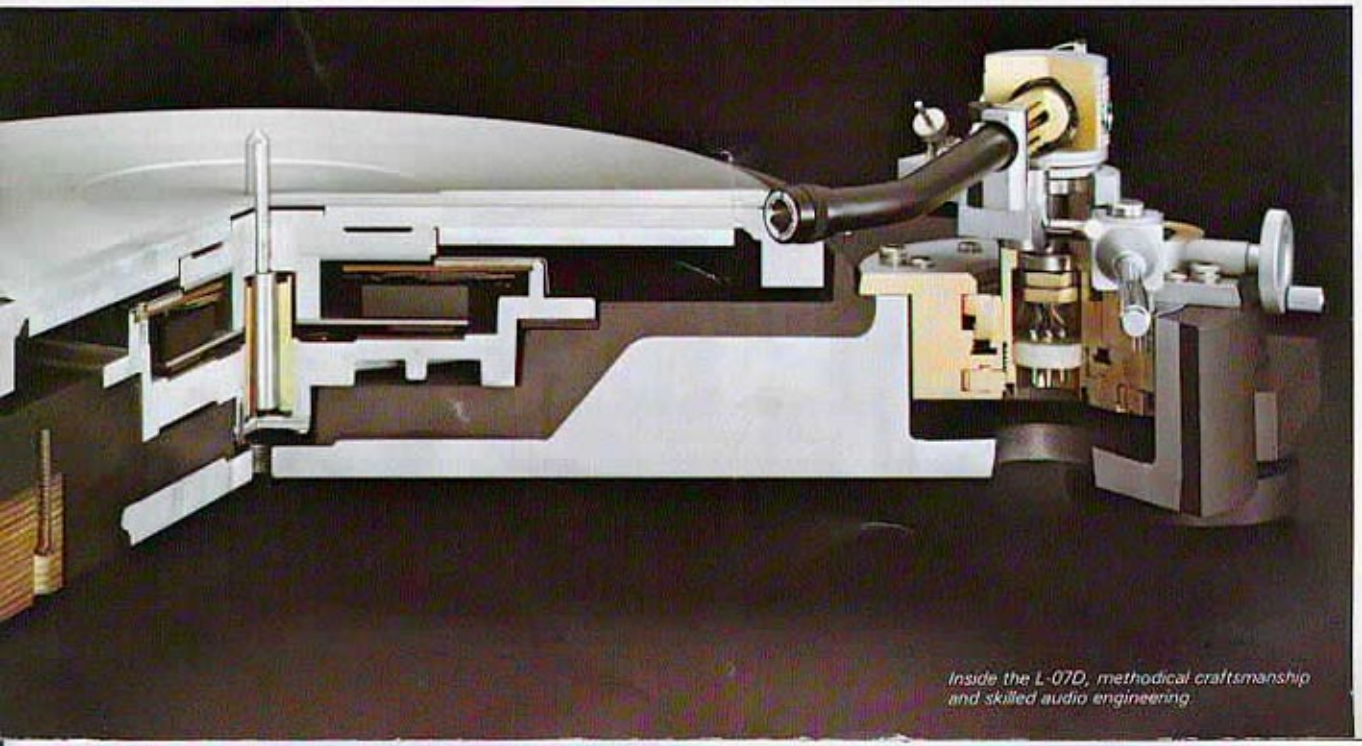






External Dynamic Phase Compensator controls ambient changes

The direct-drive system of the L-07D incorporates a highly sophisticated quartz-lock, speed-phase double servo control and constant-current type motor to maintain high accuracy in motor speed. But even with the best of servo-systems, various ambient conditions during turntable operation can produce speed fluctuations that can ultimately affect perceived sound quality. Such factors include temperature and humidity, and changes in viscosity resistance due to heat generated by the oil in the bearing system. Kenwood engineers have therefore incorporated an external logic control circuit that automatically compensates for ambient changes to within ±3% of rated speed. When a record stabilizer is used, changing the parameters, the phase compensator can be switched to a different value. The motor itself is an improved design, using a new hard aluminum die-cast casing and an exceptionally stable, rigid, 12mm diameter stainless steel center shaft around which the entire direct-drive system revolves. In this



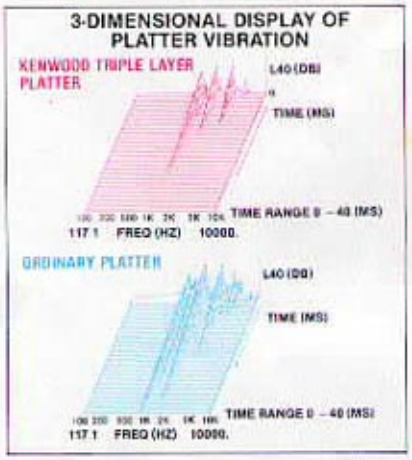
Inside the L-07D, methodical craftsmanship and skilled audio engineering

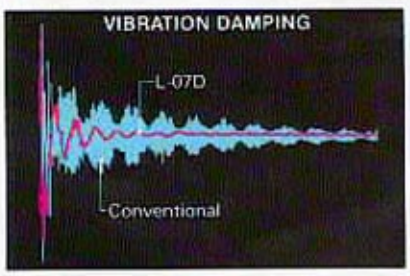
way, the motor has a fixed thrust to ensure high mechanical impedance under all dynamic conditions.

A high moment-of-inertia provides excellent transient load characteristic

Even the music signal itself can significantly affect reproduction at the stylus/record groove point of contact. A signal with a wide dynamic range, for example, can easily result in a momentary braking effect in platter rotation. For this reason, the L-07D incorporates a massive platter that produces a high moment-of-inertia of 1025 kg·cm². This is able to absorb all such random effects of transient music signals.

A vibration-proof triple layer platter with non-magnetic stainless steel platter sheet

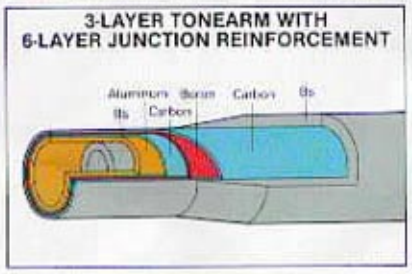




Another unique feature incorporated in the L-07D design is the structured platter. The massive die-cast aluminum platter is reinforced beneath by a 4 mm thick, duralumin layer. But on top of the platter is a second layer of 5 mm thick, vibration-proof stainless steel. The two surfaces are interfaced by precision machining to prevent ringing, while the non-magnetic nature of the steel sheet serves as a barrier to magnetism generated by a moving-coil type cartridge.

Highly rigid, tapered tonearm with 3-layer laminated construction in low-resonance design

When normal variations in recorded signal level are in the order of only a few microns, even the slightest instability in the tonearm can result in distortion. Actually, in conventional tonearm design, large amplitudes at resonant frequencies can result not only in horizontal and vertical movement, but even in twisting and "rattling" of the pivot. The Kenwood tonearm, designed as a highly rigid link in the L-07D system, achieves a remarkable freedom from such resonance problems. One feature is its pipe, a unique three-layer laminated structure using highly rigid materials: hard aluminum, boron fiber and carbon fiber. Each material is selected for its ability to restrict resonance amplitudes, as well as for its low mass and relatively large elastic modulus. At the pipe/holder junction, where the influence of vibration is many times greater, a tapered six-layer structure is used. This careful design is largely responsible for the accuracy and clarity of reproduction across the audible range, particularly at low-level low frequencies that are most difficult to reproduce authentically.



The carbon-boron headshell

Headshell resonance usually occurs at frequencies at which the ear is most sensitive—between 1kHz and 5kHz—and is the reason that headshells often have a distinct tonal quality. To avoid this problem for the L-07D system, Kenwood engineers designed a headshell that raises resonance out of the critical audible range, while fulfilling basic requirements such as rigidity and low mass. The new design uses carbon and boron fibers laminated in opposed fiber directions to increase torsional strength.

Tonearm base with precision Collet chuck provides extreme rigidity and stability

Too many tonearms are treated as add-on features without regard to the probable effects of vibration caused by imperfect fixture to the base. Kenwood engineers take a different view. This is why you will find an extra-wide diameter, stainless steel tonearm shaft, and a massive base clamped directly to the metal frame that links tonearm to motor. To achieve maximum rigidity in this fixture, a genuine Collet chuck is used—the same type employed for precision machinery—which reaches a pressure force of

L-07D

SPECIFICATIONS

MOTOR & TURNTABLE

Drive System	Quartz PLL Direct-Drive
Motor	Coreless & Slotless DC Servo Motor (Starting Torque 2.5kg·cm)
Turntable Platter	33cm (13") Diameter, Aluminum Alloy Die-Cast Laminated with Duralumin. Weight—5.5kg (12.1lbs) Including Non-Magnetized Stainless Turntable Sheet. Moment of Inertia—1025kg·cm^2
Speeds	2 Speeds, 33-1/3 and 45rpm.
Wow & Flutter	Less than 0.02% (WRMS)
Rumble	DIN Weighted Better than −94dB
Load Fluctuation	0% (within 120g of tracking force)
Transient Load Fluctuation	Less than 0.00015% (at 33-1/3rpm, 400Hz, 20g·cm load) Less than 0.00008% (at 33-1/3rpm, 1,000Hz, 20g·cm load)
Time & Temperature Drift	Limitation of Measurement

TONEARM

Type	Static-Balanced Type, J-Shaped Pipe Arm, EIA Plug in Connector.
Effective Tonearm Length	245mm (9-5/8")
Overhang	15mm (9/16")
Tracking Error	+2°26' ~ −1°11' − +1°48' (150mm) (85mm) (50mm)
Stylus Pressure Variable Range	0 to 2 grams (50mg steps)
Usable Cartridge Weight (with Supplied Headshell)	1 to 9 grams 9 to 22 grams (with addition of Included weight)
Adjustable Height Range	Within 7mm (1/4") By Helicoid Fixture (0.1mm steps)
Arm Base	Collet Chuck Type, Weight 1.5kg (3.3lbs)
Headshell	Compression-Molded Carbon and Boron Fibers. Weight—12g

ADDITIONAL FEATURES

Illuminated Quartz-Lock and Power Indicator,
Electronic and Mechanically Controlled Brake,
Arm-Height Adjuster,
Anti-Skating Device,
Oil-Damped Cueing Control,
LED Speed Indicators,
Adjustable Height Insulator (12mm or 1/2") with Level Indicator,
Stylus Pressure Direct Readout Counter,
Sub-Tonearm Space for 14-inch Tonearm.

MISCELLANEOUS

Power Requirement	AC 120V, 60Hz
Power Consumption	11.0 watts
Dimensions	
Turntable and Motor	W 555mm (21-7/8") H 160mm (6-5/16") D 470mm (18-1/2")
Control Unit	W 130mm (5-1/8") H 110mm (4-11/32") D 356mm (14")
Weights	
Turntable and Motor	31.0kg (68.2lbs)
Control Unit	4.3kg (9.5lbs)

SUPPLIED ACCESSORIES

Low resistance & low capacitance phono cables with gold plated terminals, 45rpm adaptor with overhang gauge, Turntable platter cover, Dust cover cloth, Screwdriver, Silicon cloth, Ground wire.

CABINET

Material... The cabinet is constructed of an Anti-Resonance Compression Base (ARCB) with die-cast aluminum frame and mahogany complite material.

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

KENWOOD®

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