

Technics SL-1600MK2

Quartz Synthesizer Direct Drive
Fully-Automatic Turntable



QUARTZ

The SL-1600MK2 reflects many of the developments which made Technics a leader in the turntable industry, while adding some new features of its own.

To begin with, it combines quartz-phase-locked speed accuracy with high torque and near-instantaneous start-up. Quick stops are also provided by an electronic braking system. Pitch is adjustable within a range of $\pm 6\%$, totally under quartz control. With the exception of the pitch control, all front-panel controls are governed by a micro-computer and effected with soft-touch switches.

Even the size of the record is automatically sensed for tonearm set-down, with an infrared sensor. The automatic tonearm mechanism is precisely manufactured to provide extremely smooth, noise-free operation.

A high-sensitivity (7 mg), low-mass (12 g) tonearm features a precision gimbal suspension and adjustable arm height. Cueing controls are provided both on the front panel and the tonearm base, with automatic cartridge-output muting in effect whenever the cueing controls or automatic functions are being used.

A double isolated suspension system provides acoustic isolation, with an elegant aluminum outer base and an independently supported inner base made of non-resonant "TNRC". A quartz-controlled stroboscope, pop-up stylus illuminator and LED pitch indicators further enhance the convenience and ease of operating the turntable. Needless to say, rotational accuracy and signal-to-noise ratio are among the best obtainable at any price: wow and flutter are a miniscule 0.025% WRMS; rumble an inaudible -78 dB DIN B.

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Total Quartz Locked Continuous Pitch Adjustment within $\pm 6\%$

Quartz-phase-locked control provides rotational accuracy that is not approached by other turntable servo systems.

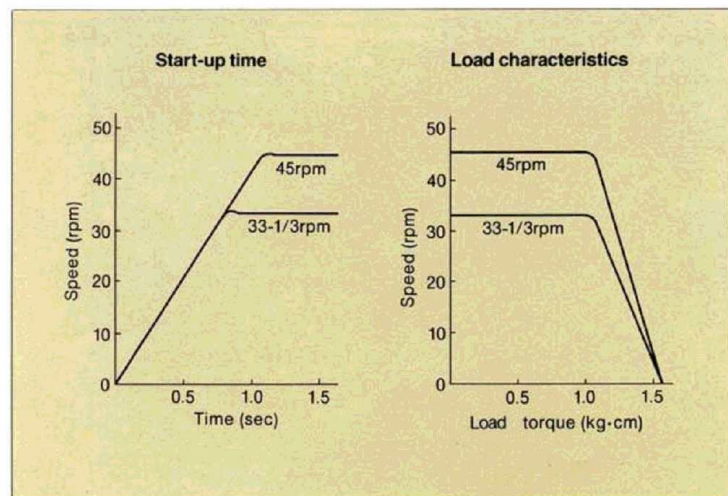
With the large majority of quartz-controlled turntables, however, the quartz servo system must be defeated when speed changes are required (such as for matching musical pitch to an instrument). Technics was the first company to develop a "quartz synthesizer" system which maintained quartz accuracy in pitch-altered modes. This system permitted quartz-controlled speed changes in increments of 0.1%.

Now, with the SL-1600MK2, pitch is variable continuously (analogically) by up to $\pm 6\%$, under quartz control. Pitch changes are made by turning a knob on the front panel. As this is done, a series of thirteen LED's light to indicate percentage of pitch change—plus and minus 1, 2, 3, 4, 5, and 6%, and exactly on speed. In any case, the unsurpassed accuracy of the quartz system remains in effect.



High Torque for Fast Starts

The integral rotor/platter motor delivers 1.5 kg-cm (1.3 lb in) starting torque. This high torque gives very quick starts, bringing the platter up to 33-1/3 rpm speed within 0.7 second or a quarter of a turn. This is a big advantage in professional applications, where fast cueing is often a necessity.



Excellent Load Characteristics for Steady Speed

Speed fluctuation due to load drag (such as a record cleaner or pressure from the tonearm) is virtually eliminated thanks to the elaborate and quick responding servo circuits. Fluctuation is 0% with loads of up to 1.0 kg cm (0.87 lb in). To give you an idea of how high this torque is—if you could fit 100 tonearms onto a record, each tracking at 2 grams, the platter would continue to rotate at precisely the chosen speed.

Fully-Automatic Tonearm Action with Micro-Computer Control and Muting Circuit

A micro-computer governs and controls all tonearm functions—auto-start, auto-stop, auto-repeat, auto-repeat and double cueing control. You'll discover that the automatic operation of the tonearm is so quiet that you'll almost have to look at it to know it's moving. Technics uses mechanically quiet, precision-molded, rugged synthetic parts to avoid deterioration. The result is smooth virtually noise-free operation. An automatic muting circuit cuts off output from the cartridge whenever the arm is picked up or set down either by the automatic mechanism or the cueing control. This avoids irritating shock noises.

Automatic Disc Size Sensing and Repeat-Play Control with Infrared Sensor

With the SL-1600MK2, disc size selection (i.e. 12", 10", 7") is made automatically. An invisible infrared ray is generated from the underside of the platter. Through three small openings in the platter, it reaches a sensor installed in a pole near the tonearm base.

The record on the turntable mat blocks a portion of the infrared, and from this the size of the record is determined. The micro-computer mentioned above handles the information and causes the tonearm to descend at the appropriate point.

If there is no record on the platter when the "start" switch is pushed, the tonearm will not move, so accidental operation is impossible. In addition, the repeat action of the tonearm is improved over our past designs. If you operate the turntable in a repeat-play mode, the tonearm will return to the lead-in grooves and descend rather than going back to the tonearm rest as in past models.



All Front-Panel Controls

Operational convenience is enhanced by putting all controls, even the cueing control and LED display, in-line on the front panel. The control buttons are precision-designed to require a moderate but definite amount of pressure for activation. This design gives a sense of positive control and minimizes the possibility of its accidental activation. For your convenience, a second cueing control is located on the tonearm base.

Double Isolated Suspension System with TNRC Inner Base

Acoustic feedback is a potential problem whenever the turntable is located in the same room as the speakers, as is the case in nearly all home systems. Technics developed a double isolated suspension system to drastically reduce the potential for feedback. The outer base is made from diecast aluminum and is supported by a carefully tuned set of isolators. The inner base, which supports the all-important platter, motor and tonearm base, is made from our heavy, anti-resonant "TNRC" material (Technics Non-Resonant Compound). This inner base is supported by a second set of isolators. Altogether, this double suspension makes it very unlikely that you'll ever encounter a feedback problem. Even the platter is double-damped, with a specially fabricated rubber mat placed on the underside of the turntable as well as the top.

Stylus Illuminator for Low-Light Conditions

You'll appreciate the stylus illuminator when you are using the turntable under low-light conditions, or if it is placed in a rack. The illuminator can be hidden in the turntable base. Should you need it, simply push a button and it will pop up gently and cast a beam of light across the disc in the area traversed by the tonearm. You can then clearly see the spaces between the selections on the record, and cue the arm exactly where you want it. The illuminator can then be pushed back down into the base.



Quartz Oscillator-Controlled Strobe Illuminator with Four Indication Lines

A quartz controlled LED strobe illuminates four lines of stroboscope markings on the platter edge. These markings correspond to percentages of speed change: +6%, +3.3%, 0% (standard speed) and -3.3%. When the line of markings seem to stand still, this means that the platter is rotating at precisely the indicated speed.

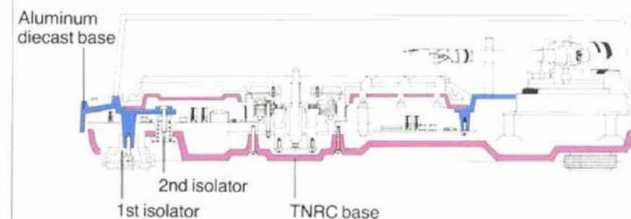
High-Sensitivity, Low Mass Gimbal Suspension Tonearm

The highly sensitive tonearm suspension features a genuine "gimbal" design, the rotational center of which is precisely defined at a single point. Bearings are finished to a tolerance of ± 0.5 microns. This, and the close-proximity of the bearings to the pivot center, result in an effective friction of 7 mg (0.007 grams) for both horizontal and vertical movement. Add to this the low, 12-gram effective mass of the tonearm (including the headshell) and you have a tonearm compatible with the wide range of compliances found in today's cartridges. If you choose a popular high-compliance cartridge, the low frequency resonance will appear in the correct area to avoid warp frequencies of records, but without entering the low end of the audio spectrum. The tonearm includes a computer-designed, light weight, high-rigidity headshell which contributes to low effective mass while resisting partial vibration. It is a "universal" type, which permits easy removal and interchanging with other universal headshells. Contacts are gold-plated so as to be as highly conductive of low-voltage cartridge signals as possible.

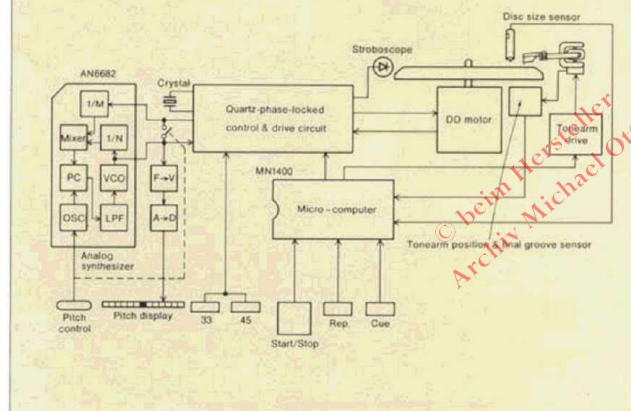
Helicoid Tonearm Height Adjustment

The height of the arm can be adjusted within a range of 6 mm to accommodate varying cartridge dimensions. Adjustments are made with a precision helicoid.

Double isolated suspension

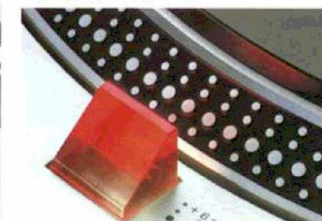


Block diagram



Other Fine Features

- Electronic braking system brings platter to a quick stop.
- Prism strobe illuminator, governed by quartz oscillator rather than potentially unstable AC line frequency.
- Soft-touch start/stop switch provides positive control while minimizing chances of accidental operation.
- Technics integral rotor/platter structure with full-cycle detection FG.



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Technical Specifications

TURNTABLE SECTION

Type	Quartz Synthesizer Direct Drive Fully-Automatic Turntable
Motor	Ultra-low-speed brushless DC motor
Turntable platter	Aluminum diecast, diameter 13-5/64" (33.2 cm) weight 4.4 lb (2 kg) (including rubber matting)
Turntable speeds	33-1/3 and 45 rpm
Pitch controls	All quartz-locked within $\pm 6\%$ range
Starting torque	1.3 lb-in (1.5 kg-cm)
Start-up time	0.7 sec (90° rotation)
Braking system	electronic brake
Speed fluctuation due to load torque	0% within 0.87 lb-in (1.0 kg-cm) (up to 200 g tracking force)
Wow and flutter	0.01% WRMS* 0.025% WRMS (JIS C5521) $\pm 0.035\%$ peak (IEC 98A weighted)

Rumble	-56 dB DIN A (IEC 98A unweighted) -78 dB DIN B (IEC 98A weighted)
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TONEARM SECTION

Type	Universal "S" shaped tubular arm, static-balanced type, with anti-skating force control device, oil-damped cueing device in both directions
Effective length	9-1/16" (230 mm)
Overhang	19/32" (15 mm)
Friction	7 mg (lateral, vertical)
Effective mass	12 g (including headshell, but without cartridge)
Tracking error angle	+0°32' at the inner groove of record +2°32' at the outer groove of record
Offset angle	22°
Adjustable tracking force	0-2.5 g

Cartridge range	6-9.5 g 3-6.5 g (with addition of included weight)
Headshell weight	7.5 g
Tonearm height adjustment	6 mm

GENERAL	
Power supply	AC 120 V, 50/60 Hz
Power consumption	15W
Dimensions (H×W×D)	5-7/8"×17-27/32"×15-45/64" (14.9×45.3×39.9 cm)
Weight	22 lb (10 kg)

* This rating refers to turntable assembly alone,
excluding effects of record, cartridge or tonearm, but
including platter.
Measured by obtaining signal from built-in frequency
generator of motor assembly.

Technics

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