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 **QUARTZ**

**SL-1300MIK2**

**Fully-Automatic**

**SL-1400MIK2**

**Semi-Automatic**

**SL-1500MIK2**

**Manual**

The new generation of quartz  
phase-locked direct drive  
turntables with quartz  
synthesizer pitch control

*Professional Series*

**Technics**  
by Panasonic



# Now Turntable Technology Combines Quartz Timekeeping Accuracy to Assure Constant Speeds under Varying Loads

Ever since scoring a major breakthrough with the introduction of the first direct-drive turntable, Technics' engineers have been hard at work perfecting the system. Now, with the new generation of direct-drive turntables, total quartz control has been applied to achieve the ultimate in performance. Thanks to quartz phase-locked control, all speeds are constant and maintained at near perfect rotation even under varying loads. The integrated rotor-platter direct-drive construc-

tion produces more torque and makes a simpler, lower silhouette design possible. So simple is the design that there are only two main parts. Which are, the moving rotor-platter and the stationary stator-casing. And with fewer parts, there is less that can go wrong or interfere with performance. What's more, the direct-drive system with total quartz control produces the most impressive specifications, which in many cases exceed those of the disc cutting equipment.



**SL-1300MK2 Fully-Automatic**



# More Thoroughbreds from the SP-10MKII Stable

It was the SP-10MKII that first made history by its unrivaled speed accuracy, enormous torque and super-fast start/stop action. Today, all Technics quartz phase-locked direct-drive turntables have inherited the same performance. The new generation, which includes the SL-1300MK2 fully automatic, SL-1400MK2 semi-automatic and SL-1500MK2 manual models, is truly a professional series. The major specifications for each model are identical. Rumble is  $-73$  dB or less, measured according to the accepted DIN-B (weighted) method, while wow and flutter amounts to 0.025% WRMS. The figures speak for themselves, and what began as a daring break with tradition has now become the accepted standard.



**SL-1400MK2 Semi-Automatic**



**SL-1500MK2 Manual**



# There's More to the Spec Sheet Than Just the Rumble and Wow & Flutter Readings

## 33-1/3 rpm Attained within 0.7 sec or a Quarter Turn

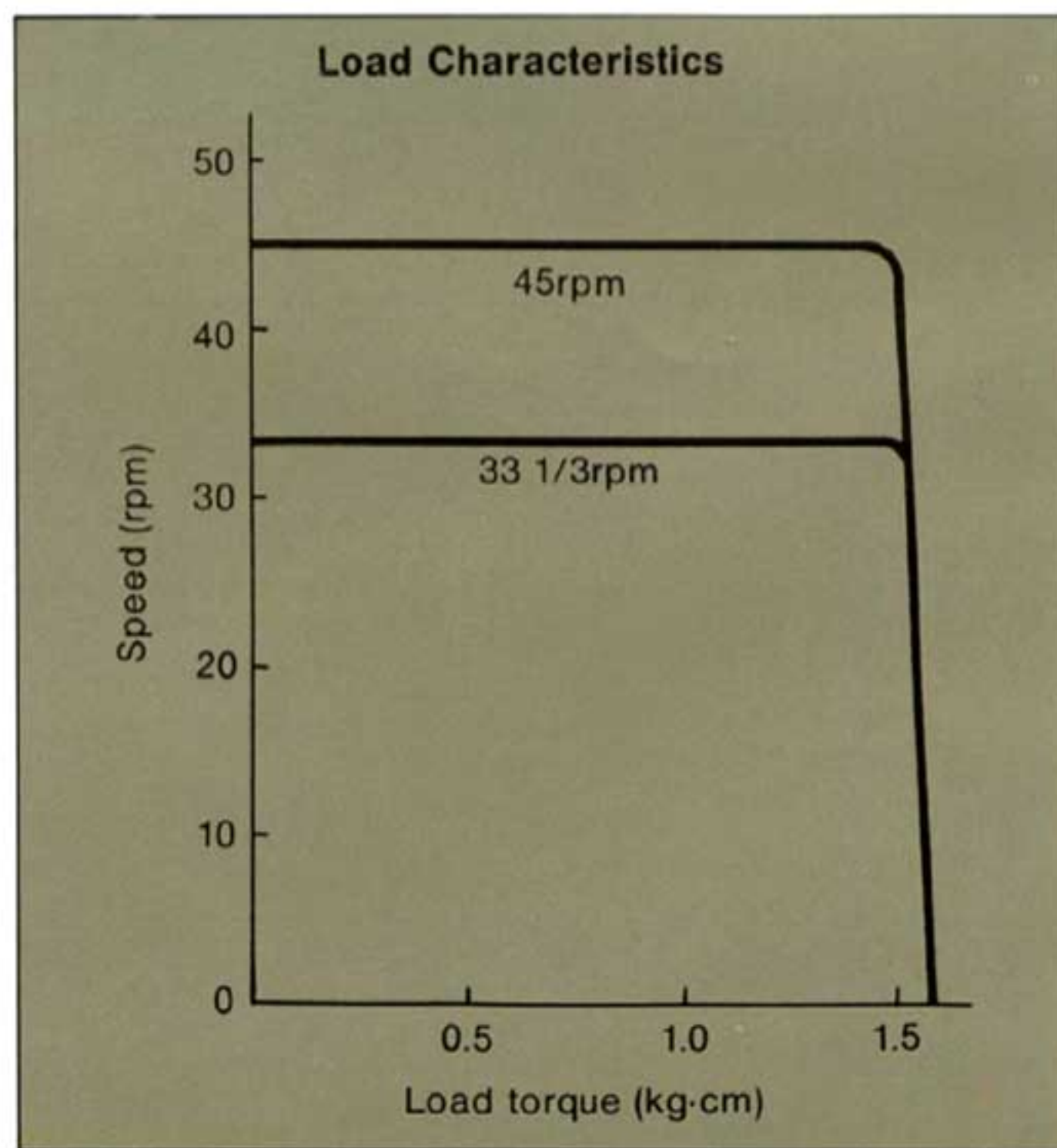
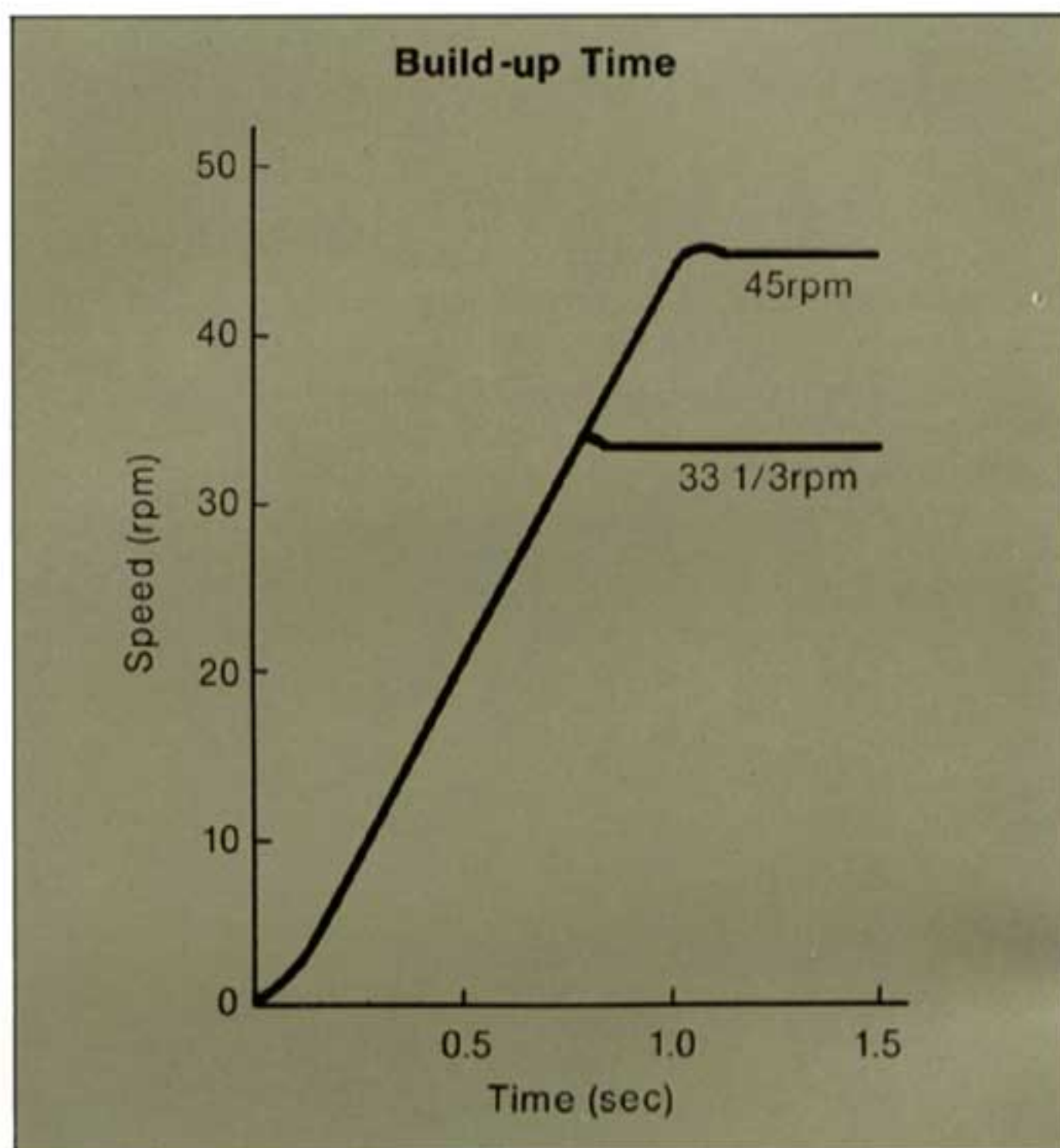
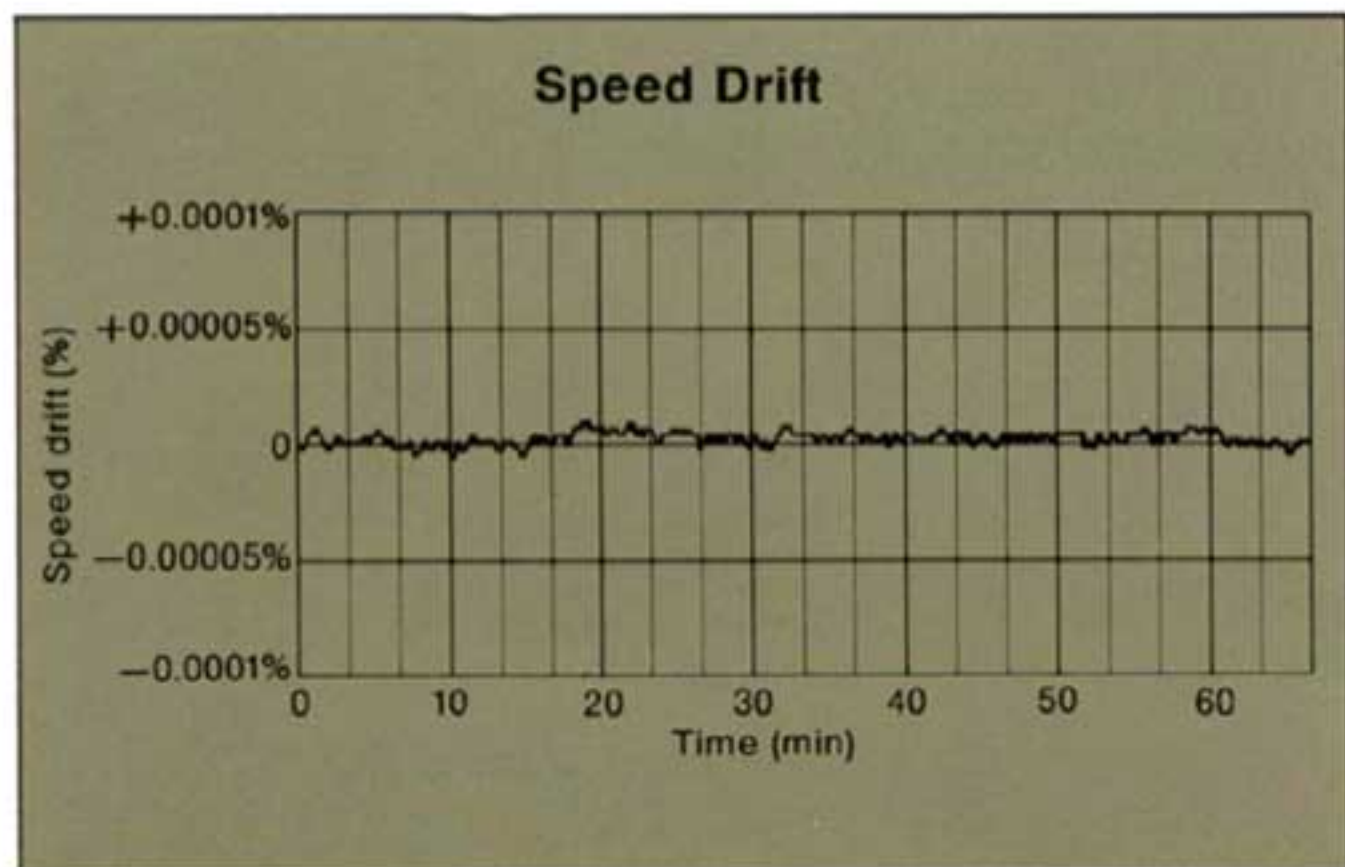
With a high start-up torque of 1.3 lb·in (1.5 kg·cm), there's no waiting for the platter to warm up. The rated speed of 33-1/3 rpm is reached within 0.7 sec or a quarter turn. This is a big advantage when almost instant cueing is desired.

## 150 Tonearms Could Not Affect Rotational Speed

Ridiculous but true. It would take more than 150 tonearms, each tracking at 2 grams, to affect the rotational speed of a Technics direct-drive turntable. With such a high running torque, the turntable is unaffected by load changes.

## Only $\pm 0.036$ sec Variation after 30 Minutes Playing

Technics direct-drive turntables have excellent speed stability thanks to quartz phase-locked control. Beethoven's entire nine symphonies can be played with a speed error of less than one note each time.





# Another First from Technics: Quartz Synthesizer Pitch Control with Digital Readout



## Perfect Pitch Control over 199 Speeds

By using a programmable quartz synthesizer, 199 individual speeds can be controlled with time-keeping accuracy. This represents a 9.9% variation above and below the rated speeds of 33-1/3 and 45 rpm. A variation of plus 5.9% or minus 5.6% corresponds to one half tone.

With this kind of pitch control, records may be "tuned" accurately to the piano or other musical instruments of relatively accurate and constant pitch. Slight changes in pitch during the manufacture of phonograph records may be corrected. An important application in professional work such as broadcasting or discotheque is the ability to fit a given tune into a given time slot.

## Choice of 398 Pitches Possible

Pitch changing is done by means of two feather-touch pushbuttons. Each touch of the plus button increases the pitch by 0.1%, or it can be decreased by pushing the minus button. If either button is kept depressed, the pitch will continue to change up to a maximum of  $\pm 9.9\%$ . An LED digital display indicates the rated speed on the left and the pitch variation on the right with the appropriate plus or minus sign.





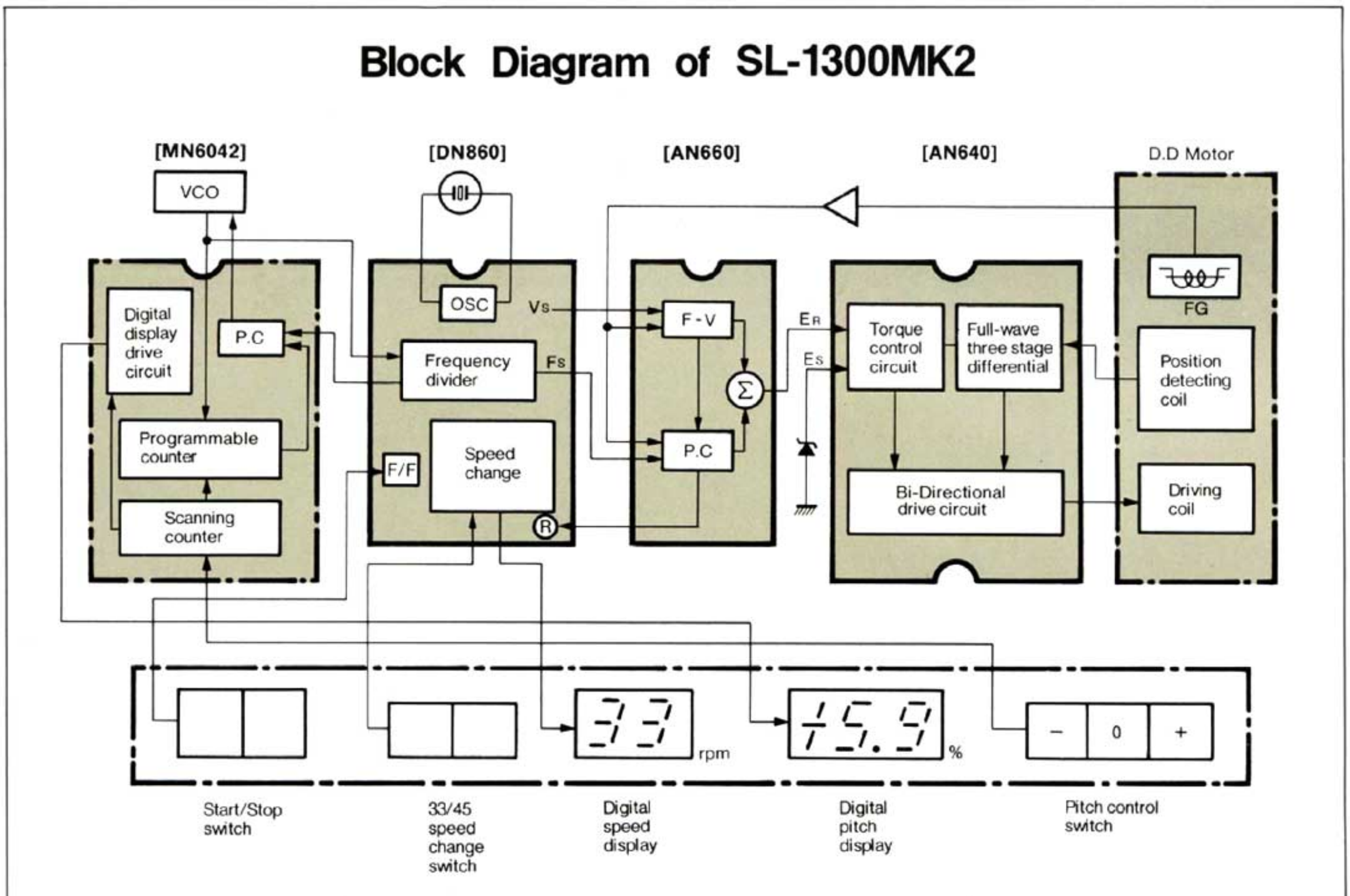
# All Drive and Control Functions Effected by Four High Density ICs

## More Than 3,000 Discrete Elements Replaced by Four Tiny ICs

The secret behind the sleek lines, high performance and easy operation of Technics direct-drive turntables is space-age, space-saving, solid state technology. All the functions are driven and controlled by integrated circuits. No less than four high density ICs have been incorporated to handle the basic functions of the quartz synthesizer pitch control and digital driver, quartz oscillator frequency divider and speed change control, phase and speed control, and full cycle integration type frequency generator. Automatic models also have advanced detection and logic circuits as well. The MN-6042 silicon gate CMOS LSI, which drives the quartz

synthesizer pitch control and LED display, does the job of 1,856 discrete elements. It automatically scans the speed with amazing accuracy and changes it step-by-step in 0.1% increments on command up to 9.9% above and below the rated speed. The DN-860, AN-660 and AN-640 ICs have the equivalent of 380, 427 and 340 elements each and all work in conjunction with the MN-6042. What all this new, highly complex IC/LSI technology achieves in terms of speed accuracy, overall performance and operational simplicity, is what makes Technics new generation of direct-drive turntables so unique. It has set the standard for future turntable design and development.

**Block Diagram of SL-1300MK2**

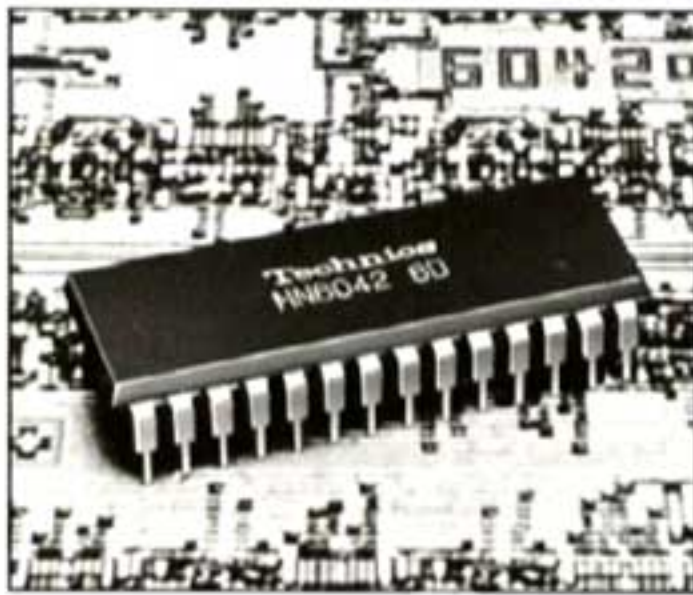
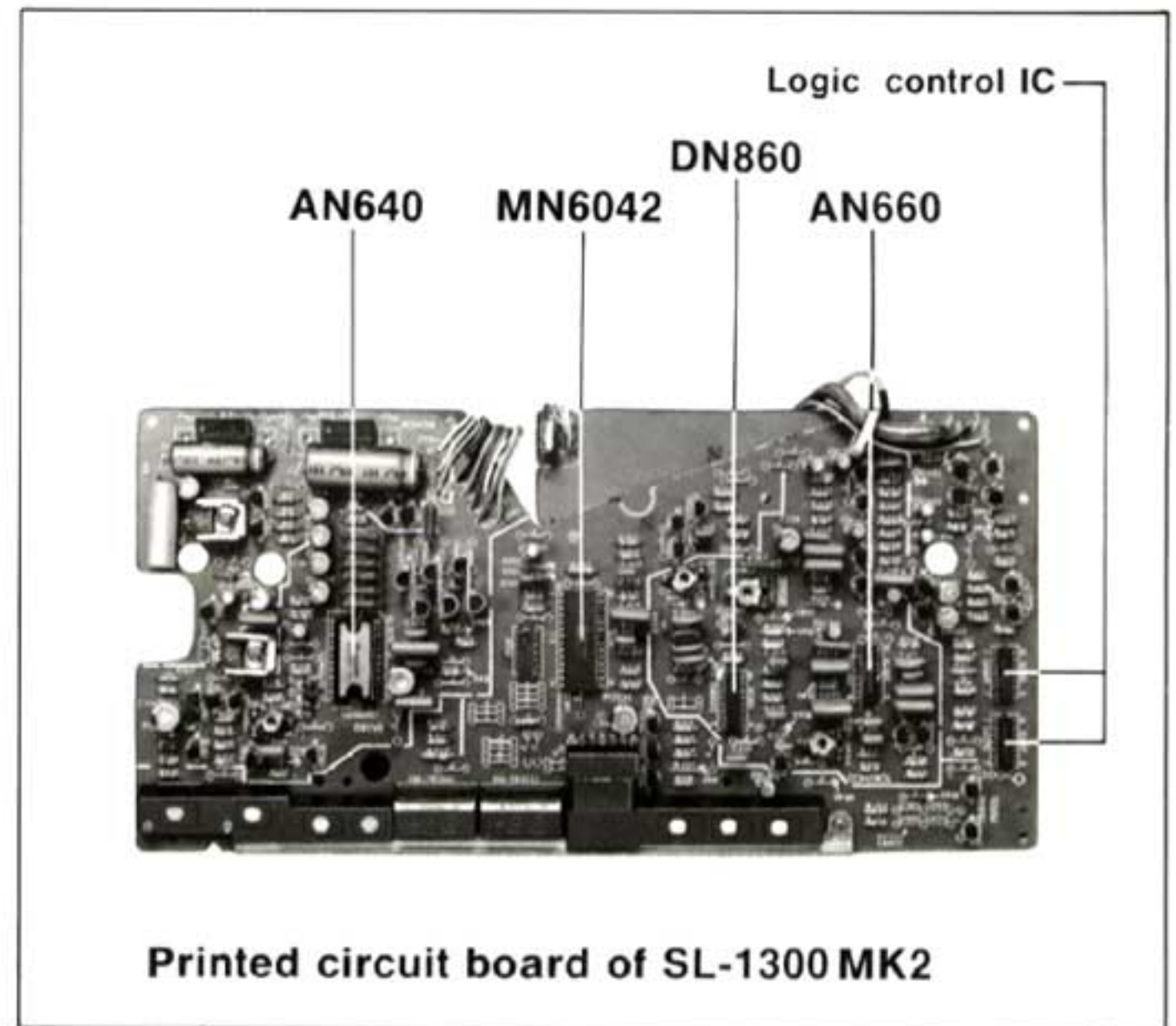




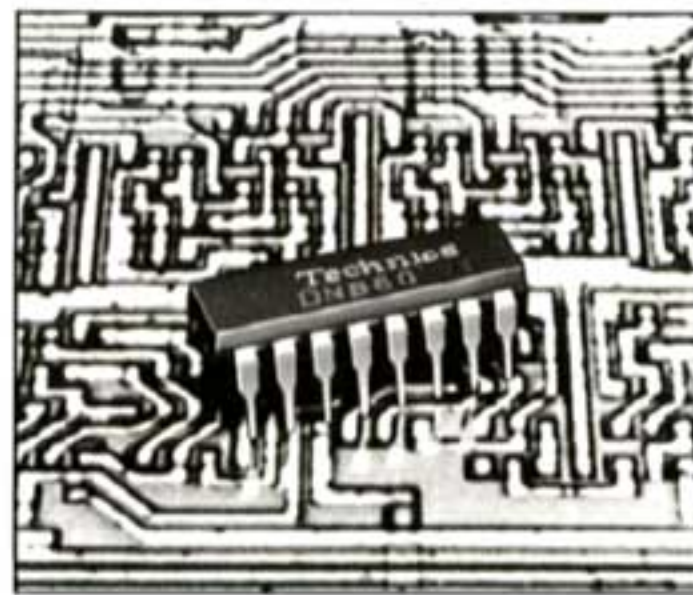
# Quartz Locked at Each Pitch Control Step

Unlike other quartz locked phase control systems (which are automatically cut out when the pitch control is employed), the unique quartz synthesizer pitch control featured in the SL-1300MK2 is designed with quartz locked accuracy at all pitch control settings.

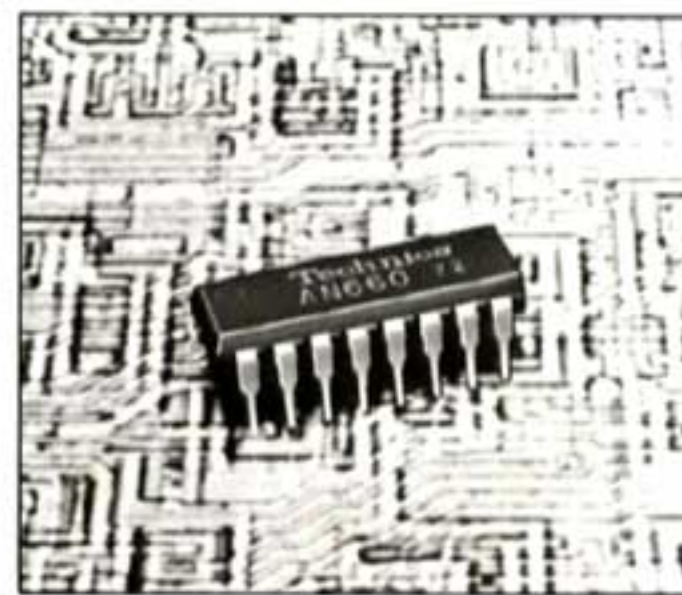
The conventional quartz locked turntables with pitch control lack quartz-locked accuracy and stability when using pitch control because they depend on the accuracy of less stable CR oscillator. Moreover, since the pitch is not indicated digitally, it is difficult to identify the exact pitch chosen. In a few turntables, this problem has been partly overcome by varying the quartz frequency divider factors, but the resultant pitch control range is very limited (about  $440 \text{ Hz} \pm 6 \text{ Hz}$ ).



MN6042 (1856 elements)



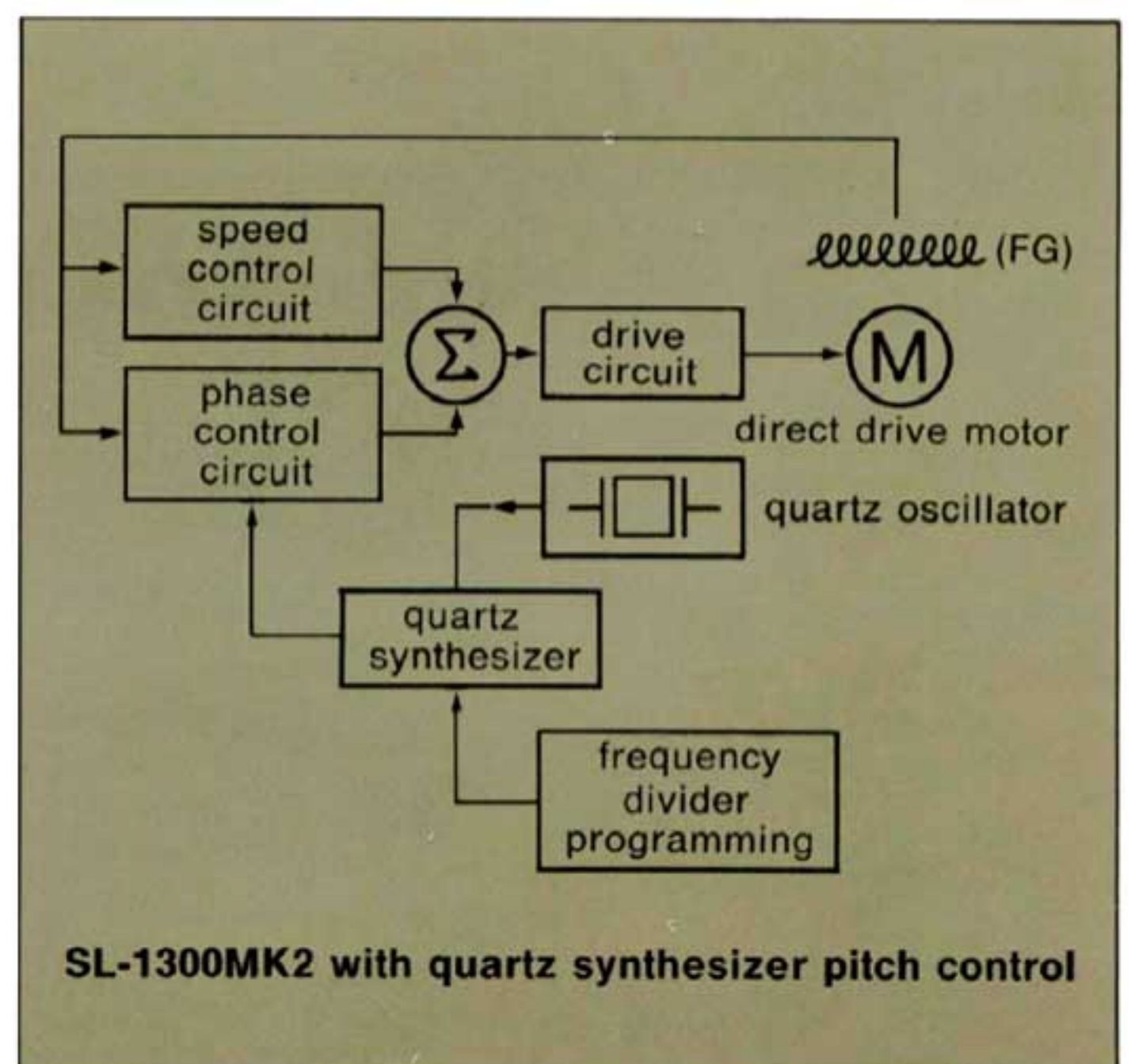
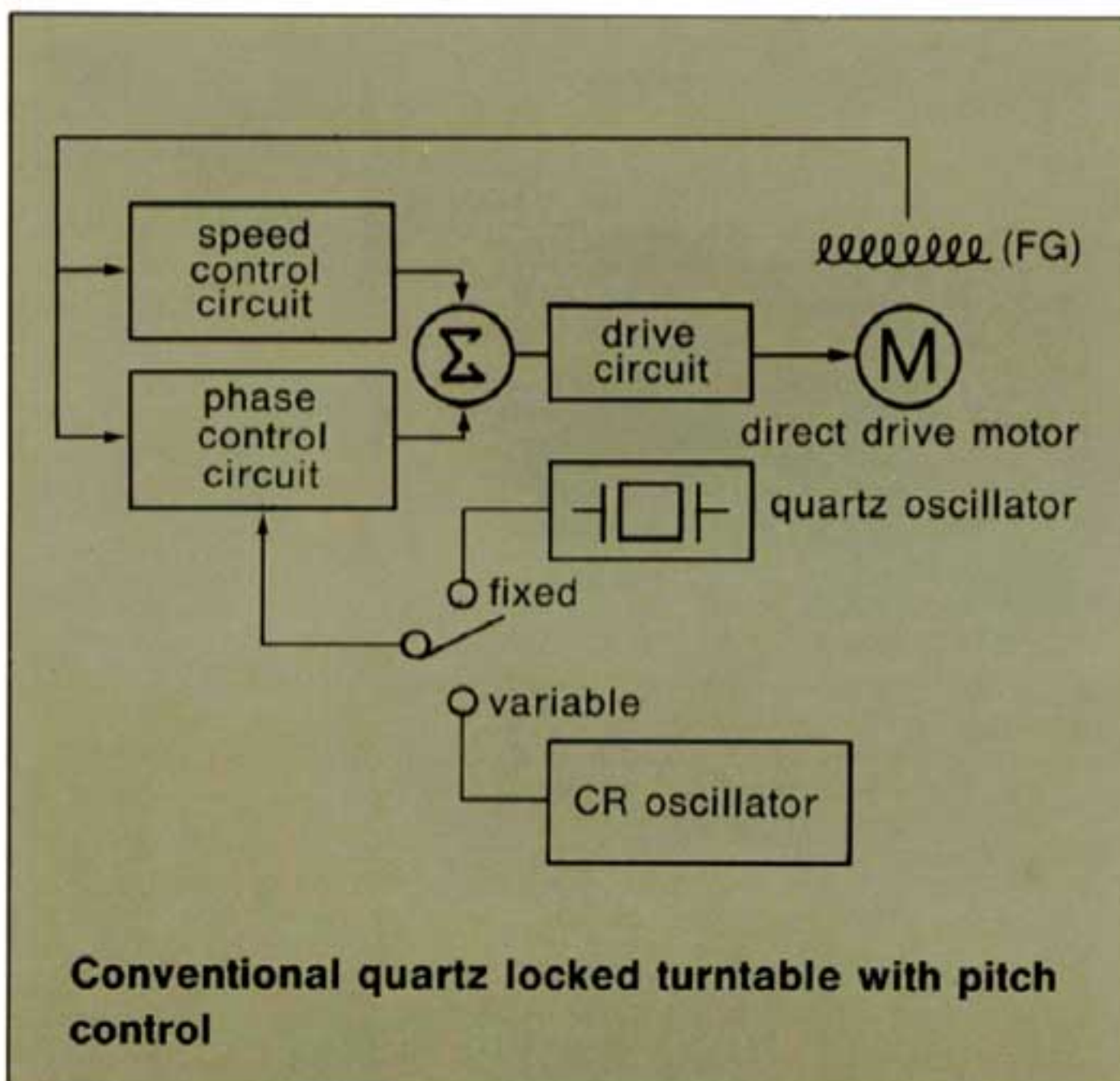
DN860 (380 elements)



AN660 (427 elements)



AN640 (340 elements)





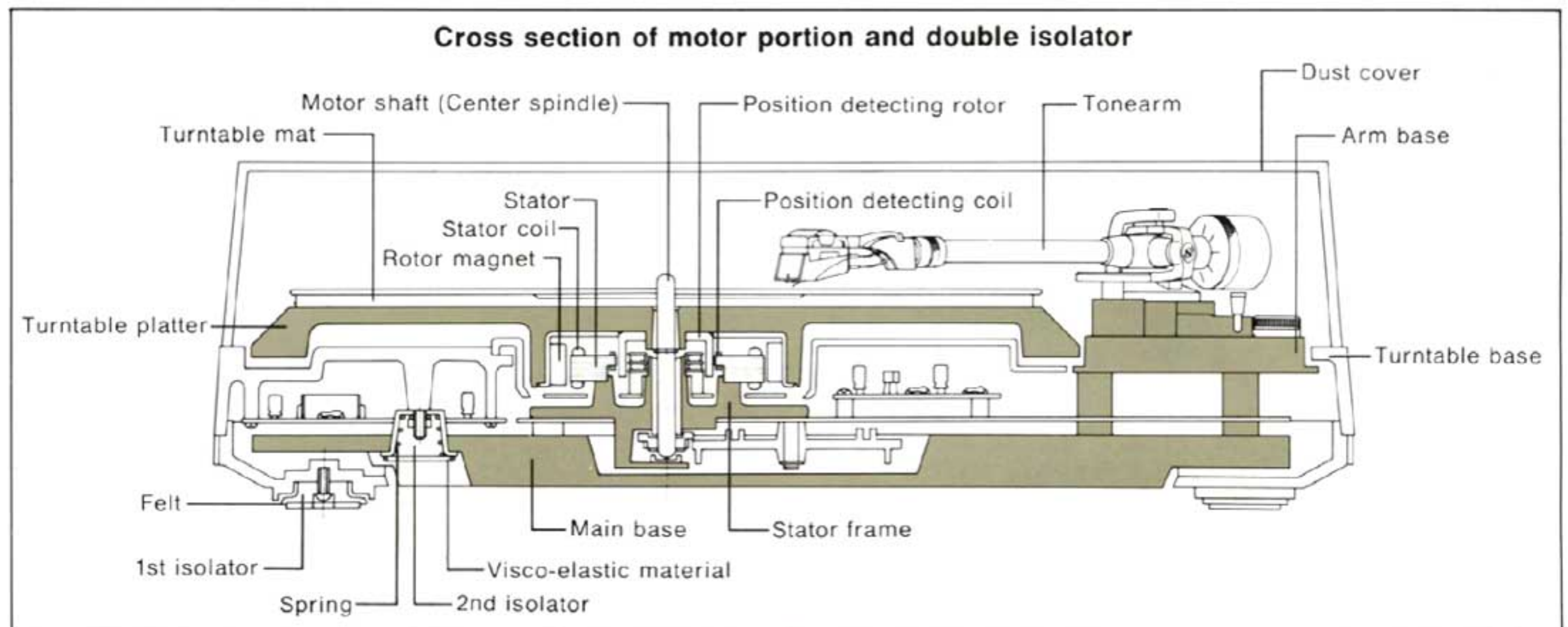
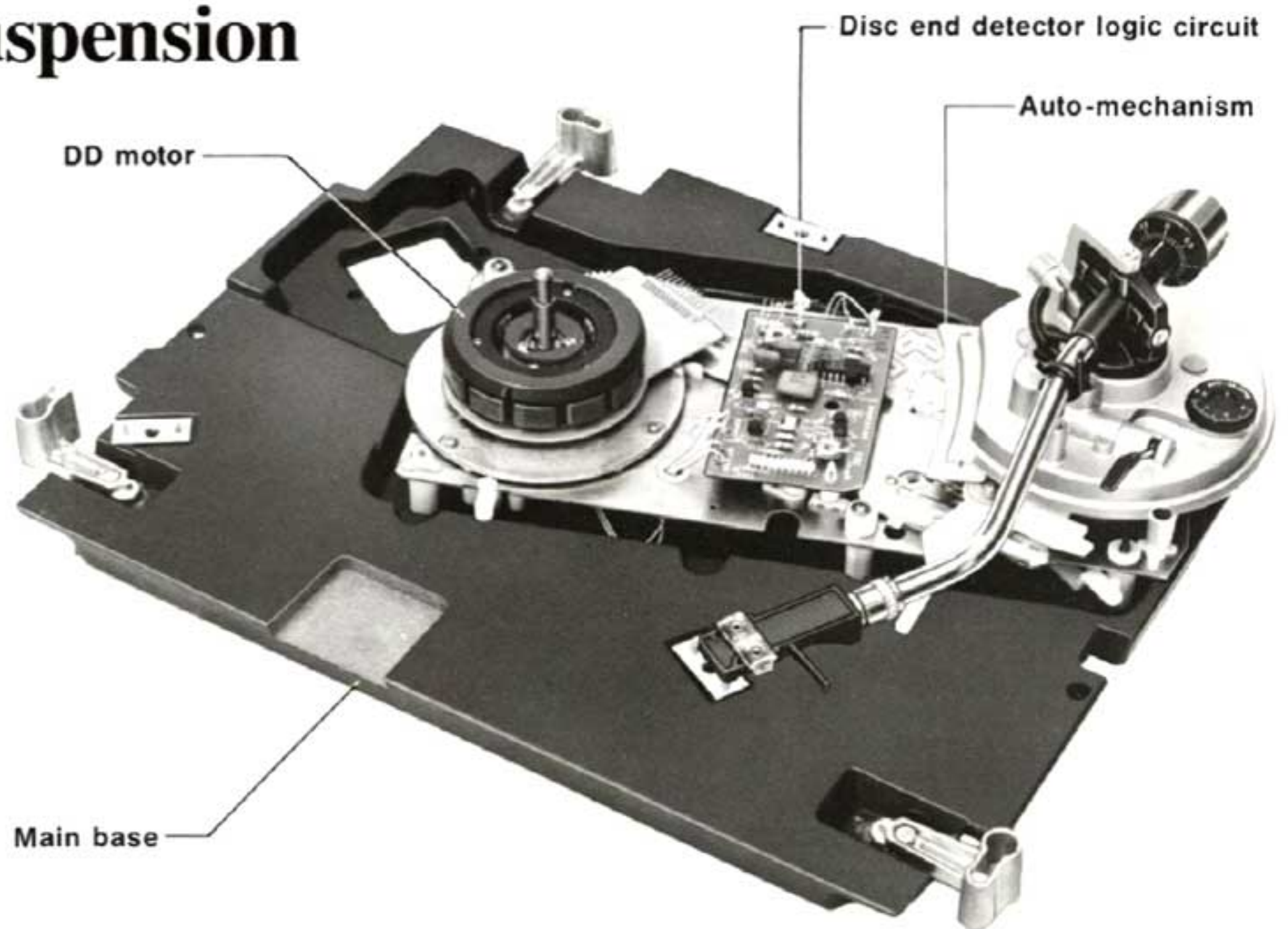
# Unique Anti-Vibration Techniques Solve the Acoustic Feedback Problem Once and For All

Thanks to new anti-vibration techniques, the problem of acoustic feedback has been solved. To eliminate all sources of vibration and achieve zero acoustic feedback, Technics approached the problem from two directions: from both inside and outside the unit. The result is a double isolated

system and a special base material. Together they effectively cut out all sources of vibration and acoustic feedback, allowing the turntable to be placed in almost any position without affecting its performance.

## Double Isolated Suspension System

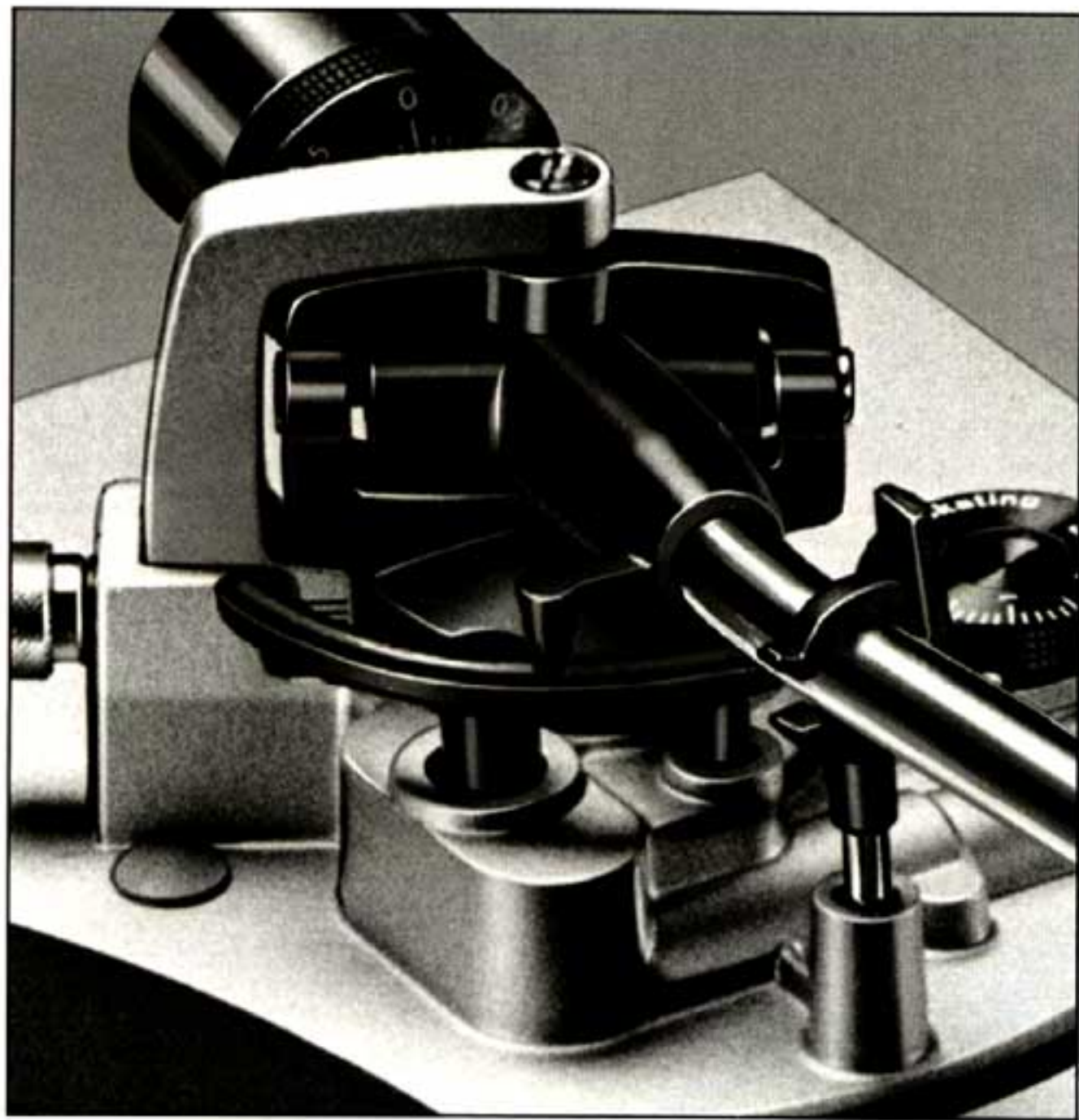
Two independent sets of isolators are employed to absorb vibration and cut out acoustic feedback. One set supports the heavy aluminum diecast turntable base. The other set is used to suspend the inner main base which is molded from a newly developed heavy anti-resonant fiberglass material and other inorganic compounds. The inner main base also supports the turntable, motor and tonearm assembly.



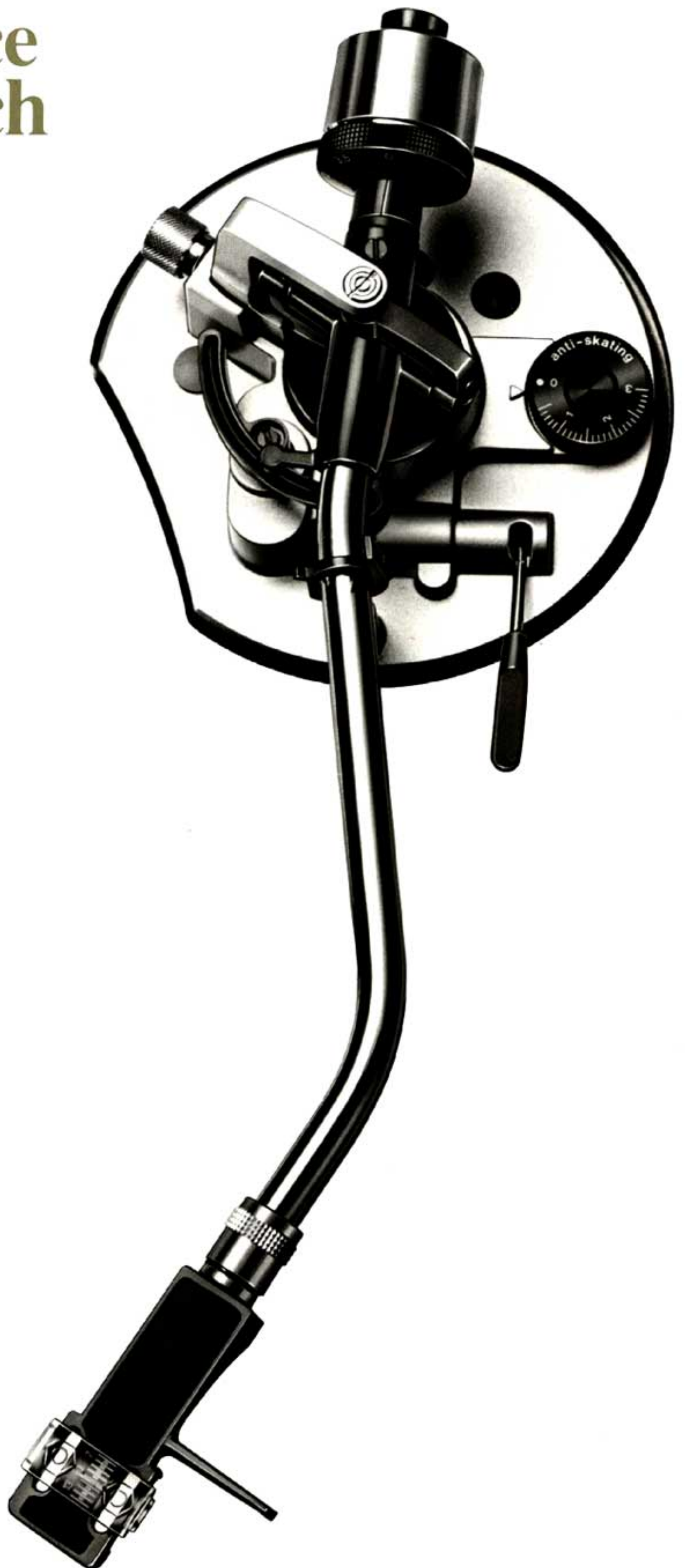


# High Performance Tonearm to Match Quartz Accuracy

The tonearm is yet another example of Technics' engineering genius. On the SL-1300MK2 it is a fully automatic type with sensitive gimbal suspension. It is so sensitive that it will respond to forces as small as 7 mg. Operation is smooth, clean and noise free, made possible by the use of mechanically silent, precision-molded, hard synthetic parts in the control mechanism: The auto-return system is activated by an optical sensor which detects the end of the disc, and it is controlled by advanced integrated circuit logic. All harmful and irritating noise, which occurs whenever the stylus is lowered onto or lifted off the disc, is automatically cut out by an output muting circuit. This is especially effective when manual cueing is performed. The tonearm is also equipped with a arm locking screw that permits height adjustment to suit all cartridge sizes.



Highly sensitive gimbal suspension







**Start Button**

Used to activate the platter and the automatic sequence selected.

**Speed Selectors**

Separate feather-touch pushbuttons are provided for 33- $\frac{1}{2}$  and 45 rpm speed selection.

**Stroboscope**

The strobe markings on the platter rim are visible through a special wide angle prism for easy viewing even in bright daylight.

**Stop Button**

Used to terminate the sequence and stop the platter at any time.

**Speed Indicator**

The selected speed is indicated in the LED digital display. For convenience, 33 is used to represent 33- $\frac{1}{2}$  rpm.

**Pitch Indicator**

The pitch variation in 0.1% increments up to 9.9% above and below the rated speed is indicated in the LED digital display with the appropriate plus or minus sign.

**Balance Weight with Direct Readout**

The tracking force is adjusted by means of this counterweight, and a calibrated ring scale on the weight provides a direct tracking force reading.

**Arm Locking Screw**

This screw permits a 6mm arm height adjustment to accommodate all cartridge sizes.

**Dust Cover Hinge**

Designed for easy installation and removal of the dust cover.

**Motor Shaft (Center Spindle)**

This precision-machined motor shaft also acts as the center spindle of the turntable.

**Rubber Mat for Maximum Disc Support**

Contoured to assure intimate disc contact, the heavy rubber mat provides maximum support even for slightly warped discs.

**Heavy Diecast Aluminum Platter**

A full 33cm in diameter, this uniquely constructed one-piece rotor-platter is made of heavy diecast aluminum to reduce wow and flutter.

**Low Silhouette Diecast Aluminum Base**







### Pitch Control Buttons

Separate plus and minus feather-touch pitch control buttons are provided. Each touch produces a  $\pm 0.1\%$  variation in the pitch. By keeping the respective button depressed, the pitch is continuously changed up to a maximum of  $\pm 9.9\%$  of the rated speed.

### Clear Button

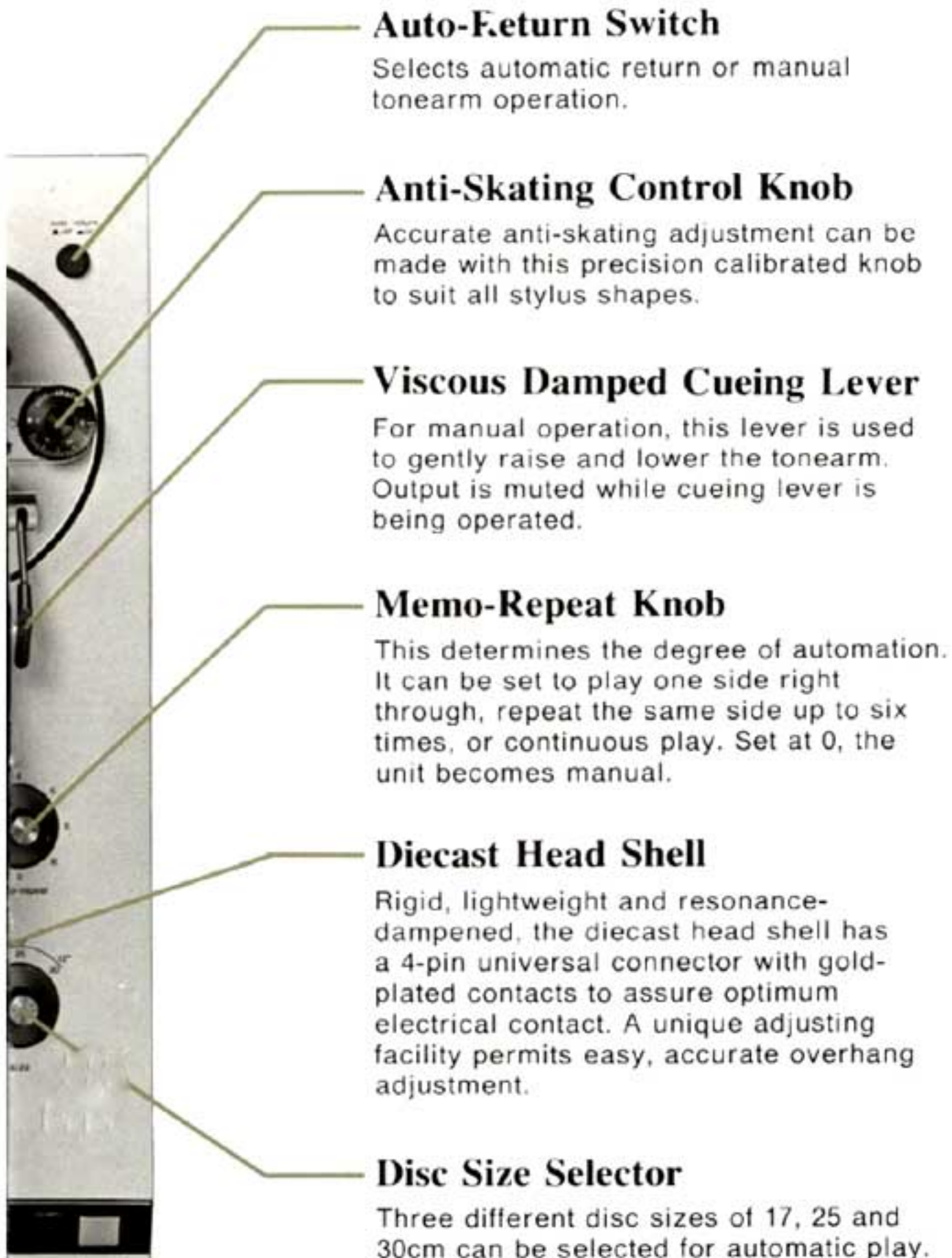
Used to cancel any previously set pitch variation and return the unit to normal speed.

### Power Switch

Used to supply power to the unit. In is ON and out is OFF.

## The Fully-Automatic SL-1300MK2. Its Features, Functions and Controls

The SL-1300MK2 offers every degree of automation including auto-cueing, auto-cut, auto-return, auto-disc size selection and memo-repeat. It can be set to take care of itself or operated manually with professional precision. Either way it offers the ultimate in operational simplicity and playing convenience.



### Auto-Return Switch

Selects automatic return or manual tonearm operation.

### Anti-Skating Control Knob

Accurate anti-skating adjustment can be made with this precision calibrated knob to suit all stylus shapes.

### Viscous Damped Cueing Lever

For manual operation, this lever is used to gently raise and lower the tonearm. Output is muted while cueing lever is being operated.

### Memo-Repeat Knob

This determines the degree of automation. It can be set to play one side right through, repeat the same side up to six times, or continuous play. Set at 0, the unit becomes manual.

### Diecast Head Shell

Rigid, lightweight and resonance-dampened, the diecast head shell has a 4-pin universal connector with gold-plated contacts to assure optimum electrical contact. A unique adjusting facility permits easy, accurate overhang adjustment.

### Disc Size Selector

Three different disc sizes of 17, 25 and 30cm can be selected for automatic play.

## The Semi-Automatic SL-1400MK2

Equipped with the same smooth, silent auto-return tonearm control mechanism and output muting circuit as the SL-1300MK2, the semi-automatic SL-1400MK2 meets most audiophile's needs. Automatic output muting cuts off irritating noise caused when the stylus is set down or lifted off the disc and is most effective when the tonearm is being manually operated with the cueing lever.

## The Manual SL-1500MK2

Designed specifically for the perfectionist who likes to be in full control of everything, the manual SL-1500MK2 is ideal for professional applications. It also features automatic output muting which is switched in whenever the cueing lever is operated.



# Percent-to-Cent Conversion Table

"Cent" as used in music is defined as one twelve-hundredth of a one-octave interval. A half tone interval thus is 100 cents. The following table permits conversion of percentages (as indicated on these turntables' digital pitch display) into cents and frequency factors.

Percentage Change	Cents	Frequency factor
+0.1	+1.73	1.001
+0.2	+3.46	1.002
+0.3	+5.19	1.003
+0.4	+6.91	1.004
+0.5	+8.63	1.005
+0.6	+10.36	1.006
+0.7	+12.08	1.007
+0.8	+13.79	1.008
+0.9	+15.51	1.009
+1.0	+17.23	1.010
+1.1	+18.94	1.011
+1.2	+20.65	1.012
+1.3	+22.36	1.013
+1.4	+24.07	1.014
+1.5	+25.78	1.015
+1.6	+27.48	1.016
+1.7	+29.18	1.017
+1.8	+30.89	1.018
+1.9	+32.58	1.019
+2.0	+34.28	1.020
+2.1	+35.98	1.021
+2.2	+37.67	1.022
+2.3	+39.37	1.023
+2.4	+41.06	1.024
+2.5	+42.75	1.025
+2.6	+44.44	1.026
+2.7	+46.12	1.027
+2.8	+47.81	1.028
+2.9	+49.49	1.029
+3.0	+51.17	1.030
+3.1	+52.85	1.031
+3.2	+54.53	1.032
+3.3	+56.21	1.033
+3.4	+57.88	1.034
+3.5	+59.56	1.035
+3.6	+61.23	1.036
+3.7	+62.90	1.037
+3.8	+64.57	1.038
+3.9	+66.23	1.039
+4.0	+67.90	1.040
+4.1	+69.56	1.041
+4.2	+71.23	1.042
+4.3	+72.89	1.043
+4.4	+74.55	1.044
+4.5	+76.20	1.045
+4.6	+77.86	1.046
+4.7	+79.51	1.047
+4.8	+81.17	1.048
+4.9	+82.82	1.049
+5.0	+84.47	1.050

Percentage Change	Cents	Frequency factor
+5.1	+86.12	1.051
+5.2	+87.76	1.052
+5.3	+89.41	1.053
+5.4	+91.05	1.054
+5.5	+92.69	1.055
+5.6	+94.33	1.056
+5.7	+95.97	1.057
+5.8	+97.61	1.058
+5.9	(#) +99.24	1.059
+6.0	+100.88	1.060
+6.1	+102.51	1.061
+6.2	+104.14	1.062
+6.3	+105.77	1.063
+6.4	+107.40	1.064
+6.5	+109.02	1.065
+6.6	+110.65	1.066
+6.7	+112.27	1.067
+6.8	+113.89	1.068
+6.9	+115.51	1.069
+7.0	+117.13	1.070
+7.1	+118.75	1.071
+7.2	+120.37	1.072
+7.3	+121.98	1.073
+7.4	+123.59	1.074
+7.5	+125.20	1.075
+7.6	+126.81	1.076
+7.7	+128.42	1.077
+7.8	+130.03	1.078
+7.9	+131.63	1.079
+8.0	+133.24	1.080
+8.1	+134.84	1.081
+8.2	+136.44	1.082
+8.3	+138.04	1.083
+8.4	+139.64	1.084
+8.5	+141.23	1.085
+8.6	+142.83	1.086
+8.7	+144.42	1.087
+8.8	+146.01	1.088
+8.9	+147.60	1.089
+9.0	+149.19	1.090
+9.1	+150.78	1.091
+9.2	+152.37	1.092
+9.3	+153.95	1.093
+9.4	+155.54	1.094
+9.5	+157.12	1.095
+9.6	+158.70	1.096
+9.7	+160.28	1.097
+9.8	+161.85	1.098
+9.9	+163.43	1.099

Percentage Change	Cents	Frequency factor
-0.1	-1.73	0.999
-0.2	-3.47	0.998
-0.3	-5.20	0.997
-0.4	-6.94	0.996
-0.5	-8.68	0.995
-0.6	-10.42	0.994
-0.7	-12.16	0.993
-0.8	-13.91	0.992
-0.9	-15.65	0.991
-1.0	-17.40	0.990
-1.1	-19.15	0.989
-1.2	-20.90	0.988
-1.3	-22.65	0.987
-1.4	-24.41	0.986
-1.5	-26.17	0.985
-1.6	-27.92	0.984
-1.7	-29.68	0.983
-1.8	-31.45	0.982
-1.9	-33.21	0.981
-2.0	-34.98	0.980
-2.1	-36.74	0.979
-2.2	-38.51	0.978
-2.3	-40.28	0.977
-2.4	-42.06	0.976
-2.5	-43.83	0.975
-2.6	-45.61	0.974
-2.7	-47.39	0.973
-2.8	-49.17	0.972
-2.9	-50.95	0.971
-3.0	-52.73	0.970
-3.1	-54.52	0.969
-3.2	-56.31	0.968
-3.3	-58.09	0.967
-3.4	-59.89	0.966
-3.5	-61.68	0.965
-3.6	-63.47	0.964
-3.7	-65.27	0.963
-3.8	-67.07	0.962
-3.9	-68.87	0.961
-4.0	-70.67	0.960
-4.1	-72.48	0.959
-4.2	-74.28	0.958
-4.3	-76.09	0.957
-4.4	-77.90	0.956
-4.5	-79.71	0.955
-4.6	-81.53	0.954
-4.7	-83.34	0.953
-4.8	-85.16	0.952
-4.9	-86.98	0.951
-5.0	-88.80	0.950

Percentage Change	Cents	Frequency factor
-5.1	-90.62	0.949
-5.2	-92.45	0.948
-5.3	-94.28	0.947
-5.4	-96.11	0.946
-5.5	-97.94	0.945
-5.6	(b) -99.77	0.944
-5.7	-101.60	0.943
-5.8	-103.44	0.942
-5.9	-105.28	0.941
-6.0	-107.12	0.940
-6.1	-108.96	0.939
-6.2	-110.81	0.938
-6.3	-112.65	0.937
-6.4	-114.50	0.936
-6.5	-116.35	0.935
-6.6	-118.21	0.934
-6.7	-120.06	0.933
-6.8	-121.92	0.932
-6.9	-123.78	0.931
-7.0	-125.64	0.930
-7.1	-127.50	0.929
-7.2	-129.36	0.928
-7.3	-131.23	0.927
-7.4	-133.10	0.926
-7.5	-134.97	0.925
-7.6	-136.84	0.924
-7.7	-138.72	0.923
-7.8	-140.59	0.922
-7.9	-142.47	0.921
-8.0	-144.35	0.920
-8.1	-146.24	0.919
-8.2	-148.12	0.918
-8.3	-150.01	0.917
-8.4	-151.90	0.916
-8.5	-153.79	0.915
-8.6	-155.68	0.914
-8.7	-157.58	0.913
-8.8	-159.47	0.912
-8.9	-161.37	0.911
-9.0	-163.27	0.910
-9.1	-165.18	0.909
-9.2	-167.08	0.908
-9.3	-168.99	0.907
-9.4	-170.90	0.906
-9.5	-172.81	0.905
-9.6	-174.73	0.904
-9.7	-176.64	0.903
-9.8	-178.56	0.902
-9.9	-180.48	0.901

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