

YAMAHA MC CARTRIDGE

MC-1X/MC-1S

Dynamic Moving Coil Cartridge • Yokeless Dual Differential Magnetic
Low-Mass Tapered Beryllium Tubular Cantilever • Low-Distortion
Laminated Coreless IC Coils • Die-Cast One-Body Construction
Resonance • Integrated Type (MC-1X) / Universal Type (MC-1S)

Audio/Hi-Fi



Yamaha: Dedication to Musical Excellence

We have many unique advantages in the audio world. Our wide range of technology, from electronics to metallurgy, enables us to develop for ourselves even the basic raw materials required for advanced hi-fi circuit designs. Another advantage is our musical heritage: Yamaha is founded on a dedication to music in all its forms. Our long experience as a leading manufacturer of musical instruments has

made sensitivity to musical sound a habit hard to break. Our uniqueness gives rise to the originality clearly reflected in the reliable Natural Sound performance of every Yamaha high fidelity product. In a word, we pride ourselves on a creative blend of musical artistry, science and craftsmanship. And not, with the introduction of the MC-1X/MC-1S cartridges, our Natural Sound Fidelity extends across the entire audio reproduction range, from input to output. Like all our high fidelity products, our new cartridges are the result of an enduring relation ship between musicians and audio engineers. Our designers and engineers are encouraged to create the kind of high fidelity products they want for themselves. With the result, at all times, being a total Dedication to Musical Excellence.

THE YAMAHA MC-1X/MC-1S: THE GENIUS OF ADVANCED MICROELECTRONICS FOR TRUE SOUND QUALITY

Tapered Tubular Beryllium Cantilever

For the first time in the world, Yamaha has succeeded in forming a tapered tubular cantilever from high-purity beryllium, the renowned metal known for its light weight, rigidity and indutlity. This new beryllium cantilever is much lighter and much more resilient too than other conventional "beryllium" versions, such as solid beryllium bars or aluminum bars with beryllium film evaporation deposited. Thickness of this tube? A mere 35 microns.

Twin Dual Coreless IC Coils

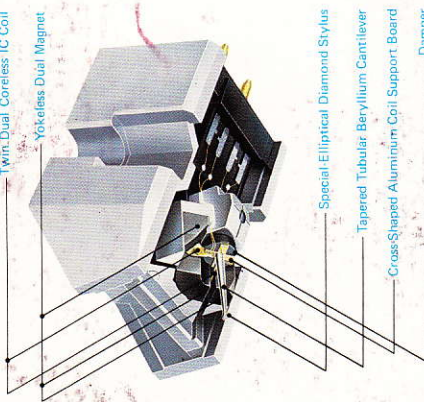
There are five distinctive features of the twin left/right moving coils in the Yamaha cartridge: each is low in mass, made of dual laminated construction, of an IC form, has no core, and is circular in form. The last feature is

especially significant since it relates closely to distortion and transducing efficiency. In the Yamaha cartridge, distortion and transducing loss is theoretically zero as the coils are then immersed in the most uniform magnetic flux. The coil base is made of silicon, and the mass of each coil itself is so light that its equivalent mass is a mere 0.03 milligrams!

"Root Wing" Coil Suspension System

A key cantilever question is where to mount the coil. If mounted too close to the stylus, the coil adds to the effective mass of the moving structure. And, when mounted midway at the "node of vibration," the coil is unnecessarily moved by the resonance frequency of the cantilever. Yamaha's decision was to mount the coil at the root of the cantilever. This means the coil won't suffer resonance, add much mass or collect dust and dirt.

Interior View



SPECIFICATIONS

Type	Moving Coil
Armature and Coil Materials	Pure silicon base plate/air-core, laminated IC aluminum film, sheet coil
Cantilever	Tapered, high-purity beryllium tube
Stylus	0.1mm square pure diamond
Stylus Tip	Special contour 8 x 40 micron ellipse
Magnetic Circuitry	Yoke-less, dual differential
Magnet	High energy capacity samarium cobalt magnet
Housing	Aluminum die-cast rigid body construction

Output Voltage	monoblock mold 0.2mV (1kHz 5cm/sec, peak 45)
Channel Separation	28dB or more (1kHz)
Electrical Impedance	30 ohms ±20% (right/left balance within 20%)
Frequency Response	10 - 20,000Hz (capacity = 60kHz)
Recommended Stylus Pressure	1.8g ± 0.2g
Weight	7.85g ± 0.1g (MC-1X = Integrated Type) 7.89g ± 0.1g (MC-1S = Universal Type)
Stylus Replacement	Factory replaced

Specifications subject to change without notice

Light, Solid Integrated Moving Structure

The stylus is a solid chip of diamond, 0.1mm square, polished to a special elliptical contour so that the harder crystalline axis may always be in contact with the record surface. It is then fitted into the hole in the tubular beryllium cantilever and bonded firmly. Vibrations from musical signals travel only through solid bodies—from the diamond stylus through the beryllium cantilever to the silicone coil. Sound is always rich and pure.

Precision One-Point Suspension

To more sharply define the fulcrum of vibration, we've suspended the cantilever by a special piano wire in the one-point suspension system. The piano wire itself is firmly connected to the solid brass holder for precise tension; the butyl rubber damper hugs the cantilever, retaining its resiliency in any ambient mode for many years.

Yokeless Dual Differential Magnetic Circuit

The magnetic circuit employs two sets of magnets for each channel in which the pole of one magnet faces that of another, but in reverse polarity. The entire magnet assembly is made of

samarium cobalt which features a very high energy product and extremely light weight; the mass of the cartridge is significantly reduced. This unique Yamaha differential magnetic circuit features lower distortion and greater transducing efficiency than conventional circuits. It also delivers a linear output since the magnetic flux it forms is straight and uniform.

Low Distortion, Low Crosstalk, High Efficiency

The design of this cartridge leads to untold musical benefits. Because (1) the magnetic flux is straight, (2) the coil is circular, and (3) rolling the moving structure of one channel doesn't generate spurious signals in the structure of another channel, there is no magnetic distortion or reduction in efficiency whatsoever. Crosstalk is negligible, also.

Integrated Type and Universal Type

This Yamaha cartridge is available in two versions: the integrated type MC-1X and universal type MC-1S. Both are solidly housed in die-cast casings to prevent resonance. Further, to avoid corrosion and assure maximum transfer of signals, coil leads are pure gold, while connectors and output terminals are all gold-plated. (The MC-1X connects only to tonearms of standard overhang.)

Diagram of Record Cutting Head

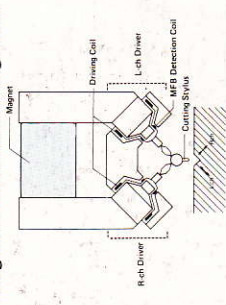
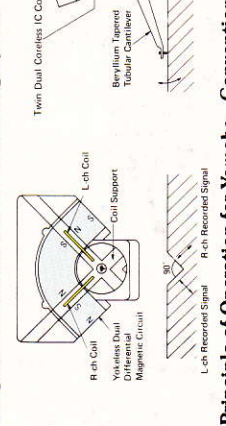
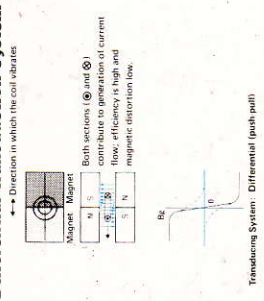


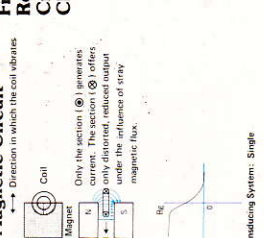
Diagram of MC-1X/MC-1S Generating System



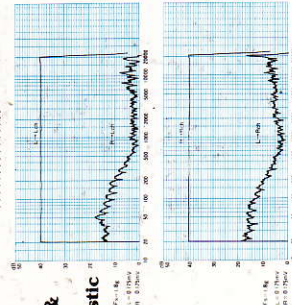
Principle of Operation for Yamaha Differential Transduction System



Conventional Single-Pole Magnetic Circuit



Frequency Response & Crosstalk Characteristic



For details please contact:

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