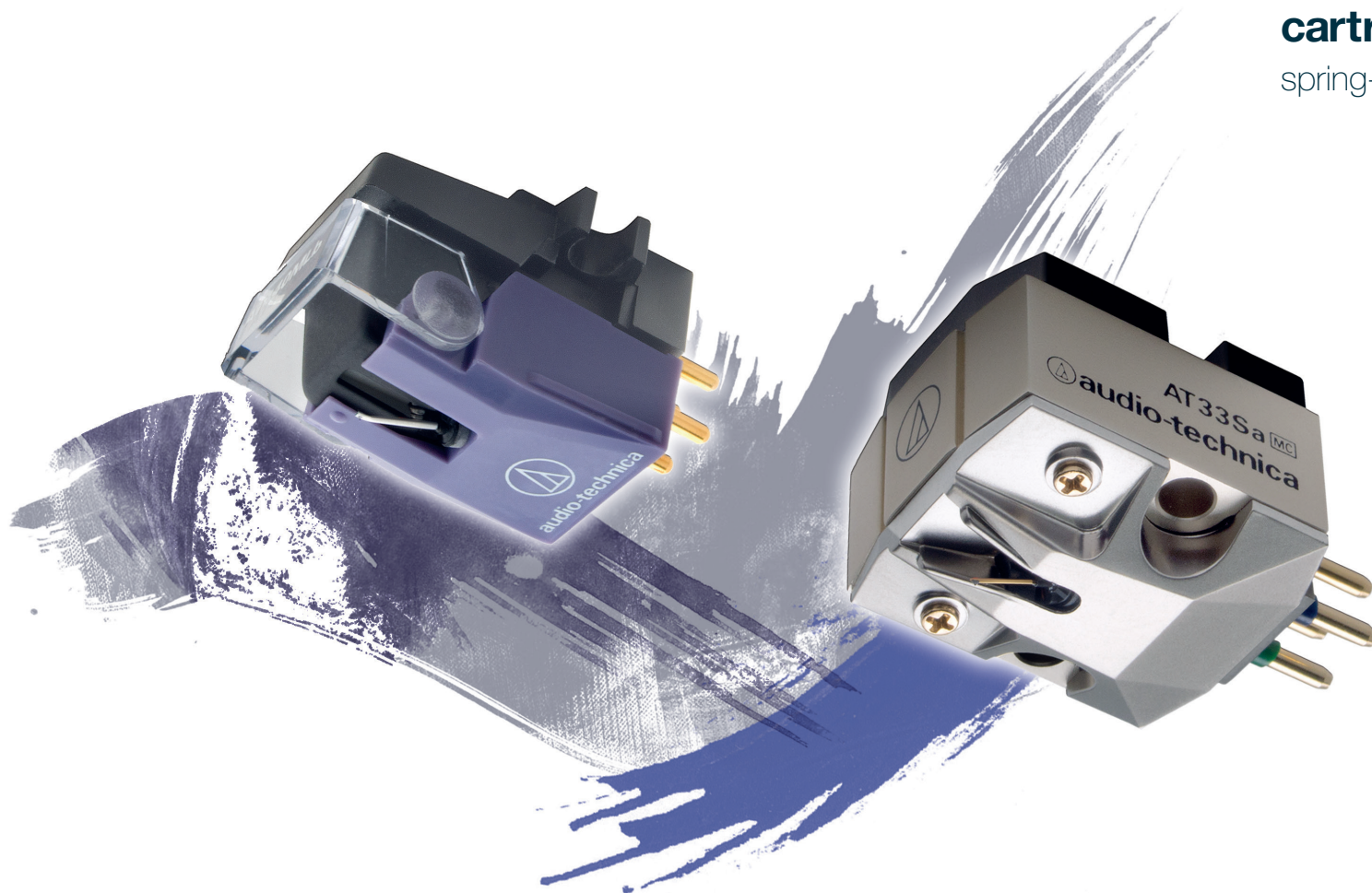


2015

cartridges catalogue
spring-summer edition



 **audio-technica**
always listening



The Early Years

When I started Audio-Technica in 1962, our first product introduction was the **AT-1** stereo cartridge. During that summer, the recording equipment & technology magazine, "Record Geijutsu", featured the **AT-1** cartridge in their special edition "All About Stereos". In the meantime, my brother-in-law introduced me to the head of Columbia Records who placed an order for 100 cartridges, the specifications of which were so stringent that it took us over a month to deliver!

At this time we were working in a single, rented room in Tokyo's Shinjuku 1-chome district – we'd started out with three employees, but that number had now grown to 20. We all worked late into each night, stopping only to eat dinner at a ramen noodle shop just in-front of the premises. We stayed there for two years before the need for more space took us to the third-floor of a building in the Higashi-Okubo district. Then just one year later we'd outgrown these premises and moved once more to our now headquarters at Naruse in the city of Machida.

Hideo Matsushita (1919- 2013)

Founder

Audio-Technica's first products from 1962, the **AT-1** and the **AT-3**, which quickly became best sellers in Japan. ▶



A portrait of Kazuo Matsushita, President of Audio-Technica Corporation. He is an older man with dark hair, wearing a dark suit, a light blue shirt, and a blue tie with a gold pattern. He is looking slightly to the right of the camera with a calm expression.

a message from the president

Dear Customer,

As president of Audio-Technica Corporation, I am very pleased to present our second Edition of our European catalogue dedicated to our full range of phono cartridges.

When my father, Hideo Matsushita, started the company in 1962, the first product he created was the AT1 phono cartridge. By the mid-70's, Audio-Technica was the largest manufacturer of phono cartridges in the world with an extensive product line-up, in addition to manufacturing cartridges for no fewer than 40 different global brands.

Since that time audio and entertainment has become highly digital but Audio-Technica has never ceased to innovate - not only through our range of analogue phono cartridges, but also in developing and producing two of the most important elements of the audio chain: microphones and headphones.

These two transducers, along with speakers, are arguably the most important link between any electro acoustic technology and the sound we hear or produce. We design microphones to capture the audio in its original acoustic form and we design headphones to reproduce the audio for you to enjoy.

I welcome people of my generation, born in the 40's, 50's and 60's to rediscover the natural sound that can only come from listening to their vinyl collection; and I welcome younger people born in the 70's, 80's and 90's to buy vinyl, listen to it and compare it to their CDs and MP3s favoured today.

I guarantee that all of you will rediscover, or perhaps discover for the first time, something unique that we can't write in our technical specifications: a level of emotion that will instantly captivate you.

This is due not only to the nature of analogue technology, but to the purity and the musicality of our cartridges, resulting from the passion of our design engineers benefiting from 50 years of technological heritage and the handcraftsmanship of our dedicated employees.

I would like to thank you personally for your interest in our product line and wish you many thousands of hours of pure listening pleasure from your Audio-Technica cartridge.

松下 和雄

Kazuo Matsushita

President
Audio-Technica Corporation

50 YEARS OFCARTRIDGES TECHNOLOGY

'62



The original company sign and logo from Audio-Technica's first workshop.

1962



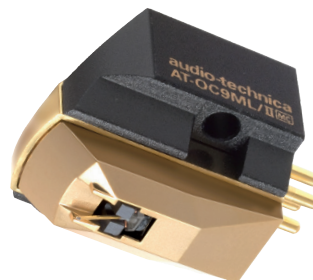
'69



60's



70's to 90's



2001



since 1962

2012



2013



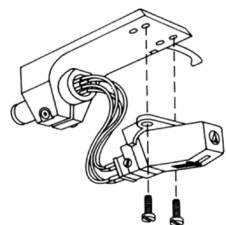
2015

21st century

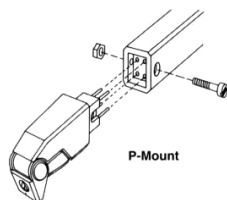


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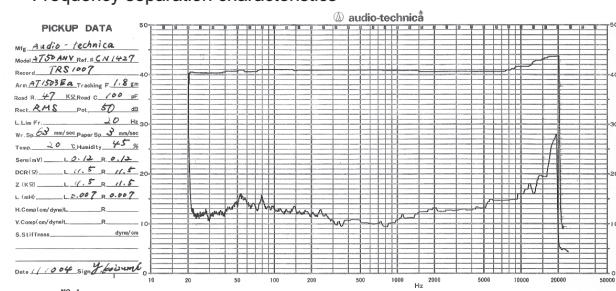


1/2" Mount Cartridge



P-Mount Cartridge

■ Frequency separation characteristics



Stress analysis photo shows the effect of a 2-gram tracking force. The elliptical stylus (left) contacts the groove in a concentrated area with high pressure. The MicroLine™ stylus (right) contacts the groove over a larger area, resulting in reduced pressure and less record wear.

Choosing the right cartridge

The ultimate performance potential of any record playing system is defined by the capabilities of its phono cartridge. Tonal balance, response range, clarity on musical peaks, stereo separation and imaging, along with freedom from noise and distortion are all affected at the outset. The selection of this first component is critical to the full enjoyment of the rest of your system.

Your choice of cartridge can also strongly affect the life of your records. With vinyl records becoming more and more difficult to replace, it's an important point to keep in mind when selecting a cartridge or upgrading your system.

Since Audio-Technica has long been recognized as a world leader in phonograph cartridge design and production, we offer a wide range of models designed to match turntable/tone arm requirements, performance levels and budget considerations. This brochure is intended to help make your decision easier by giving you as much information as possible. It will also give you specific "numbers" for all of our cartridges, with additional detailed information on our Audiophile Series. But no matter which model you select, we're confident you'll find your Audio-Technica cartridge to be outstanding value in every respect.

Choosing your cartridge format

Audio-Technica cartridges can be:

- **P-mount** (plug-in),
- **half-inch** mount (1/2")

• **P-mount cartridges** have four terminals at the back that simply plug in to the end of the tone arm. The cartridge is then secured to the tone arm with a single screw.

• **Half-inch mount cartridges** also have four terminals at the back, but they have larger pins that connect to four individual wires at the end of the tone arm. The cartridge is secured to the tone arm's headshell with two screws, spaced 1/2" apart.

Cartridges such as **AT311EP** and **AT300P** were originally P-mount design, though they can be used as 1/2" cartridges using the supplied half-inch adapter bracket **P20020**. These are called **Universal mount models** and are therefore compatible with both P-mount and half-inch mount tone arms.

The specifications (pages 14 - 15 - 24 and 25)

The most important specifications include frequency response, channel separation, channel balance and output level.

These "numbers" are an attempt to describe how your cartridge will perform, and how well it will meet your needs. **Frequency response** is a measure of the range of sounds that the cartridge will reproduce uniformly.

This "flatness" of response ensures that no frequencies are given over- or under-emphasis. And uniform response is a hallmark of Audio-Technica Vector Aligned cartridges, with even the least expensive units providing smooth reproduction within their stated ranges.

Channel separation is another key specification. It is the measure of how well one channel "ignores" the other stereo channel, so that you don't get right-side sound from your left-side speaker. It's measured in dB, and the higher the number, the separation. Separation is especially important at the higher frequencies, a region where Audio-Technica cartridges are particularly outstanding.

Channel balance is a measure of both production quality and good basic design. Both sides of a stereo cartridge should be equal loudness when equally recorded levels are present.



Output level is important in matching your cartridge to the electronics. Too low a level can result in noise, too high a level can over-drive a preamp into distortion. However, the output levels of all A-T Dual Magnet cartridges will work well with virtually any magnetic phono input.

There are a number of other measurements of phono cartridge performance, but in the final analysis, the most important characteristics to you will probably be **how well the cartridge performs audibly**, how it interfaces with your other system components, and how carefully it preserves your record library for future use.

Is tracking force important?

Yes, but not to the exclusion of other characteristics. Each cartridge (no matter who makes it) operates best in a particular range of tone arm tracking forces. It is important that this range is within the capabilities of your turntable if optimum performance is to be achieved. Keep in mind also that record wear goes up as pressure on the record surface increases. For a given tracking force, pressure on the groove wall will be highest with a small elliptical tip (say 0.2 x 0.7 mil) and lowest with a larger elliptical tip (say 0.4 x 0.7 mil), or even lower with a MicroLine™ stylus. But always stay within the recommended range. Tracking too light can cause as much (or more) damage as tracking too heavy.

Understanding styli shapes, shank shapes and constructions

	Dual Moving Coil Cartridges	Dual Moving Magnet VM Cartridges
Shibata  Nude Square Shank	AT33sa (page 10)	
MicroLine™  Nude Square Shank	AT-OC9ML/II (page 7) AT33PTG/II (page 11)	AT150MLX (page 18) AT440MLb (page 19)
LineContact  Nude Square Shank	AT-OC9/III LTD (page 6) AT-OC9/III (page 7) AT-ART9 (page 8) AT-ART7 (page 9)	
Elliptical  Nude Square Shank	AT33EV (page 11) AT-F7 (page 12) AT-F2 (page 12)	
Conical  Nude Round Shank	AT33MONO (page 13)	
Elliptical  Nude Round Shank		AT120Eb (page 19)
Elliptical  Bonded Round Shank		AT100E (page 20) AT95E (page 21) AT311EP (page 23)
Conical  Bonded Round Shank	AT-MONO3/LP (page 13) AT-MONO3/SP (page 13)	AT5V (page 20) AT91 (page 21) AT3482P (page 22) AT300P (page 22)

Audio-Technica offers two main series of cartridges, **moving coil and moving magnet**.

Four different diamond stylus shapes : **MicroLine™**, **Line Contact**, **Elliptical**, **Shibata** and **Conical**.
 Three different stylus constructions : **Nude Square Shank**, **Nude Round Shank** and **Bounded Round Shank**.

Styli shapes : MicroLine™, Line Contact, Elliptical, Shibata and Conical.

The MicroLine™ stylus almost exactly duplicates the shape of the cutting stylus used to produce the original master disc. This enables it to track portions of the groove other styli cannot reach, resulting in extremely accurate tracking of high frequency passages and ruler-flat frequency response within the audible range. The unique multi-level shape wears more evenly, allowing greatly extended record and stylus life.

The Line Contact stylus next to the MicroLine™, offers the optimum tip design for high frequency response with minimum abrasion, providing low distortion and low record wear.

The Elliptical stylus has two radii, the front radius being wider than the side radius. This allows the stylus to ride in the center of the groove, like the conical, while the smaller side radius can more accurately track higher frequencies.

Elliptical styli are available in two sizes - 0.2 x 0.7 mil⁽¹⁾ and 0.3 x 0.7 mil- with the first number indicating the side radius.

The smaller the side radius, the better the sound quality will be.

The Conical stylus is the simplest, least expensive and most widely used stylus. Its spherical tip, which has a typical radius of 0.6 mil, normally touches the center of the record groove walls.

The conical design works best in moderate to lower priced, and older, record players with a tone arm imposing higher tracking forces, or tone-arm not featuring cartridge tilt adjustment.

Typical radius of conical stylus for 78rpm records is 2.5 mil (page 14), four times bigger than LP record conical styli.

Stylus shank construction : **Nude or Bonded Styli**

Nude styli, shaped from whole diamonds, are more costly than bonded styli, with their diamond tips “bonded” to metal shanks before finishing.

But because of their lower mass, nude styli track more accurately.

Also, since our nude styli are grain-oriented, with their longest-wearing faces touching the record surface, they last longer.

Stylus shank form factor : **Square Shank or Round Shank**

Square-shank nude styli cost even more than round shank nude styli to make, but mounting them in laser-cut square holes in the cantilever locks them precisely in correct alignment with record grooves.

Which cartridge is best? Moving coil or moving magnet?

Many serious audiophiles prefer moving coil designs, citing clarity and transparency of tone, better defined transients, precise stereo imaging and lower distortion as the reason for their preference.

Please note that moving coil cartridges require preamps with special compatible inputs (MC phono inputs). The output level of MC cartridges is between 0.2mV to 0.5mV, therefore MM phono inputs designed for cartridges delivering around from 3mV to 5mV cannot accommodate moving coil cartridges.

Moving magnet cartridges are more robust, also their stylus assemblies are field-replacable.

⁽¹⁾ The abbreviation mil is equal to a thousandth of an inch - mil = 0,001 inch = 0,0254 mm = 25,4 μm

limited edition

Limited edition moving coil cartridge specification

Model Number	AT-OC9/III LTD
	
Type	Dual Moving Coil
Body Material	Titanium (Aluminium for AT-OC9/III)
Frequency Response	15 to 50,000 Hz
Channel Separation	30 dB (1 kHz)
Output Channel Balance	0.5 dB (1 kHz)
Output	0.4 mV (at 1 kHz, 5 cm/sec)
Vertical Tracking Angle ⁽¹⁾	23 degrees
Vertical Tracking Force Range	1.8 to 2.2 g (standard 2.0g)
Stylus Shape	Line Contact Stylus
Stylus Size	40 x 7 µm
Stylus Construction	Nude square shank
Cantilever	0.26 mm Ø solid boron
Static Compliance	35 x 10 ⁻⁶ cm / dyne
Dynamic Compliance	18 x 10 ⁻⁶ cm / dyne (100 Hz)
Wire Used for Coil	PCOCC (see note n°3)
Terminal Pins	PCOCC (see note n°3)
Recommended Load Impedance	Min 100 Ω (see note n°4)
Coil Impedance	12 Ω (1 kHz)
DC Resistance	12 Ω
Coil Inductance	25 µH (1 kHz)
Cartridge Weight	10.5 g
Dimensions	17.3 (H) x 16.8 (W) x 25.7 (L) mm
Mounting	1/2" centers
Replacement Stylus	(see note n°2)
Accessories Included	Non-magnetic screw driver; 1 brush; 2 washers; 2 x 12 mm mounting screws; 2 x 18 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6106) (standard AT-OC9/III is delivered with AT6101)

⁽¹⁾ Vertical tracking angle of 20 degrees is IEC/DIN standard.

⁽²⁾ When the stylus is to be replaced, replace the entire cartridge. Take the used cartridge to your Audio-Technica Authorized Service Center.

The new cartridge, or any other model which is desired among the line-up of MC cartridges sold by Audio-Technica is available at the stylus replacement price (contact Audio-Technica Authorized Service Center).

⁽³⁾ PCOCC = Pure Copper by Ohno continuous casting process.

⁽⁴⁾ When head amplifier is connected.

Limited edition AT-OC9/III LTD titanium body MC cartridge (PC 104-MC 520)

AT-OC9/III LTD

EAN 4961310117368

Limited edition pure titanium version of AT-OC9/III cartridge

• Machined pure titanium base

The base that supports the magnetic circuit and vibration system is made of precisely machined pure titanium materials. This enables it to serve as a solid base to support stable playback capability.

• Quad hybrid lead wire

Quad hybrid lead wires with a balanced blend of gold clad, **7N-OFC**, **PCOCC** and **OFC** are used in pursuit of the ideal balance with the main cartridge unit.

• Special line contact stylus and solid boron cantilever with a 0.26 mm diameter

The cartridge features a special line contact stylus with a 40µm x 7µm curvature radius at the stylus tip. This not only ensures that the music signals engraved in the analogue records will be read out completely, but also it gives expression to the highest dynamic compliance of the series. By firmly embedding this line contact stylus in a solid boron cantilever with its 0.26 mm diameter and by bonding it in place, the music signals read by the tip of the stylus are transmitted reliably to the power-generating coils.

• Neodymium magnet and permendur yoke drastically increase the magnetic energy

The magnet is a neodymium magnet with a maximum energy product BHmax of 50[kJ/m³] while used as the yoke is a permendur yoke with a high saturation flux density and excellent magnetic materials. Together, they further boost the magnetic field concentrated in the coil gap area.

• PCOCC used for coils and terminal pins

PCOCC does not give rise to crystalline interfacing in the transmission direction so audiophiles can enjoy pure transmissions.

• VC mold for minimizing unnecessary vibration

The VC mold that holds the coils in place is made of a hard synthetic resin which is combined with potassium titanate for increased strength and rigidity.



AT-OC9/III LTD was produced in 2012-2013 as the limited edition improved version of AT-OC9/III.

This cartridge is no longer in production (Limited Edition).

During 2014, this cartridge may still be available from high-end audiophile specialists who purchased this prestigious model for their inventory.



AT-OC9/III LTD

LineContact



Nude Square Shank

PCOCC

Pure Copper by Ohno Continuous Casting process

(Mono-crystalline high-purity oxygen-free copper)

AT-OC9 Series cartridges (PC 104-MC 520)

The **AT-OC9**, launched in 1987, was the original cartridge model from which the **AT-OC9ML/II** and **AT-OC9/III** evolved. Over the years, the **AT-OC** series has undergone a number of model changes and it has continued to be a bestseller for over twenty years. While drawing on the basic design of the **AT-OC9ML/II** which has been available exclusively in overseas markets and received high critical acclaim, a fresh approach for the **AT-OC9/III** which caused us to review the stylus tip, cantilever, magnetic circuit parts, damper and other aspects in order to track down and embody the highest sound quality.

AT-OC9/III

EAN 4961310106843

Dual moving coil stereo cartridge with line contact stylus

Flagship model embodying the highest sound quality ever in the series

- **Special line contact stylus and solid boron cantilever with a 0.26 mm diameter**

The cartridge features a special line contact stylus with a $40\mu\text{m} \times 7\mu\text{m}$ curvature radius at the stylus tip. This not only ensures that the music signals engraved in the analogue records will be read out completely but also it gives expression to the highest dynamic compliance of the series. By firmly embedding this line contact stylus in a solid boron cantilever with its 0.26 mm diameter and by bonding it in place, the music signals read by the tip of the stylus are transmitted reliably to the power-generating coils.

- **Neodymium magnet and permendur yoke have drastically increased the magnetic energy**

The magnet is a neodymium magnet with a maximum energy product BH_{max} of 50[kJ/m³] while a permendur yoke is used with a high saturation flux density and excellent magnetic materials. Together, they further boost the magnetic field concentrated in the coil gap area.

- **PCOCC used for coils and terminal pins**

PCOCC does not give rise to crystalline interfacing in the transmission direction so audiophiles can enjoy pure transmissions.

- **Dual moving coil with high separation and wide response**

Our unique moving coil type cartridge has a basic structure where one cylindrical coil is used for the left channel and another is used for the right channel. This structure by which power is generated independently for the left and right channels physically provides outstanding separation characteristics. The **AT-OC9/III** adopts a reverse V-shaped formation for the two left and right coils to reduce the vibration mass as seen from the stylus tip and minimize the unnecessary movement of the coils to further diminish the distortion.

- **VC mold for minimizing unnecessary vibration**

The VC mold that holds the coils in place is made of a hard synthetic resin which is combined with potassium titanate for increased strength and rigidity.

- **Rugged body dedicated to achieving a design with increased rigidity**

Using a precision-crafted sturdy aluminium alloy as the base, the body's structure is made of hard resin keep parasitic resonance down to a minimum. This minimizes undesirable vibration while the bottom of the body is plated to achieve greater rigidity and an improved signal-to-noise ratio.

AT-OC9ML/II

EAN 4961310063894

Dual moving MicroCoil™ stereo phono cartridge

The **AT-OC9ML/II** Dual Moving MicroCoil™ cartridge is a significant achievement in precision manufacturing, with tolerances held to mere thousandths of an inch. Stringent quality control assures that these tolerances, as well as performance criteria, are maintained by every **AT-OC9ML/II** cartridge. In addition, the **AT-OC9ML/II** features:

- Dual-coil system for maximum channel separation.
- High-flux samarium cobalt magnet for improved electrical generation.
- PCOCC coil windings for low-loss "transparent" signal transmission.
- Gold-plated solid boron cantilever.
- **MicroLine™ stylus.**

moving coil cartridges



moving coil cartridges



PCOCC
Pure Copper by Ohno Continuous Casting process
 (Mono-crystalline high-purity oxygen-free copper)

Magnetic core MC type stereo cartridge (PC 104-MC520)

AT-ART9

EAN 496131022713

Magnetic core MC cartridge

- **Audio-Technica's flagship magnetic core MC type cartridge with very high quality magnetic circuit.**

The **AT-ART9** inherits the basic magnetic design from the **AT50ANV**, which was developed as our 50th anniversary model. Also, it reproduces the highest-quality sound using the vibration system from the **AT-OC9/III**.

- **Neodymium magnet and permendur yoke drastically increase the magnetic energy**

A neodymium magnet is employed with a maximum energy product BH_{max} of 50 [kJ/m³] whilst a permendur yoke is used with a high saturation flux density and excellent magnetic materials.

- **Hybrid body that reduces unnecessary parasitic resonance**

The housing is made of machined aluminium materials and the cover is made of hard plastic materials. This disperses parasitic resonance and results in clear sound quality.

- **Machined aluminium base**

The base that supports the magnetic circuit and vibration system is made of machined aluminium material. This enables it to serve as a solid base to support stable playback capability.

- **High-separation, wide-response dual moving coil**

The basic structure is an original MC type, with separate cylindrical coils to the left and right channels. Since power is generated independently in each of the left and right channels, this structure offers truly superior separation. If the signal from the opposite channel escapes, this can cause intermodulation distortion and have a decisive impact on audio quality and how the stereo sound spreads. The structure of this product ensures a clear and smooth sound. Additionally, the two coils have a reverse-V shape which reduce effective moving mass as seen from the stylus tip, limiting unnecessary movement of the coil and further eliminating distortion.

- **Special line contact stylus and solid boron cantilever with a 0.26 mm diameter**

The stylus tip is a special line contact type with a $40\text{ }\mu\text{m} \times 7\text{ }\mu\text{m}$ curvature radius (used in the **AT50ANV**) and a solid boron cantilever with a 0.26 mm diameter. This allows accurate transfer of music signals read by the stylus tip to the magnetic coil.

- **High-sound-quality brass mounting screws**

Two brass mounting screws are provided to attach the cartridge to the shell. They are optimally suited to the high sound quality of the cartridge itself.

- **PCOCC coil**

The PCOCC coil enables purer transmission because it does not produce grain boundaries in the direction of the transmission.

Non-magnetic core MC type stereo cartridge (PC 104-MC 520)

AT-ART7

EAN 4961310118488

Non-magnetic core MC cartridge

- **Non-magnetic core MC type cartridge based on commemorative model AT50ANV.**

This product keeps the basic design of non-magnetic core MC type cartridge **AT50ANV** and changes the coil winding frame from a pure titanium armature to a newly developed liquid crystal polymer armature by an injection molding. This product also succeeds in reducing the weight of the vibration system compared to **AT50ANV** and provides the extremely natural and clear sound quality with the ability to express three-dimensional sound fields inherent to non-magnetic core types. In addition, this product enables an output voltage of 0.12mV, a relatively high output level for a non-magnetic core system.

- **Liquid crystal polymer armature**

Liquid crystal polymer used for the coil winding frame not only has an extreme mechanical strength but also a unique property which increases the mechanical strength as the product becomes thinner. Therefore it is a most suitable material for the vibration system of cartridges. This has high intensity and vibration absorption properties, enabling high-quality sound by suppressing unwanted vibration from power generation.

- **Newly designed magnetic circuit that maximizes magnetic energy**

The magnetic circuit of this product uses a large-sized neodymium magnet with approximately twice the volume of conventional Audio-Technica ferrite core MC types. (Maximum energy product BHmax: 50 [kJ/m³]) The permendur magnetic circuit parts located around the magnet have also been newly designed to maximize the strength of the intensive magnetic field in the coil gap. This magnetic circuit increases the output voltage, and also enhances playback capability in the medium-to-low-frequency range that is said to be a weak point of conventional non-magnetic core MC types. This provides a very accurate frequency response.

- **Special line contact stylus and solid boron cantilever with a 0.26 mm diameter**

The stylus tip is a special line contact type with a 40μm x 7μm curvature radius (used in the **AT50ANV**) and a solid boron cantilever with a 0.26 mm diameter. This allows accurate transfer of music signals read by the stylus tip to the power generating moving coils.

- **Machined aluminium base**

The base that supports the magnetic circuit and vibration system is made of machined aluminium material. This enables it to serve as a solid base to support stable playback capability.

- **Hybrid body that reduces unnecessary parasitic resonance**

The housing is made of machined aluminium materials and the cover is made of hard plastic materials. This disperses parasitic resonance and results in clear sound quality.

moving coil cartridges

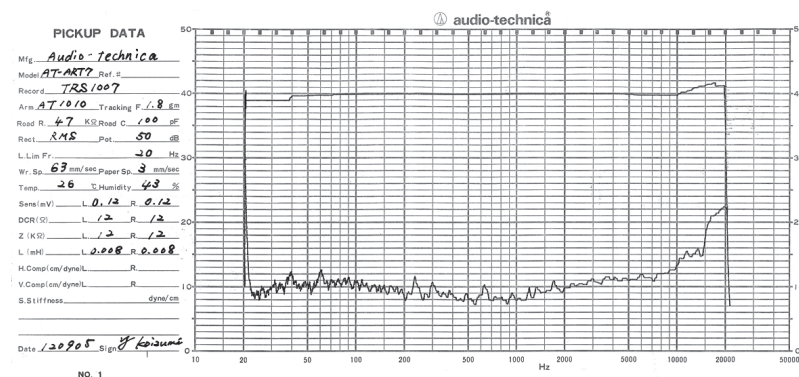


AT-ART7

PCOCC

Pure Copper by Ohno Continuous Casting process
(Mono-crystalline high-purity oxygen-free copper)

Frequency separation characteristics



moving coil cartridges



AT33sa cartridge (PC 104-MC 520)

AT33sa

EAN 496130128968

Dual moving coil stereo cartridge with Shibata stylus

• MC cartridge with Shibata stylus

The **AT33sa** is the first Audio-Technica MC cartridge model to feature a Shibata stylus.

In addition to its superior high-range performance as a line-contact stylus, the Shibata stylus produces mid and bass sound that is strong and rich.

The Shibata stylus is mounted on a boron cantilever with a double damper to greatly improve sound quality.

• Advanced tapered boron cantilever and reduced weight

The **AT33sa** uses a tapered boron cantilever. Tapering the cantilever and revising the number of coil rotations reduce the weight, giving the cartridge better high range performance and wide range reproduction.

• Neodymium magnet with dramatically enhanced magnetic energy and permendur yoke

The model uses a neodymium magnet with maximum energy product BHmax of 50 [kJ/m³] and a permendur yoke with high saturation flux density and outstanding magnetic properties, which further enhances the concentrated magnetic field of the coil gap.

• PCOCC coil

The PCOCC coil enables purer transmission because it is not subject to grain boundaries in the direction of transmission.

*PCOCC = Pure Copper by Ohno Continuous Casting process (Mono-crystalline high-purity oxygen-free copper)

• High-separation, wide response dual moving coil

The basic structure is an original MC type, with separate cylindrical coils to the left and right channels. Since power is generated independently in each of the left and right channels, this structure offers truly superior separation. If the signal from the opposite channel escapes, this can cause intermodulation distortion and have a decisive impact on audio quality and how the stereo sound spreads. The structure of this product ensures a clear and smooth sound. Additionally, the two coils have a reverse-V shape which reduces effective moving mass as seen from the stylus tip, limiting unnecessary movement of the coil and further eliminating distortion.

• VC mold limits unnecessary vibration

The VC mold that affixes the coils is made with hard synthetic resin containing potassium titanate to make it highly strong and rigid. This improvement results in a lighter product, which reduces unnecessary vibration.

• A tough body designed to be rigid

The product's housing is made of precision-cast hard aluminum alloy. Hard synthetic resin sandwiching in the structure on the top and bottom suppresses parasitic resonance. This minimizes unnecessary noise while enhancing rigidity and the signal-to-ratio.

AT33 Series cartridges (PC 104-MC 520)

Common features of AT33EV and AT33PTG/II

- **Neodymium magnet with dramatically enhanced magnetic energy and permendur yoke**

The model uses a neodymium magnet with maximum energy product BHmax of 50 [kJ/m³] and a permendur yoke with high saturation flux density and outstanding magnetic properties, which further enhances the concentrated magnetic field of the coil gap.

- **PCOCC coil** enables purer transmission because it is not subject to grain boundaries in the direction of transmission.

- **10 Ω middle impedance specifications**

Loss that occurs as a result of electrical resistance components of a coil is referred to as copper loss. To minimize copper loss, this product has set impedance of 10 Ω. The output voltage of 0.3 mV is easy to use.

- **VC mold limits unnecessary vibration**

The VC mold that affixes the coils is made with hard synthetic resin containing potassium titanate to make it highly strong and rigid. This improvement results in a lighter product, which reduces unnecessary vibration.

- **A tough body designed to be rigid**

The product's housing is made of precision-cast hard aluminium alloy. Hard synthetic resin sandwiching in the structure on the top and bottom suppresses parasitic resonance. This minimizes unnecessary noise while enhancing rigidity and the signal-to-noise ratio.

- The **AT33 series'** traditional double dampers supporting the vibration system have also been renewed and carefully selected to allow rich bass reproduction.

AT33EV

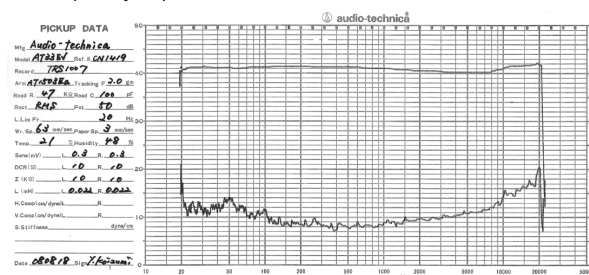
EAN 4961310103972

Dual moving coil stereo cartridge with elliptical stylus

- **Elliptical stylus chip and hard duralumin tapered pipe cantilever**

The big advantage to the elliptical chip is its ability to richly reproduce sounds in the medium and low ranges. This elliptical chip is embedded into a hard duralumin tapered pipe cantilever. With its outstanding machine strength, the duralumin cantilever is tough enough for the job and produces natural sounds without distortion. The cantilever of this product, moreover, goes through a tapering process to harden it, making it faster to transmit sound than conventional duralumin cantilevers and producing unsurpassed response. Supporting this cantilever fulcrum with the traditional double damper disperses resonance, enables stable tracing and achieves linear frequency characteristics.

Frequency separation characteristics



- **"Hanenite" vibration-controlling rubber minimizes unnecessary vibration**

The vibration-controlling rubber "hanenite" is used in the housing interior and the cantilever fulcrum support to minimize unnecessary vibration. The body structure, designed to be rigid and suppress vibration, allows the outstanding basic performance of the dual moving coil to fully express itself.



Elliptical



Nude Square Shank

AT33PTG/II

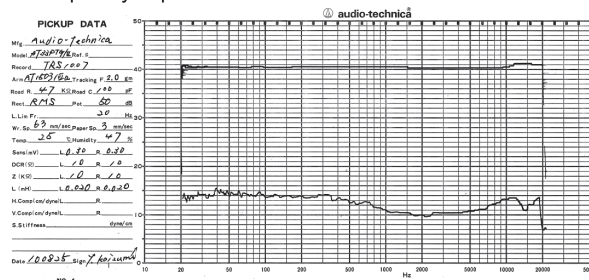
EAN 4961310111182

Dual moving coil cartridge with Micro linear stylus

- **Advanced nude tapered boron and weight reduction**

This model succeeds in thinning down and shortening the cantilever, compared to the AT33PTG. The coil impedance is also refined from 17 Ω to 10 Ω. We realized significant weight reduction of the vibration system and successfully improved the basic performance and sound quality of the cartridge.

Frequency separation characteristics



- **High performance and long-life Micro linear stylus**

Micro linear (ML) is a specially polished line contact stylus. This has a better high range performance than the conical or elliptical stylus due to its small curvature radius and realizes low distortion and expanding high range reproduction even when playing at the inner circumference of records. And the constancy of the line contact shape is one of its main features with an average product lifetime of around 1,000 hours.



MicroLine™



Nude Square Shank

moving coil cartridges

AT-F7 and AT-F2 dual moving coil stereo cartridges (PC 104-MC 520)



Elliptical

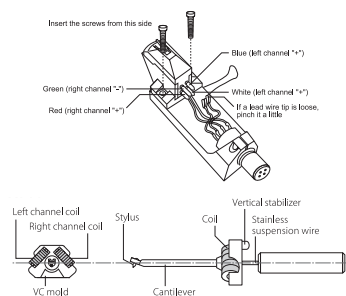


Nude Square Shank

AT-F7

PCOCC

Pure Copper by Ohno Continuous Casting process
(Mono-crystalline high-purity oxygen-free copper)



AT-F7

EAN 4961310106850

Common features of AT-F7 and AT-F2

The cartridges **AT-F7** and **AT-F2**, with a high-quality sound comparable to more expensive models, provides outstanding value and performance, which delights those who appreciate the sound quality of analogue records.

• Diameter stainless suspension wire

The **AT-F7** and **AT-F2** uses 0.07 mm diameter stainless suspension wire, which serves an important role as a fulcrum point for audio signal transfer. This stainless wire is used for higher-quality MC-type cartridges. This stabilizes the fulcrum position and enables auditory lateralization to provide excellent expression of the high-frequency range.

• Neodymium magnet for dramatically increased magnetic energy

The neodymium magnet provides maximum energy (BHmax of 50[kJ/m³]), while the pure iron yoke provides excellent properties. Together, they further boast the magnetic field concentrated in the coil gap area.

• PCOCC used for coils and terminal pins

PCOCC does not give rise to crystalline resistance in the transmission direction, enabling audiophiles to enjoy pure transmissions.

• Dual moving coil with high separation and wide response

Our unique moving coil type cartridge has a basic structure where one cylindrical coil is used for the left channel and another is used for the right channel. This structure by which power is generated independently for the left and right channels physically provides outstanding separation characteristics. The leakage of signals from one channel into the other exerts a decisive influence on the stereo expanse as well as on the sound quality. This is because this leakage is tantamount to creating irregular cross modulation. The reason why the dual moving coil system delivers such a clear and finely delineated sound quality is no doubt due to the system's naturally excellent separation. The **AT-F7** and **AT-F2** features a reverse V-shaped formation for the two left and right coils to reduce the vibration mass as seen from the stylus tip.

• Durable construction dedicated to achieving increased rigidity

Using a precision-crafted sturdy aluminium alloy as the base, the body's structure is made of hard resin which minimizes parasitic resonance. This achieves greater rigidity and improves signal-to-noise ratio.

Dual moving coil cartridge AT-F7

• The **AT-F7** is equipped with an elliptical stylus (curvature radius: 0.2 x 0.7 mil).

• High-rigidity VC mold combined with potassium titanate minimizes unnecessary vibration

The VC structure that holds the coils in place is made of a hard resin, which is combined with potassium titanate for increased strength and rigidity. The result is less weight and an unprecedented reduction of unnecessary vibration.

Dual moving coil cartridge AT-F2

• The **AT-F2** is equipped with an elliptical stylus (curvature radius: 0.3 x 0.7 mil).

Elliptical



Nude Square Shank



AT-F2

AT-F2

EAN 4961310127213

Moving coil true mono cartridges for mono vinyl records (PC 104-MC 520)

AT33MONO

EAN 4961310098964

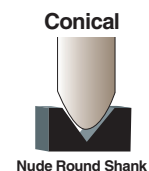
High-end moving coil mono cartridge for mono vinyl records

The **AT33Mono** is made specifically for use on mono LP.

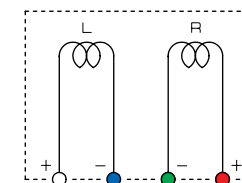
The **AT33Mono** produces sound to a very high quality because it does not easily pick up unnecessary strain components from distorted or scratched records, producing audio that you couldn't possibly get from a stereo cartridge.

The **AT33Mono** also has appropriate compliance in the vertical direction, so will not cause damage to stereo records.

- Mono cartridge compatible with stereo playback systems.
- 0.65mil conical nude round shank stylus hard duralumin cantilever.
- Strong body stabilized by a rigid body set-up.
- "Hanenite" anti-vibration high-damping rubber eliminates unnecessary vibrations.
- High-quality sound / brass fastening screw.
- Note: this model is not compatible with SP records due to the size of the diamond (0.6mil) designed for micro-groove 33.3 rpm records.



AT33MONO



• AT33MONO internal wiring

This schematic shows the internal wiring of **AT33MONO** featuring two horizontal voice coils each voice coils termination is available independently per the above diagram.

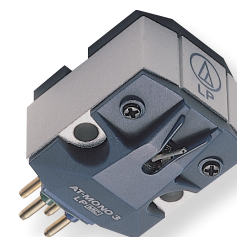
AT-MONO3/LP

EAN 4961310008321

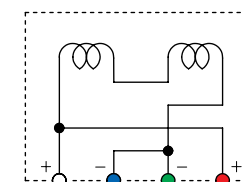
High output moving coil mono cartridge for mono vinyl LP (Long Play) records

Made specifically for mono recordings on vinyl records, the cartridge only generates signal with horizontal movement. However to produce a minimal wear on the groove, the **AT-MONO3/LP** also has an adapted vertical compliance.

- Carefully selected components and state of the art technology produce a high resolution cartridge.
- Straight pipe aluminium cantilever and low mass stylus guarantees a high tracking ability.
- The average usage time is 500 hours extending the life span of precious mono recordings.
- High purity PCOCC allows a more transparent signal transmission both high efficiency and high fidelity.
- To support the internal mechanism, the body is made of solid die-cast aluminium alloy, furthermore stiffness is achieved with the addition of rigid synthetic resin to hold the body.
- Note: this model is not compatible with 78rpm SP records due to the size of the diamond (0.6mil) designed for micro-groove 33.3 rpm records.



AT-MONO3/LP



• AT-MONO3/LP and AT-MONO3/SP internal wiring

This schematic shows the internal wiring of **AT-MONO3/LP** and **AT-MONO3/SP** featuring two horizontal voice coils wired in series, resulting electrically as a single mono voice coil. The mono signal is available from white-blue terminals, the same signal is also available from red-green terminals in order to feed both inputs of a stereo phono preamp.

Moving coil true mono cartridge for 78rpm (1925-1952 Shellac SP records) (PC 104-MC 520)

AT-MONO3/SP

EAN 4961310008338

High output moving coil cartridge for 78rpm mono Shellac SP (Standard Play) records

The **AT-MONO3/SP** cartridges is designed to faithfully transcribe the performances recorded on 78rpm Shellac records.

Made specifically for mono recordings, the cartridge only generates signal with horizontal movement. However to produce a minimal wear on the groove, the **AT-MONO3/SP** also has an adapted vertical compliance.

- Straight pipe aluminium cantilever and low mass stylus guarantees a high tracking ability.
- The average usage time is 500 hours extending the life span of precious mono recordings.
- High purity PCOCC allows a more transparent signal transmission offering a high efficiency and a high fidelity.
- To support the internal mechanism, the body is made of solid die-cast aluminium alloy, furthermore stiffness is achieved with the addition of rigid synthetic resin to hold the body.



AT-MONO3/SP

Audiophile moving coil cartridges specifications

Model Number	AT-ART9	AT-ART7	AT-OC9/III	AT-OC9ML/II	AT33sa	AT33EV
						
Type	Magnetic Core Moving Coil	Non-magnetic Core Moving Coil	Dual Moving Coil	Dual Moving Coil	Dual Moving Coil	Dual Moving Coil
Body Material	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium/Synthetic Resin	Aluminium/Synthetic Resin
Frequency Response	15 to 50,000 Hz	15 to 50,000 Hz	15 to 50,000 Hz	15 to 50,000 Hz	15 to 50,000 Hz	15 to 50,000 Hz
Channel Separation	30 dB (1 kHz)	30 dB (1 kHz)	30 dB (1 kHz)	31 dB (1 kHz)	30 dB (1 kHz)	30 dB (1 kHz)
Output Channel Balance	0.5 dB (1 kHz)	0.5 dB (1 kHz)	0.5 dB (1 kHz)	1.0 dB (1 kHz)	0.5 dB (1 kHz)	0.5 dB (1 kHz)
Output	0.5 mV (at 1 kHz, 5 cm/sec)	0.12 mV (at 1 kHz, 5 cm/sec)	0.4 mV (at 1 kHz, 5 cm/sec)	0.4 mV (at 1 kHz, 5 cm/sec)	0.4 mV (at 1 kHz, 5 cm/sec)	0.3 mV (at 1 kHz, 5 cm/sec)
Vertical Tracking Angle	23 degrees	23 degrees	23 degrees (see note n°1)	23 degrees	23 degrees	23 degrees
Vertical Tracking Force Range	1.6 to 2 g (standard 1.8 g)	1.6 to 2 g (standard 1.8 g)	1.8 to 2.2 g (standard 2.0 g)	1.25 to 1.75 g (standard 1.5 g)	1.8 to 2.2 g (standard 2.0 g)	1.8 to 2.2 g (standard 2.0 g)
Stylus Shape	Special Line Contact Stylus	Special Line Contact Stylus	Line Contact Stylus	MicroLine™	Shibata	Elliptical Stylus
Stylus Curvature Radius	40 x 7 µm	40 x 7 µm	40 x 7 µm	Micro linear	Shibata	0.3 x 0.7 mil
Stylus Construction	Nude square shank	Nude square shank	Nude square shank	Nude square shank	Nude square shank	Nude square shank
Cantilever	0.26 mm Ø solid boron	0.26 mm Ø solid boron	0.26 mm Ø solid boron	Gold-plated solid boron	Nude tapered boron	Duralumin
Static Compliance	35 x 10 ⁻⁶ cm / dyne	35 x 10 ⁻⁶ cm / dyne	35 x 10 ⁻⁶ cm / dyne	35 x 10 ⁻⁶ cm / dyne	40 x 10 ⁻⁶ cm / dyne	40 x 10 ⁻⁶ cm / dyne
Dynamic Compliance	18 x 10 ⁻⁶ cm / dyne (100 Hz)	10 x 10 ⁻⁶ cm / dyne (100 Hz)	18 x 10 ⁻⁶ cm / dyne (100 Hz)	9 x 10 ⁻⁶ cm / dyne (100 Hz)	10 x 10 ⁻⁶ cm / dyne (100 Hz)	10 x 10 ⁻⁶ cm / dyne (100 Hz)
Wire Used for Coil	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)
Terminal Pins	Brass	Brass	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)	Brass
Recommended Load Impedance	Min 100 Ω (see note n°4)	Min 100 Ω (see note n°4)	Min 100 Ω (see note n°4)	Min 100 Ω (see note n°4)	Min 100 Ω (see note n°4)	Min 100 Ω (see note n°4)
Coil Impedance	12 Ω (1 kHz)	12 Ω (1 kHz)	12 Ω (1 kHz)	12 Ω (1 kHz)	10 Ω (1 kHz)	10 Ω (1 kHz)
DC Resistance	12 Ω	12 Ω	12 Ω	12 Ω	10 Ω	10 Ω
Coil Inductance	25 µH (1 kHz)	8 µH (1 kHz)	25 µH (1 kHz)	25 µH (1 kHz)	22 µH (1 kHz)	22 µH (1 kHz)
Cartridge Weight	8.5 g	8.5 g	8.0 g	8.0 g	6.9 g	6.9 g
Dimensions	17.3 (H) x 17.0 (W) x 25.6 (L) mm	17.3 (H) x 17.0 (W) x 25.6 (L) mm	17.3 (H) x 16.8 (W) x 25.7 (L) mm	17.3 (H) x 16.8 (W) x 25.7 (L) mm	16 (H) x 16.6 (W) x 26.5 (L) mm	16.0 (H) x 16.6 (W) x 26.5 (L) mm
Mounting	1/2" centers	1/2" centers	1/2" centers	1/2" centers	1/2" centers	1/2" centers
Replacement Stylus	(see note n°2)	(see note n°2)	(see note n°2)	(see note n°2)	(see note n°2)	(see note n°2)
Accessories Included	1 non-magnetic screw driver; 1 brush; 2 washers; 2 x 12 mm mounting screws; 2 Nuts; 2 x 18 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6106)	1 non-magnetic screw driver; 1 brush; 2 washers; 2 x 12 mm mounting screws; 2 Nuts; 2 x 18 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6106)	1 non-magnetic screw driver; 1 brush; 2 washers; 2 x 11 mm mounting screws; 2 Nuts; 2 x 18 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6101)	1 non-magnetic screw driver; 1 brush; 2 washers; 2 Nuts; 2 x 13.5 mm mounting screws; 2 x 18 mm mounting screws; 1 plastic protector;	1 non-magnetic screw driver; 1 brush; 2 washers; 2 Nuts; 2 x 13 mm mounting screws; 2 x 19 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6101)	1 non-magnetic screw driver; 1 brush; 2 washers; 2 Nuts; 2 x 13 mm mounting screws; 2 x 19 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6101)

⁽¹⁾ Vertical tracking angle of 20 degrees is IEC/DIN standard.

⁽²⁾ When the stylus is to be replaced, replace the entire cartridge. Take the used cartridge to your Audio-Technica Authorized Service Center.

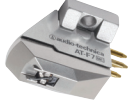
The new cartridge, or any other model which is desired among the line-up of MC cartridges sold by Audio-Technica, are available at the stylus replacement price (contact an Audio-Technica Authorized Service Center).

⁽³⁾ PCOCC = Pure Cooper by Ohno continuous casting process.

⁽⁴⁾ When head amplifier connected.

⁽⁵⁾ The abbreviation mil is equal a thousandth of an inch - mil = 0,001 inch = 0,0254 mm = 25,4 µm

Audiophile mc cartridges specifications

Model Number	AT33PTG/II	AT-F7	AT-F2
			
Type	Dual Moving Coil	Dual Moving Coil	Dual Moving Coil
Body Material	Aluminium/Synthetic Resin	Aluminium/Synthetic Resin	Aluminium/Synthetic Resin
Frequency Response	15 to 50,000 Hz	15 to 50,000 Hz	15 to 30,000 Hz
Channel Separation	30 dB (1 kHz)	27 dB (1 kHz)	25 dB (1 kHz)
Output Channel Balance	0.5 dB (1 kHz)	1.5 dB (1 kHz)	1.5 dB (1 kHz)
Output	0.3 mV (at 1 kHz, 5 cm/sec)	0.35 mV (at 1 kHz, 5 cm/sec)	0.32 mV (at 1 kHz, 5 cm/sec)
Vertical Tracking Angle	23 degrees	23 degrees	23 degrees
Vertical Tracking Force Range	1.8 to 2.2 g (standard 2.0 g)	1.8 to 2.2 g (standard 2.0 g)	1.8 to 2.2 g (standard 2.0 g)
Stylus Shape	MicroLine™	Elliptical Stylus	Elliptical Stylus
Stylus Curvature Radius	Micro linear	0.2 x 0.7 mil	0.3 x 0.7 mil
Stylus Construction	Nude square shank	Nude square shank	Nude square shank
Cantilever	Gold-plated solid boron	Aluminium	Aluminium
Static Compliance	40 x 10 ⁻⁶ cm / dyne	35 x 10 ⁻⁶ cm / dyne	35 x 10 ⁻⁶ cm / dyne
Dynamic Compliance	10 x 10 ⁻⁶ cm / dyne (100 Hz)	9 x 10 ⁻⁶ cm / dyne (100 Hz)	9 x 10 ⁻⁶ cm / dyne (100 Hz)
Wire Used for Coil	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)
Terminal Pins	Brass	Brass	Brass
Recommended Load Impedance	Min 100 Ω (see note n°4)	Min 100 Ω (see note n°4)	Min 100 Ω (see note n°4)
Coil Impedance	10 Ω (1 kHz)	12 Ω (1 kHz)	12 Ω (1 kHz)
DC Resistance	10 Ω	12 Ω	12 Ω
Coil Inductance	22 μH (1 kHz)	25 μH (1 kHz)	25 μH (1 kHz)
Cartridge Weight	6.9 g	5 g	5 g
Dimensions	16.0 (H) x 16.6 (W) x 26.5 (L) mm	17.3 (H) x 16.8 (W) x 25.4 (L) mm	17.3 (H) x 16.8 (W) x 25.4 (L) mm
Mounting	1/2" centers	1/2" centers	1/2" centers
Replacement Stylus	(see note n°2)	(see note n°2)	(see note n°2)
Accessories Included	1 non magnetic screw driver; 1 brush; 2 washers; 2 Nuts; 2 x 13 mm mounting screws; 2 x 19 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6101)	1 non magnetic screw driver; 1 brush; 2 washers; 2 Nuts; 2 x 5 mm mounting screws; 2 x 9 mm mounting screws; 1 plastic protector; 1 set of PCOCC Lead Wires (AT6101)	2 washers; 2 Nuts; 2 x 5 mm mounting screws; 2 x 9 mm mounting screws; 1 plastic protector

⁽¹⁾ Vertical tracking angle of 20 degrees is IEC/DIN standard.

⁽²⁾ When the stylus is to be replaced, replace the entire cartridge. Take the used cartridge to your Audio-Technica Authorized Service Center. The new cartridge, or any other model which is desired among the line-up of MC cartridges sold by Audio-Technica, are available at the stylus replacement price (contact an Audio-Technica Authorized Service Center).

⁽³⁾ PCOCC = Pure Cooper by Ohno continuous casting process.

⁽⁴⁾ When head amplifier connected.

⁽⁵⁾ The abbreviation mil is equal a thousandth of an inch - mil = 0,001 inch = 0,0254 mm = 25,4 μm

Cartridges specifications for vintage records: 78 rpm Shellac and mono-vinyl

for 78 rpm Shellac Records		for Mono Vinyl (see note n°1)	
Model Number	AT-MONO3/SP	AT-MONO3/LP	AT33 MONO
			
Type	Horizontal Mono Moving Coil (see note n°5)	Horizontal Mono Moving Coil (see note n°6)	Horizontal Mono Moving Coil
Body Material	Aluminium/Synthetic Resin	Aluminium/Synthetic Resin	Aluminium/Synthetic Resin
Frequency Response	22 to 20,000 Hz	20 to 20,000 Hz	20 to 20,000 Hz
Output Voltage	1.2 mV (at 1 kHz, 12 cm/sec)	1.2 mV (at 1 kHz, 5.0 cm/sec)	0.35 mV (at 1 kHz, 5.0 cm/sec)
Vertical Tracking Angle	23 degrees	23 degrees	23 degrees (see note n°1)
Vertical Tracking Force Range	3 to 7 g (standard 5.0 g)	1.5 to 2.5 g (standard 2.0 g)	2.3 to 2.7 g (standard 2.5 g)
Stylus Shape	Conical	Conical	Conical
Stylus Construction & Size	2.5 mil (see note n°5), 63,5 μm	0.6 mil (see note n°5), 15,2 μm	0.65 mil (see note n°5), 16,5 μm
Cantilever	Aluminium Pipe	Aluminium Pipe	Dural Pipe
Static Compliance	10 x 10 ⁻⁶ cm / dyne	20 x 10 ⁻⁶ cm / dyne	20 x 10 ⁻⁶ cm / dyne
Dynamic Compliance	3.5 x 10 ⁻⁶ cm / dyne (100 Hz)	7 x 10 ⁻⁶ cm / dyne (100 Hz)	6 x 10 ⁻⁶ cm / dyne (100 Hz)
Wire Used for Coil	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)
Recommended Load Impedance	400 Ω to 47,000 Ω (see note n°7)	400 Ω to 47,000 Ω (see note n°7)	Min 100 Ω (see note n°4)
Coil Impedance	40 Ω (1 kHz)	40 Ω (1 kHz)	10 Ω (1 kHz)
DC Resistance	40 Ω	40 Ω	10 Ω
Coil Inductance	190 μH (1 kHz)	190 μH (1 kHz)	28 μH (1 kHz)
Cartridge Weight	6.8 g	6.8 g	6.9 g
Dimensions	16.0 (H) x 16.6 (W) x 26.5 (L) mm	16.0 (H) x 16.6 (W) x 26.5 (L) mm	16.0 (H) x 16.6 (W) x 26.5 (L) mm
Mounting	1/2" centers	1/2" centers	1/2" centers
Replacement Stylus	(see note n°2)	(see note n°2)	(see note n°2)
Accessories Included	Non-magnetic screw driver; 1 brush; 2 washers; 2 x 19 mm mounting screws; 2 x 13 mm mounting screws; 2 x nuts; 1 plastic protector; 1 set of PCOCC lead wires AT6101	Non-magnetic screw driver; 1 brush; 2 washers; 2 x 19 mm mounting screws; 2 x 13 mm mounting screws; 2 x nuts; 1 plastic protector; 1 set of PCOCC lead wires AT6101	Non-magnetic screw driver; 1 brush; 2 washers; 2 x 19 mm mounting screws; 2 x 13 mm mounting screws; 1 plastic protector; 2 x nuts; 1 set of PCOCC lead wires AT6101

⁽¹⁾ Vertical tracking angle of 20 degree is IEC/DIN standard.

⁽²⁾ When the stylus is to be replaced, replace the entire cartridge. Take the used cartridge to your Audio-Technica Authorized Service Center. The new cartridge, or any other model which is desired among the line-up of MC cartridges sold by Audio-Technica is available at the stylus replacement price (contact Audio-Technica Authorized Service Center).

⁽³⁾ PCOCC = Pure Cooper by Ohno continuous casting process.

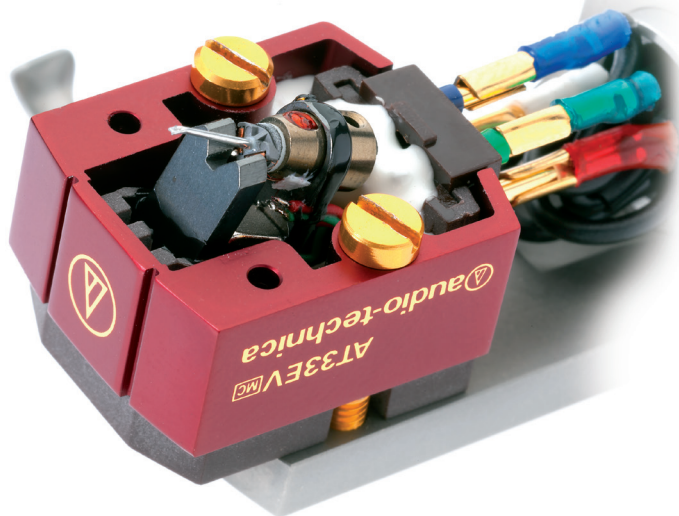
⁽⁴⁾ When head amplifier connected.

⁽⁵⁾ The abbreviation mil is equal a thousandth of an inch - mil = 0,001 inch = 0,0254 mm = 25,4 μm

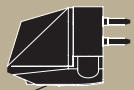
⁽⁶⁾ Due to high output voltage this moving coil cartridge can be used directly in MM phono inputs without the use of a step-up transformer.

⁽⁷⁾ When connected to the MC input of a transformer-less phono pre-amp, choose a lower gain position due to the high output voltage (1.2 mV).

Note: Moving Coil Cartridges Styli are not field replaceable



Moving Coil Cartridge



Authorized Service Center



audio-technica

Terms and conditions

The customer must return the old Audio-Technica moving coil cartridge to an Authorized Moving Coil Cartridge Service Centre along with proof of purchase.

The MC cartridge returned under the program must be outside of its warranty period, and be in working order (with the exception of a worn stylus) with no mechanical damage.

This program is available exclusively for customers in Europe.

(For customers with damaged or broken cartridges, please contact your local Authorized Moving Coil Cartridge Service Centre for assistance)

Moving coil cartridges replacement styli European program

Due to the technical nature and highly skilled construction involved in moving coil cartridges, it is not possible to replace the stylus. Audio-Technica does not recommend having a moving coil cartridge re-tipped or repaired by any independent, unauthorized repair centre since the original performance and optimal specifications can only be obtained when the complete cartridge is assembled and thoroughly tested by our skilled engineers at Audio-Technica's specialist production facility in Japan. Therefore Audio-Technica offers two comprehensive trade-in programs for its customers with moving coil cartridges with worn out styli. Under the first program, customers are able to trade-in their old cartridge for a brand new MC cartridge of the same model (or equivalent or lower priced), and under the second program customers are able to take the opportunity to upgrade to a higher grade model.

Moving coil cartridge trade-in program prices

This program allows Audio-Technica customers to trade-in their old cartridge for a brand new MC cartridge of the same model (or equivalent or lower priced) at a discounted price of **40%** off the Audio-Technica European recommended retail price (at the time of trade-in) when they return their old model to us.

AT-ART9/RP	ART9 Cartridge replacement program
AT-ART7/RP	ART7 Cartridge replacement program
AT-OC9/III/RP	AT-OC9/III Cartridge replacement program
AT-OC9ML/II/RP	AT-OC9ML/II Cartridge replacement program
AT33EV/RP	AT33EV Cartridge replacement program
AT33PTG/II/RP	AT33PTG/II/ Cartridge replacement program
AT33sa/RP	AT33sa Cartridge replacement program
AT-F7/RP	AT-F7 Cartridge replacement program
AT-F2/RP	AT-F2 Cartridge replacement program
AT-MONO3/LP/RP	AT-MONO3/LP Cartridge replacement program
AT33MONO/RP	AT33MONO Cartridge replacement program
AT-MONO3/SP/RP	AT-MONO3/SP Cartridge replacement program

Moving coil cartridge trade-in program prices with model upgrade

This program allows Audio-Technica customers to trade-in their old cartridge for an alternative or higher priced brand new MC cartridge at a discounted price of **30%** off the Audio-Technica European recommended retail price (at the time of trade-in) when they return their old model to us.

AT-ART9/RPU	ART9 Cartridge replacement program with upgrade
AT-ART7/RPU	ART7 Cartridge replacement program with upgrade
AT-OC9/III/RPU	AT-OC9/III Cartridge replacement program with upgrade
AT-OC9ML/II/RPU	AT-OC9ML/II Cartridge replacement program with upgrade
AT33EV/RPU	AT33EV Cartridge replacement program with upgrade
AT33PTG/II/RPU	AT33PTG/II/ Cartridge replacement program with upgrade
AT33sa/RPU	AT33sa Cartridge replacement program with upgrade
AT-F7/RPU	AT-F7 Cartridge replacement program with upgrade
AT-F2/RPU	AT-F2 Cartridge replacement program with upgrade
AT-MONO3/LP/RPU	AT-MONO3/LP Cartridge replacement program with upgrade
AT33MONO/RPU	AT33MONO Cartridge replacement program with upgrade
AT-MONO3/SP/RPU	AT-MONO3/SP Cartridge replacement program with upgrade

Limited edition moving coil cartridge trade-in program

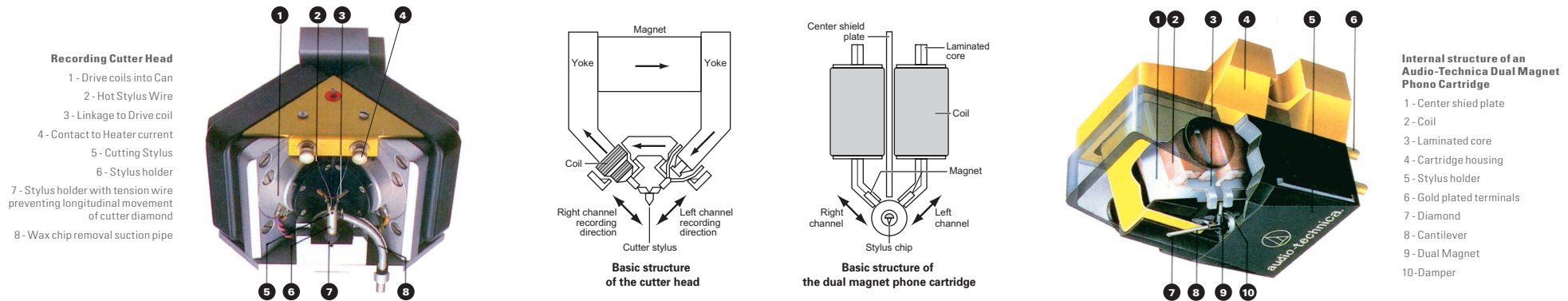
AT50ANV/RP	AT50ANV anniversary MC cartridge was a limited edition and case stylus replacement is necessary, the owner of AT50ANV will be able to trade in for model AT-ART7 , offering very similar performance. (See AT-ART7 trade-in program prices above.)
AT-OC9/III LTD	AT-OC9/III LTD was a limited edition and in case stylus replacement is necessary, the owner of AT-OC9/III LTD will be able to trade in for the model AT-OC9/III , offering very close similar performance. (See AT-OC9/III trade-in program prices above.)

How does a VM type moving magnet cartridge work?

First, a word about how record grooves are created. Left and right-channel audio signals drive two coils, mounted at 90 degrees to each other, in a cutter head. The combined motion of these two signals causes the cutter stylus to carve out an undulating groove in a master record. Modulations in the groove walls, then, are “analogue” mechanical equivalents of the original audio signals. It’s the cartridge’s job to “read” these modulations and to reconstruct the original stereo signals.

Most cartridges on the market today reconstruct these signals by utilizing a “moving magnet” system. The stylus (or needle) of the cartridge is attached to a tiny arm (called a cantilever) that can pivot as the stylus is moved by the record groove. A magnet at the other end of the cantilever moves between metal poles that extend from coils of wire, causing an electrical flow that is eventually amplified and heard as sound.

It is no coincidence that our approach to moving magnet cartridges closely duplicates the structure of the record cutting head. Instead of using a single, large magnet, Audio-Technica’s patented Vector-Aligned™ Dual Magnet™ design positions two tiny magnets 90 degree apart – directly in line with the two groove walls – with a separate, independent coil structure for each magnet. This ideal geometry and low magnet mass allow exact translation of record groove motion into matching electrical signals, ensuring excellent channel separation, extended frequency response and superb tracking.

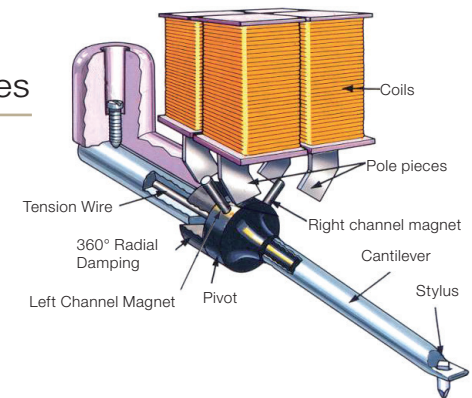


Para-toroidal coil construction of AT150MLX, AT440MLb, AT120Eb, AT5V and AT100E VM cartridges

With the VM type dual magnet system & high-performance para-toroidal generator coil system, Audio-Technica’s VM stereo cartridges feature a unique structure. The structure greatly improves electro-magnetic performances compared with non para-toroidal construction such as in 90 Series cartridges.

Additionally, the models **AT150MLX**, **AT440MLa**, **AT120E**, **AT5V** and **AT100E** adopts a lossless para-toroidal generator coil system to their cartridge bodies that results in peak generating efficiency.

Stacking two cores makes further improvements to high frequency characteristics by separating the right-and-left channels from the center shield plate, resulting in reduced electrical cross talk.



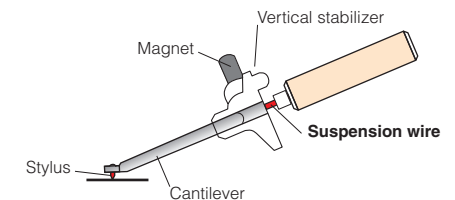
Importance of tension wire construction and material (see illustration above)

Suspension wire (tension wire) has an important role as fulcrum point of the cantilever /stylus/magnets assembly.

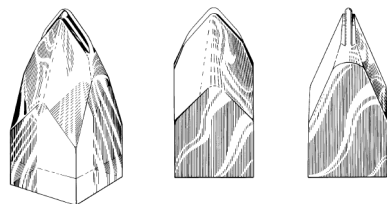
high quality Audio-Technica MC cartridges use stainless suspension wire, providing a mechanical stabilization optimizing auditory lateralization to provide excellent expression of the high frequency range.

Audio-Technica moving magnet cartridge models **AT150MLX**, **AT5V** are designed with a stainless suspension wire featuring unique design and using selected materials.

Cartridge models **AT440MLa**, **AT120E**, and **AT100E** and other **90 Series** models are designed with a molded integrated suspension system. As an example, cartridges such as **AT5V**, equipped with a conical stylus uses a sophisticated tension wire providing better sonic accuracy and much more controlled response than models such as **90 Series** dual moving magnet cartridges.



para-toroidal coil VM cartridges



MicroLine™ nude shank diamond of AT150MLX and AT440MLa

MicroLine™ VM type dual moving magnet audiophile cartridge (PC 105-MC 520)

AT150MLX

EAN 4961310030902

Audiophile moving magnet cartridge with MicroLine™ diamond

- Wide Range Vector-Aligned Vibration System
- Para-toroidal generator coil circuit
- System featuring PCOCC Wire
- MicroLine® shaped diamond tip
- Gold-plated boron cantilever
- Mu-metal shielding plate

Gold-plated boron cantilever. Its tiny, gold-plated boron cantilever provides an extremely rigid yet lightweight platform to which the stylus is mounted. Interestingly, the gold plating acts to damp what little resonance the boron may produce.

MicroLine™ Stylus. The stylus used is of the latest and most advanced design: the MicroLine™ stylus (Figure 1). More closely resembling the cutter stylus than any previous design, this shape produces better high frequency response with less wear or distortion than with earlier configurations.

PCOCC Wire. A technologically advanced pure copper material is used in Audio-Technica's exclusive "Para-toroidal Signal Generator" (Figure 2). Together with the laminated core structure, which minimizes loss in the high frequency region, this integrated para-toroidal generator system operates at an efficiency significantly greater than conventional cartridges. The use of PCOCC wire (Pure Copper by Ohno Continuous Casting) perfects the performance of the advanced para-toroidal coil design. A special high-temperature extrusion die produces copper with virtually no transverse crystal barriers to impede signal transmission or colour sound. Thus, the coils of the AT150MLX transmit distortion-free sound in which even the most subtle details are reproduced with clarity and purity.

A mu-metal shielding plate between the left and right channels in the generator system assure that the high level of channel separation achieved is preserved at the cartridge output. To further increase the accuracy of the AT150MLX's moving system, Audio-Technica engineers have ensured against unwanted parasitic vibration with an anti-resonance ceramic mounting base.

As a final attention to detail, even the output terminals are constructed of PCOCC copper. This meticulous care and attention given to every minute detail in both the vibration and generator systems has resulted in a significant improvement in the performance and sound quality. This superb cartridge offers audiophiles and other serious listeners added musical enjoyment.

MicroLine™ VM type dual moving magnet premium cartridge (PC 105-MC 520)

AT440MLb

EAN 4961310129651

High-end moving magnet cartridge with MicroLine™ diamond

This **AT440MLa** cartridge is equipped with Audio-Technica's patented Dual Magnet cartridge design and delivers **"practically identical to the cutter head"** performance.

Additional features include a para-toroidal generator coil circuit, a Micro linear stylus, plus other advanced designs for top performance.

MicroLine® shaped diamond tip for better high frequency response with less wear and distortion than elliptical or conventional linear contact styli.

- Dual magnet cartridge design
- Para-toroidal generator coil circuit
- Micro linear stylus
- PCOCC wire
- Gold plated connectors



AT440MLb

Elliptical nude shank dual moving magnet premium cartridge (PC 105-MC 520)

AT120Eb

EAN 4961310129675

Elliptical nude shank VM cartridge para-toroïdal

- 0.3 x 0.7 mil **nude** shank elliptical **precision polished** diamond
- **Para-toroidal** coils, long recognized for their high efficiency, are utilized here for the first time in cartridge manufacturing. The result is a series characterized by uniform response and distortion-free performance.
- **Gold-plated** connectors assure maximum energy transfer.
- Superior imaging and channel separation are achieved through the **A-T Vector Aligned Dual Magnet design**.



AT120Eb

para-toroidal coil VM cartridges

Conical and elliptical bonded round shank styli **para-toroidal coil** VM cartridges (PC 105-MC 520)

Para-toroidal coils, long recognized for their high efficiency, are utilized here for the first time in cartridge manufacturing. The result is a series characterized by uniform response and distortion-free performance.

Gold-plated connectors assure maximum energy transfer.

Superior imaging and channel separation are achieved through the A-T Vector Aligned Dual Magnet design.

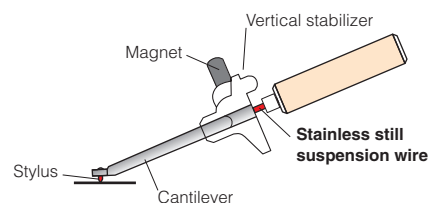


AT5V

EAN 4961310120252

VM cartridge with para-toroidal coil and conical stylus

- VM type dual magnet system
- **High-performance para-toroidal** generator coil system
- Gold plated connectors
- PCOCC coil
- **Stainless steel suspension wire** improving sound quality and transient response
- Conical polished diamond stylus for **less critical tilt angle adjustment** allowing more flexible use on various tonearms



AT5V cartridge is equipped with **stainless steel suspension wire** system of the AT150MLX cartridge and a compliance adjustment screw.



AT100E

EAN 4961310115968

Elliptical stylus VM cartridge with para-toroidal coil

- VM type dual magnet system
- **High-performance para-toroidal generator coil system**
- Gold plated connectors
- PCOCC coil
- Molded integrated suspension wire
- Elliptical stylus

Conical and elliptical styli VM **standard coil** AT90 series cartridges (PC 105-MC 520)

The **AT90 Series** represents years of research and development aimed at producing high-performance cartridges at a reasonable price. Features include durable dual magnet design and round diamond stylus, capable of standing up to rigorous commercial use. Excellent channel separation and low distortion add to outstanding tonal quality. **AT90 Series** cartridges can be mounted on virtually any tonearm.

VM cartridges

AT95E/BL

EAN 4961310016388

AT95E elliptical stylus MM stereo cartridge

AT95E cartridge delivered in original Audio-Technica blister pack

- Dual magnet design
- 0.3 x 0.7 mil elliptical stylus
- Alloy tube cantilever



AT95E

Elliptical



Bonded Round Shank

AT91/BL

EAN 4961310009885

AT91 conical stylus MM stereo cartridge

AT91 cartridge delivered in blister pack

- Conical stylus
- Dual magnet design
- 2.0g tracking force
- Sold in North America as model CN5625AL



AT91

Conical



Bonded Round Shank

About AT3600L conical stylus budget model cartridge

AT3600L

AT3600L cartridge

Exclusively available to turntables manufacturers.

The **AT3600L** cartridge is not available from your Audio-Technica Dealer as a separate item.

The **AT3600L** cartridge is supplied as a budget model moving magnet cartridge on several turntables available on the market.

For similar applications, our entry model **AT91** provides improved performance.

AT91 standard tracking force being **2g** instead of **3.5g** for **AT3600L**, using **AT91** will improve the life of your vinyl records.

The **AT3600L** can be upgraded in order to minimize record wear using replacement stylus **ATN91**.

The upgrade is only possible if your turntable tonearm features tracking force adjustment.



3.5g
TRACKING FORCE



AT3600L

VM dual MM cartridges



P-mount and U-mount moving magnet plug-in cartridges (PC 105-MC 520)

This selection of three cartridges allows owners of *Technics*TM, *Hitachi*TM, *Pioneer*^{TM(3)} and similar linear tracking turntables with T4P plug-in connectors to enjoy the high-fidelity sound that only Audio-Technica can offer.

Each is designed specifically for the linear format, while all feature Audio-Technica's unique dual moving magnet construction. The dual magnet system is combined with the para-toroidal coil construction to assure an excellent sonic clarity and wide channel separation. Special Alnico magnets are employed for a natural and uncoloured sonic performance.

The models **AT300P** and **AT311EP** include a universal mounting kit for use with other tonearms.

Conical stylus **P-mount only** moving magnet cartridge

AT3482P

EAN 5055145748046

AT3482P P-mount MM cartridge, conical stylus

- 0.6 mil conical stylus
- Carbon fiber cantilever
- Installation screw and nut supplied
- Bonded round shank diamond

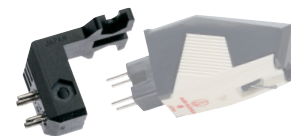
Conical stylus **P-mount** moving magnet cartridges with universal 1/2" adaptor

AT300P

EAN 5055145748077

AT300P U-mount MM cartridge, conical stylus

- 0.6 mil conical stylus
- Alloy tube cantilever
- Universal adaptor, installation screw and nut supplied
- Bonded round shank diamond



AT300P includes P20020 adaptor P-mount to 1/2"

P-mount and U-mount moving magnet plug-in cartridges (PC 105-MC 520)

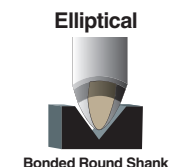
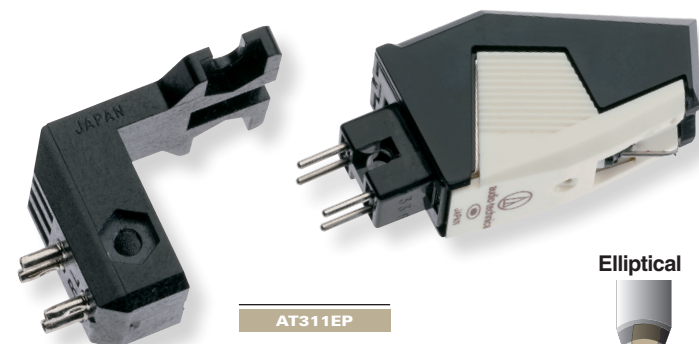
Elliptical stylus **P-mount** moving magnet cartridges with universal 1/2" adaptor

AT311EP

EAN 5055145748060

P-mount MM cartridge, elliptical stylus with universal adaptor

- 0.3 x 0.7 mil elliptical stylus
- Alloy tube cantilever
- Universal adaptor, installation screw and nut supplied
- Bonded round shank diamond

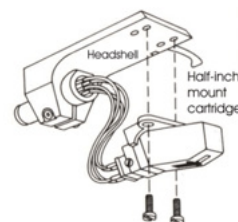


P-mounting and U-mounting

Audio-Technica cartridges are designed with one of three mounting options:

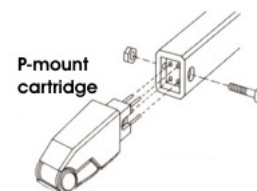
- the **P-mount** (plug-in)
- the **half-inch** mount (1/2")
- the **universal** mount

- **Half-inch mount cartridge** also has four terminals at the back, but they are larger pins that connect to four individual wires at the end of the tone arm. The cartridge is secured to the tone arm's headshell with two screws, spaced 1/2" apart.



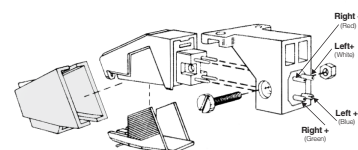
AT311EP or **AT300P** mounted on standard 1/2" headshell using P20020 U-mount adaptor.

- **P-mount cartridge** has four terminals at the back that simply plug in to the end of the tone arm. The cartridge is then secured to the tone arm with a single screw.



AT311EP, AT300P, AT3482P mounted on P-mount tonearm (screw and nut are supplied with all models).

- **Universal mount model** is a P-mount cartridge with an included half-inch adapter bracket. It is thus compatible with both P-mount and half-inch mount tone arms.



Universal Mount (P-mount cartridge with 1/2" adaptor **P20020**)

Half-inch mount moving magnet cartridges specifications

Model Number	AT150MLX	AT440MLb	AT120Eb	AT5V	AT100E	AT95E	AT91	AT3600L (see note n°5)
								
Type	VM Dual Magnet	VM Dual Magnet	VM Dual Magnet	VM Dual Magnet	VM Dual Magnet	VM Dual Magnet	VM Dual Magnet	VM Dual Magnet
Frequency Response	10 to 30,000 Hz	20 to 25,000 Hz	20 to 25,000 Hz	20 to 20,000 Hz	20 to 20,000 Hz	20 to 20,000 Hz	20 to 20,000 Hz	20 to 20,000 Hz
Channel Separation	30 dB (1 kHz)	28 dB (1 kHz)	28 dB (1 kHz)	24 dB (1 kHz)	27 dB (1 kHz)	18 dB (1 kHz)	18 dB (1 kHz)	20 dB (1 kHz)
Output Channel Balance	0.8 dB (1 kHz)	1.0 dB (1 kHz)	1.0 dB (1 kHz)	1.5 dB (1 kHz)	1.5 dB (1 kHz)	2.5 dB	2.5 dB	2 dB
Output Voltage	4.0 mV (at 1 kHz, 5 cm/sec)	4.0 mV (at 1 kHz, 5 cm/sec)	4.0 mV (at 1 kHz, 5 cm/sec)	5.0 mV (at 1 kHz, 5 cm/sec)	4.5 mV (at 1 kHz, 5 cm/sec)	4 mV (at 1 kHz, 5 cm/sec)	3.5 mV (at 1 kHz, 5 cm/sec)	3.5 mV (at 1 kHz, 5 cm/sec)
Vertical Tracking Angle	23 degrees	20 degrees	20 degrees	23 degrees	23 degrees	20 degrees	20 degrees	
Vertical Tracking Force Range	0.75 to 1.75 g (standard 1.25 g)	1.0 to 1.8 g (standard 1.4 g)	1.0 to 1.8 g (standard 1.4 g)	1.8 to 2.2 g (standard 2 g)	1.0 to 1.8 g (standard 1.4 g)	1.5 to 2.5 g (standard 2.0 g)	1.5 to 2.5 g (standard 2.0 g)	3.5 g
Stylus Shape	MicroLine™	MicroLine™	Elliptical	Conical	Elliptical	Elliptical	Conical	Conical
Stylus Size	Micro linear	Micro linear	0.3 x 0.7 mil (see note n°4)	0.6 mil (see note n°4)	0.3 x 0.7 mil (see note n°4)	0.3 x 0.7 mil (see note n°4)	0.6 mil	0.6 mil
Stylus Construction	Nude Square Shank	Nude Square Shank	Nude Round Shank	Jointed Round Shank	Jointed Round Shank	Jointed Round Shank	Jointed Round Shank	Jointed Round Shank
Cantilever	Gold-plated solid boron	Aluminium Tapered Pipe	Aluminium Pipe	Aluminium Pipe	Aluminium Pipe	Aluminium Pipe	Carbon Fiber Reinforced ABS	Carbon Fiber Reinforced ABS
Static Compliance	40 x 10 ⁻⁶ cm / dyne (100 Hz)	40 x 10 ⁻⁶ cm / dyne	25 x 10 ⁻⁶ cm / dyne	35 x 10 ⁻⁶ cm / dyne	35 x 10 ⁻⁶ cm / dyne	20 x 10 ⁻⁶ cm / dyne	20 x 10 ⁻⁶ cm / dyne	
Dynamic Compliance	10 x 10 ⁻⁶ cm / dyne (100 Hz)	10 x 10 ⁻⁶ cm / dyne (100 Hz)	10 x 10 ⁻⁶ cm / dyne (100 Hz)	8.0 x 10 ⁻⁶ cm / dyne (100 Hz)	8 x 10 ⁻⁶ cm / dyne (100 Hz)	6.5 x 10 ⁻⁶ cm / dyne (100 Hz)	6.5 x 10 ⁻⁶ cm / dyne (100 Hz)	
Wire Used for Coil	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)	PCOCC (see note n°3)	TPC	TPC	TPC
Recommended Load Impedance	47,000 Ω	47,000 Ω	47,000 Ω	47,000 Ω	47,000 Ω	47,000 Ω	47,000 Ω	47,000 Ω
Recommended Load Capacitance	100-200 pF	100-200 pF	100-200 pF	100-200 pF	100-200 pF	100-200 pF	100-200 pF	100-200 pF
Coil Inductance	360 mH (1 kHz)	490 mH (1 kHz)	490 mH (1 kHz)	360 mH (1 kHz)	360 mH (1 kHz)	400 mH (1 kHz)	400 mH (1 kHz)	400 mH (1 kHz)
Coil Impedance	3,200 Ω (1 kHz)	3,200 Ω (1 kHz)	3,200 Ω (1 kHz)		3,200 Ω (1 kHz)			
Coil DC Resistance		800 Ω	800 Ω		800 Ω			
Cartridge Weight	8.3 g	6.5 g	6.5 g	6.1 g	6.5 g	5.7 g	5.7 g	5.7 g
Dimensions	17.3 (H) x 17.0 (W) x 28.2 (L) mm	17.3 (H) x 16.0 (W) x 28.0 (L) mm	17.3 (H) x 16.0 (W) x 28.0 (L) mm	17.3 (H) x 15.2 (W) x 26.9 (L) mm	17.3 (H) x 16.0 (W) x 28.2 (L) mm			
Mounting	1/2" centers	1/2" centers	1/2" centers	1/2" centers	1/2" centers	1/2" centers	1/2" centers	1/2" centers
Replacement Stylus	ATN150MLX	ATN440MLb	ATN120 Eb	ATN5V	ATN100E	ATN95E	ATN91	ATN3600L or ATN91 (see note n°6)
Accessories Included	Non-magnetic screw driver; Anti-static stylus brush; Two 8 mm installation screws; Two 5 mm installation screws; Two hexagonal nuts; Two round nuts; Four washers; One set of PCOCC Lead Wires (AT6101)	Non-magnetic screw driver; Anti-static stylus brush; Two 8 mm installation screws; Two 5 mm installation screws; Two hexagonal nuts; Two round nuts; Four washers; One set of PCOCC Lead Wires (AT6101)	Non-magnetic screw driver; Anti-static stylus brush; Two 8 mm installation screws; Two 5 mm installation screws; Two hexagonal nuts; Two round nuts; Four washers;	Two 10 mm installation screws; Two 5 mm installation screws; Two hexagonal nuts; Two round nuts; Four washers;	Non-magnetic screw driver; Anti-static stylus brush; Two 8 mm installation screws; Two 5 mm installation screws; Two hexagonal nuts; Two round nuts; Four washers;	Two 8 mm installation screws; Two 5 mm installation screws; Two hexagonal nuts; Two round nuts; Four washers;	Two 8 mm installation screws; Two 5 mm installation screws; Two hexagonal nuts; Two round nuts; Four washers;	AT3600L cartridge comes already installed on turntable.

⁽¹⁾ Vertical tracking angle of 20 degree is IEC/DIN standard.

⁽²⁾ The extension B or BL indicates only the packaging of the product (Bulk or Blister).

⁽³⁾ PCOCC = Pure Cooper by Ohno continuous casting process.

⁽⁴⁾ The abbreviation mil is equal to a thousandth of an inch - mil = 0,001 inch = 0,0254 mm = 25,4 μm

⁽⁵⁾ The AT3600L budget cartridge is exclusively available as a factory fitted entry model for turntable manufacturers only.

⁽⁶⁾ ATN3600L replacement stylus is the original stylus of AT3600L cartridge.

ATN91 is an upgrade replacement stylus for AT3600L, this replacement is only possible if your turntable tonearm features tracking force adjustment.

P-mount & U-mount moving magnet cartridges specifications

Model Number	AT3482P	AT300P	AT311EP
			
Type	Dual Magnet	Dual Magnet	Dual Magnet
Frequency Response	20 to 20,000 Hz	20 to 22,000 Hz	15 to 27,000 Hz
Channel Separation	24 dB / 15 dB (1 kHz/10 kHz)	26 dB / 16 dB (1 kHz/10 kHz)	29 dB / 18 dB (1 kHz/10 kHz)
Output Channel Balance	1.5 dB (1 kHz)	1.5 dB (1 kHz)	1.25 dB (1 kHz)
Output Voltage	5.0 mV (at 1 kHz, 5 cm/sec)	5.0 mV (at 1 kHz, 5 cm/sec)	3.5 mV (at 1 kHz, 5 cm/sec)
Vertical Tracking Angle	20 degree (see note n°1)	20 degree (see note n°1)	20 degree (see note n°1)
Vertical Tracking Force Range	1.0 to 1.5 g (1.25g recommended)	1.0 to 1.5 g (1.25g recommended)	1.0 to 1.5 g (1.25g recommended)
Stylus Shape	Conical	Conical	Elliptical
Stylus Size	0.6 mil (see note n°4)	0.6 mil (see note n°4)	0.3 x 0.7 mil (see note n°4)
Stylus Construction	Bonded Round Shank	Bonded Round Shank	Bonded Round Shank
Cantilever	Carbon Fiber	Alloy Tube	Alloy Tube
Color: body / styli	Black / Black	Black / Ivory	Black / Ivory
Wire Used for Coil	TPC	TPC	TPC
Recommended Load Impedance	47,000 Ω	47,000 Ω	47,000 Ω
Recommended Load Capacitance	100-200 pF	100-200 pF	100-200 pF
Coil Inductance	400 mH (1 kHz)	400 mH (1 kHz)	400 mH (1 kHz)
Mounting	P-mount only	P-mount & 1/2" mount	P-mount & 1/2" mount
Replacement Stylus	ATN3472P (aluminium cantilever)	ATN3472P	ATN3472SE
Accessories Included	P-mount black installation screw and nut; plastic protector;	P-mount black installation screw and nut; plastic protector; Universal 1/2" mount adaptor	P-mount black installation screw and nut; plastic protector; Universal 1/2" mount adaptor

⁽¹⁾ Vertical tracking angle of 20 degree is IEC/DIN standard.

⁽⁴⁾ The abbreviation mil is equal to a thousandth of an inch - mil = 0,001 inch = 0,0254 mm = 25,4 μm

Replacement MM cartridges styli for cartridges currently available

	ATN150MLX	ATN440MLb	ATN120Eb	ATN5V	ATN100E	ATN95E	ATN91	ATN3600L	ATN3472P	ATN3472SE
Half inch mount MM cartridges										
AT150MLX	●									
AT440MLb		●								
AT120Eb			●							
AT5V				●						
AT100E					●					
AT95E (B or BL)⁽¹⁾						●				
AT91 (B or BL)⁽¹⁾							●	○ ⁽²⁾		
AT3600L							★ ⁽³⁾	●		
P and U mount MM cartridges										
AT311EP									○ ⁽⁴⁾	●
AT300P									●	★ ⁽⁵⁾
AT3482P									●	★ ⁽⁵⁾

● Replacement stylus of the cartridge, will deliver original cartridge specification.

★ Compatible stylus for a given cartridge, will upgrade original cartridge specification.

○ Compatible stylus for a given cartridge, will deliver specification of a different cartridge model.

⁽¹⁾ The extension B or BL indicates only the packaging of the product (Bulk or Blister).

⁽²⁾ ATN3600L stylus can be used as replacement stylus for AT91. The compliance will be modified due to the different design of the cantilever. Note that the Tracking force will have to be adjusted to 3.5 g. Performance will be similar with a slight difference in tonal response, but the 3.5 g Tracking force could result in faster record wear.

⁽³⁾ ATN91 stylus can be used as upgrade replacement stylus for entry model OEM cartridges AT3600L and AT3600. Different stylus compliance of ATN91 can deliver slightly better tonal response. ATN91 lower tracking force than ATN3600L (2g versus 3.5g) minimize record wear and improves vinyl record life. Do not upgrade AT3600L with ATN91 stylus if your tone-arm does not allow tracking force adjustment.

⁽⁴⁾ AT311EP comes with elliptical stylus ATN3472SE. Conical stylus ATN3472P can be used with AT311EP because of mechanical and electrical compatibility, nevertheless performance will become to a conical cartridge such as AT300P and you will no longer benefit of the elliptical stylus shape of your AT311EP.

⁽⁵⁾ AT300P and AT3482P are equipped with a conical stylus. They can be upgraded with elliptical stylus ATN372SE, it is mechanically and electronically compatible.



Original Audio-Technica styli packaging, including: white box, transparent lid with Audio-Technica logo, internal stylus protection shell for diamond and cantilever protection.

Currently we are aware that counterfeit cartridges and styli, with a similar form factor to the **AT3600L**, **AT91** and **AT95E** are being distributed illegally.

The original condition of genuine **AT3600L**, **AT91** and **AT95E** consist of the following: Audio-Technica circle monogram on the styli, original Audio-Technica packaging (see above).

We recommend to purchase from a reseller displaying the official Audio-Technica Authorised Reseller logo.



Replacement and upgrade styli available in Europe for discontinued cartridges

	ATN150MLX	ATN440MLb	ATN120Eb	ATP-IN2	ATN100E	ATN95E	ATN91	ATN3600L	ATN3472P	ATN3472SE
AT150ANV	○ ⁽¹⁾									
AT440MLa		★								
AT440ML		★								
AT140ML		★								
AT140LC		★ ⁽²⁾								
AT120E			★ ⁽³⁾							
AT120ET			★ ⁽³⁾							
AT120E/II			★ ⁽⁴⁾							
ATP-1				★						
ATP-2 and ATP-2XN				●						
ATP-3				★						
AT100E/G					★					
AT3600								●		
AT93						●				
AT91ECD									○ ⁽⁵⁾	★ ⁽⁶⁾
AT301EP									○ ⁽⁵⁾	★ ⁽⁶⁾
AT92ECD									○ ⁽⁵⁾	★ ⁽⁶⁾
AT3482H/U									●	
AT90CD									●	

- Replacement stylus of the cartridge, will deliver original cartridge specification.
- ★ Compatible stylus for a given cartridge, will upgrade original cartridge specification.
- Compatible stylus for a given cartridge, will deliver specification of a different cartridge model.

⁽¹⁾ AT150ANV was a Limited Edition. Therefore, after 2012/2013, original replacement stylus may not be longer available, ATN150MLX becomes replacement stylus. The performance of the system will become the same as AT150MLX.

⁽²⁾ AT140LC cartridge will be pleasingly upgraded using ATN440MLb due to the MicroLine™ structure of the AT440MLb stylus.

⁽³⁾ Using ATN120Eb stylus will upgrade former AT120ET to the same performance as the current AT120Eb.

⁽⁴⁾ AT120E/II was a low cost version of AT120E, using a bounded round shank diamond (basically a AT100E) produced during a short period of time in 2011. Replacing AT120E/II stylus with ATN120Eb original stylus featuring nude diamond will offer full performance of premium AT120Eb cartridge to your AT120E/II

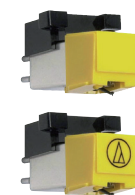
⁽⁵⁾ ATN3472P is a Conical stylus with Aluminium cantilever, using it with any P mount cartridges will turn your current model into a AT300P.

⁽⁶⁾ ATN3472SE is a 0.3x0.7 mil Elliptical stylus, using it with any of the listed P mount cartridges will turn you current model into a AT311EP.



Replacement Styli

Audio-Technica grain-oriented diamond styli are carefully selected and polished for minimum wear to themselves and to your records. However, after an extended period of play, even the finest diamond stylus becomes worn. For this reason, it is best to have the stylus inspected annually, or whenever it appears that wear or damage may be a problem.



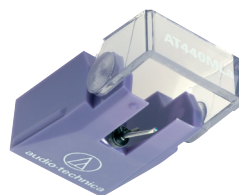
Counterfeit

Real

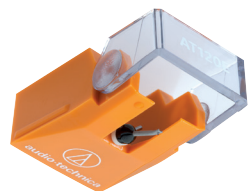
Only A-T styli with the circle monogram will provide the same level of performance.



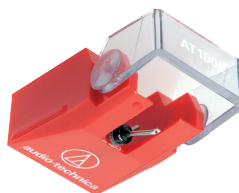
ATN150MLX



ATN440MLb



ATN120Eb



ATN100E



ATN5V

Replacement styli (PC 106-MC 520)

MicroLine™ replacement styli

ATN150MLX

EAN 4961310031206

Replacement stylus for AT150MLX

The **ATN150MLX** stylus is compatible with AT150ANV cartridge.

ATN440MLb

EAN 4961310129668

Replacement stylus for AT440MLb

The **ATN440MLa** stylus is compatible with AT440ML, AT140ML, AT140LC cartridges.

Elliptical replacement styli for para-toroidal VM cartridges

ATN120Eb

EAN 4961310129682

Replacement stylus for AT120E

The **ATN120E** stylus is also compatible with **AT120ET**, **AT120E/II** cartridges
(see note 4 page 27).

ATN100E

EAN 5055145748008

Replacement stylus for AT100E cartridge

The **ATN100E** stylus is also compatible with **AT100E/G** cartridge

Conical replacement styli for para-toroidal VM cartridges

ATN5V

EAN 4961310120269

Replacement stylus for AT5V cartridge with stainless tension wire

Replacement styli (PC 106-MC 520)

P-mount / U-mount cartridges replacement styli

ATN3472P

EAN 5055145739631

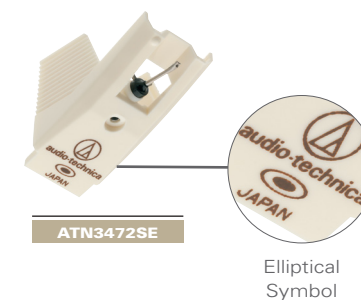
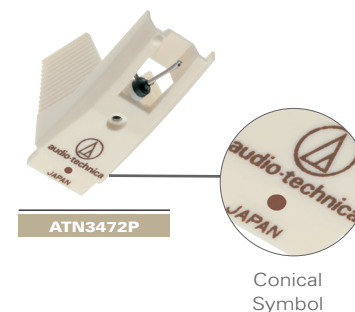
Replacement conical stylus for AT300P, AT3482P and AT3482H/U

ATN3472SE

EAN 5055145748022

Replacement elliptical stylus for AT311EP

The ATN3472SE is also compatible with AT92ECD and AT301EP.



Replacement styli for ATP-2, ATP-1 and ATP-2XN cartridges

ATP-N2

EAN 4961310059507

Replacement stylus for ATP-2 cartridge

The ATP-2 was included with AT-PL120 turntable from 2005 to 2010.

The ATP-N2 is also compatible with ATP-2, ATP-1 and ATP-2XN cartridges.



Elliptical replacement styli for AT95E cartridges

ATN95E

EAN 4961310062484

Replacement stylus for AT95E cartridge

The ATN95E is also compatible with discontinued models AT93 and AT95.



Conical replacement styli

ATN91

EAN 5055145702116

Replacement stylus for AT91 cartridge

The ATN91 is also the compatible stylus for CN5625AL and AT90 discontinued cartridges.

The ATN91 is also the upgrade replacement styli for AT3600L.

The tracking force of AT3600L equipped with ATN91 is 2g, do not upgrade from ATN3600L to ATN91 when your tonearm does not allowed tracking force adjustment.



ATN3600L

EAN 5055145748039

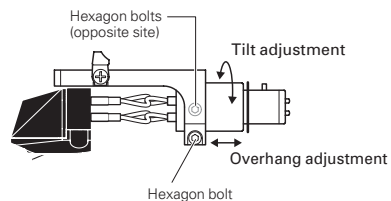
Replacement conical styli for AT3600L cartridge

This ATN3600L styli is compatible with the following cartridges:

AT3600 - AT3600L - AT3601 - AT3651 - AT3650L - AT3650C - AT3650 - AT3626

This is also the replacement stylus for turntable models Audio-Technica LP60USB and LP60.





AT-Ti15ANV



AT-LH13/OCC



AT-LH15/OCC



AT-LH18/OCC



AT-MG10



AT-LT13A



AT-HS10SV



AT-HS10BK



AT-HS1

Removable headshell for half-inch cartridges (PC 107-MC 520)

AT-Ti15ANV

EAN 4961310115081

Machined pure titanium limited edition headshell

- High rigidity pure titanium body reduces unnecessary vibration and helps reproduce a clear sound.
- Built-in damping material, HANENITE is high-damping rubber, which is excellent at absorbability such as shock or vibration, and transmits the record signals faithfully.
- Pressure bonded design using gold-plated lead tip, combining hybrid conductor, containing gold clad+7N-OFC+PCOCC+OFC with 0.18 mm 12-ply quad hybrid conductor.
- 15g (excluding lead wire)
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

AT-LH13/OCC

EAN 4961310002374

13g TechniHard™ adjustable headshell with AT6101 quad wire

- Adjustable overhang and adjustable azimuth (tilt)
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

AT-LH15/OCC

EAN 4961310002381

15g TechniHard™ adjustable headshell with AT6101 quad wire

- Adjustable overhang and adjustable azimuth (tilt)
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

AT-LH18/OCC

EAN 4961310002398

18g TechniHard™ adjustable headshell with AT6101 quad wire

- Adjustable overhang and adjustable azimuth (tilt)
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

AT-MG10

EAN 4961310001957

10g headshell magnesium body

- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- Includes gold plated terminals quad wire

AT-LT13A

EAN 4961310001964

13g headshell aluminium die cast body

- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- Includes gold plated terminals quad wire

AT-HS10SV

EAN 5055145748305

10g headshell aluminium die cast body - silver finish

AT-HS10BK

EAN 5055145748299

10g headshell aluminium die cast body - black finish

AT-HS1

EAN 5055145748282

10g dj style 1/2"-mount cartridge headshell

This headshell for 1/2"-mount cartridges and 4-pin turntable arm (Audio-Technica, Technics, SME) features all-metal construction and an integral finger lift.

Accessories (PC 107-MC 520)

AT6101

EAN 4961310001650

Cartridge to headshell PCOCC lead wires

- Perfect Crystal OCC quad wire (PCOCC high purity oxygen free conductor)
- 0.12mm x 22 core strand construction
- 24K gold plated crimped lead tip



AT6101

AT618

EAN 4961310000844

Disc stabilizer

- 600g
- Holds record firmly in place stabilizing the record



AT618

AT607

EAN 4961310000080

Stylus cleaner liquid with brush applicator

- 10ml volume
- Applicator brush is attached to the cap for ease of use



AT607

AT6012

EAN 4961310000226

Record care kit

- Scientific record-care formula gently removes microdust and other contaminants, dissolves fingerprints, and eliminates static electricity
- Velvet brush pad reaches into grooves
- Inner reservoir directs the record care solution into brush pad's leading edge
- For LP/EP use only (do not use for Shellac records)
- A two-ounce bottle of A-T Record Care Solution is available separately as AT634



AT634



AT6012

AT634

EAN 4961310084073

Record care solution

- One bottle supplied with AT6012 record care kit

AT615

EAN 4961310001698

Turntable leveler

- Precise level for horizontal adjustment of turntable
- Machined aluminium housing

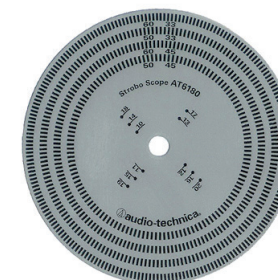


AT615

AT6180

EAN 4961310070687

Stroboscopic disc (50 Hz / 60 Hz) 33 and 45 rpm



AT6180

P20008

EAN 4961310059613

Non-magnetic screw driver



P00009

EAN 4961310059606

Anti-static stylus brush



Cartridge-making Dictionary Audio-Technica's guide to cartridge-making terminology

33rpm

very often denotes 12" LP Vinyl records (1949-Today), that should be played at a speed of 33 1/3 rpm, rpm stands for Rotation Per Minute.

45rpm

45rpm very often denotes 7" Vinyl records, (1949-Today) that should be played at a speed of 45rpm, rpm stands for Rotation Per Minute.

78rpm

78rpm very often denotes 10" Shellac SP Gramophone records (1925-1950) that should be played at a speed of 78rpm, rpm stands for Rotation Per Minute.

Anti-skating

When the record is in play, the friction between the stylus in the groove of the record and the length of the arm (the distance between the tip and the arm bearing) creates a force that pushes the cartridge toward the center of the disk. Anti-skating creates a force that pulls the arm towards the outer edge of the disc to compensate it. Because records don't have a constant amplitude, a static compensation will never totally cure the problem. It is a matter of balance. Badly set anti-skating will produce channel balance and distortion issues. When the anti-skating is set too high, the left channel will distort during loud passages, while on the other side if it's too low, the right channel will distort. Also the amount of anti-skating depends on the shape of the tip. Conical stylus tends to require more anti-skating (due to the amount of friction generated by their shape) than more complex shapes (Line contact or Micro linear).

Azimuth (see also Tilt)

For magnetic tape drives, azimuth refers to the angle between the tape head and magnetic tape. For phono cartridges, Azimuth is the angle between the surface of the record and the vertical axis of the cartridge.

Note the difference between cartridge removable head shells: some models such as the "Technihard series" (page 30) feature an "azimuth" adjustment. This feature is particularly useful when it is not provided by the tone arm itself.

Bonded diamond

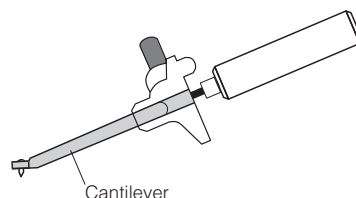


Bonded diamond refers to a stylus where the diamond tip is glued on a metal shank that is itself glued into the hole of the cantilever. This construction may increase the mass of the overall tip and affect transient reproduction compared with nude styli that are preferred and used on higher-priced models.

Boron (boron cantilever)

Boron is a chemical element from the metalloid family, extracted from Borax and Kernite. Its atomic number is 5. Boron is used for high-end cantilevers due to its lightweight and high-rigidity properties. It reaches a score of 9.5 on the Mohs hardness scale (for reference Diamond scores 10 and Aluminium 3).

Cantilever (stylus cantilever)



Styli are principally made of three components: Stylus Tip, Stylus Cantilever, and Stylus Suspension. The cantilever is a tiny suspended "arm" (solid or pipe) that holds the Diamond Tip on one end and transfers the vibrations to the other end where the Magnets (in case of MM cartridges) or the Coils (in case of MC cartridges) are housed. Different materials are used to make a cantilever: Aluminium, Saphyr, Beryllium, boron... The lighter and stiffer being the best.

Cartridge (Phono Magnetic Cartridge)

The phono cartridge is the transducer used for the playback of gramophone records. The phono cartridge converts the mechanical energy (vibrations) from a stylus riding in a record groove into an electrical signal that will be amplified then processed, recorded, or played through a sound system.

Channel Balance

The channel balance of a cartridge is the ability of the transducer to reproduce left and right channels in the same manner. Channel balance should be part of the cartridge specifications, it expresses the possible output difference in dB from one channel to another. A cartridge with ideal channel balance will playback any mono signal with equal level in both channels. The channel balance will be 0dB. The ratio of the signals between the two channels is specified in dB. Channel imbalance can result in several factors independent from the cartridge itself: mechanical factors include incorrect azimuth settings, misalignment of the tonearm and/or of the cartridge on the headshell, and/or improper anti-skating adjustment. Other Channel imbalance issues, independent from the cartridge or the turntable, could include mismatched cables, electronic elements such as stereo preamplifiers, speaker system, speaker positioning and/or room acoustics.

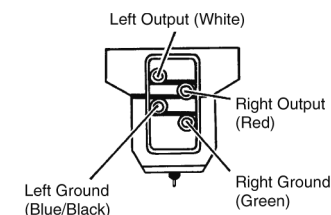
Channel Separation

The channel separation of a cartridge is the ability of the transducer to deliver only signal on the left channel of the cartridge, and nothing on the right channel when there is only signal on the left channel groove, and vice versa. Channel separation is frequency dependent. Audio-Technica indicate in the specifications the Channel separation, specified at 1kHz. For high-end cartridges, Audio-Technica provides channel separation curves, showing the separation in dB from 20Hz to 20,000Hz. A high channel separation provides a better stereo image.

Compliance

Compliance is the inverse of stiffness. Every cartridge works as a suspension, a high compliance cartridge will be suited for a low mass tonearm and a low compliance (stiffer) cartridge will be suited for a high mass tonearm. There is not a perfect compliance number, the cartridge compliance together with the effective mass of the tonearm/cartridge combination determine the tonearm's fundamental resonance. For optimal results the frequency should be maintained between 9-13Hz.

Connecting (the phono cartridge)



To install a Phono cartridge, connect the four wires of the cartridge headshell to the correct terminals on the back of the cartridge.

The four wires are colour-coded and generally labeled as follows :

Left Channel: **White**
Left Channel Ground: **Blue**
Right Channel: **Red**
Right Channel Ground: **Green**

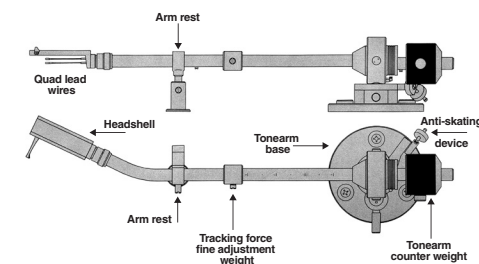
Conical



(form factor of the diamond stylus)
Also called spherical, because of the shape of the tip of the cone.
Conical shaped stylus are simple to produce, therefore it becomes the most popular when economy is a factor.

Counterweight

(Tonearm Counterweight)



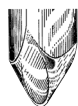
Dual Moving Magnet cartridge

Audio-Technica's patented Vertical Dual Magnet phono cartridge, unlike conventional cartridges, use the 90° V-Shape of the cutter head. The standard cutter head (used to record the vinyl master) uses two transducer coils, mounted perpendicular to each other at 45° from horizontal, to cut the channel: one in each wall of the 90° record groove.

Cartridge-making Dictionary Audio-Technica's guide to cartridge-making terminology

This way, the cartridge achieves accurate tracking, excellent channel separation, high definition of the stereo image and extreme clarity over the entire audio spectrum.

Elliptical



(form factor of the diamond stylus)
An Elliptical stylus is produced starting from a Conical Stylus, then two cuts are made in order to make the vertical contact

longer and the front to back contact narrower.

The elliptical tip follows the groove modulation with more precision than a conical tip, improving frequency response, phase response, and lowering distortion, specifically in the inner turns of the record.

Frequency Response

Frequency response is the quantitative measure of the output spectrum of the cartridge in response to the stimulus of the record groove modulation.

It is a measure of the magnitude for the output as a function of frequency; typically measured in decibels (dB). In the case of cartridge measurement, the input signal will be a constant-amplitude pure tone through the bandwidth provided by a reference record.

Impedance

The impedance is a measure of the total opposition that a circuit presents to alternate electric current. The output impedance of an electronic device is the impedance of its internal circuit "seen" by any device connected to its output. The Input impedance of an electronic device is the impedance "seen" by any source connected at its input.

Input impedance of the phono preamplifier and output impedance of the cartridge should be properly matched to achieve optimal sound. An impedance mismatch will work as a filter and degrade the sound making it dull or harsh depending on the setup. A general rule of thumb is that the input impedance of your phono preamp (also referred to as the load impedance of your cartridge) should be 10 times the output impedance of your cartridge (also called the source impedance).

Line contact



(form factor of specific stylus diamonds) Audio-Technica uses Line Contact shape stylus on several high-end cartridge styli.

The tip of the diamond is such that it allows a contact surface between 50 and 75 μm^2 . The shape is "similar" to other diamond tips known as Shibata.

Load

When connected to a phono preamp, the cartridge forms a RLC (Resistor, Inductor, Capacitor) circuit which acts as a resonant filter emphasizing certain frequencies while reducing others. In order to achieve to most linear frequency response, manufacturers specify several load values (load capacitance, load impedance and so on). By following these specifications for the choice of the phono stage, one can achieve the best sonic results.

LP Record

LP stands for Long Play or 33 rpm microgroove vinyl record format. Introduced by Columbia Records in 1948, it was adopted in the mid-fifties as a new standard by the entire record industry. It became stereophonic in the mid 60's and is still the standard format of vinyl albums today.

Magnetic cartridge (see cartridge)

MC phono input

MC stands for Moving Coil. A Phono Input on a preamplifier or Amplifier mentioning MC means that the characteristics of the preamplifier input stage, in terms of Input impedance, Gain and de-emphasis equalisation are such that it will allow you to use a Moving Coil Phono Cartridge by plugging it into this input.

Micro linear (form factor of a stylus diamond, see MicroLine™)

A specific shape of a diamond stylus, Micro linear refers to a particular "ridge shape" stylus. An Audio-Technica trademark, Micro linear styli are known as MicroLine™.

MicroLine™



Audio-Technica Trademark which denotes the Micro linear "ridge" shape stylus.

The tip of the diamond is such

that it allows a contact surface of around 115 μm^2 . The shape is "similar" to other diamond tips such as SAS, Dynavector or Namiki.

The MicroLine™ diamond is different from Line Contact diamonds, also featured on high-end styli. Line Contact tips are also known as "Shibata", providing a contact surface between 50 and 75 μm^2 .

MM input

MM stands for Moving Magnet: an MM input denotes the input stage of a preamplifier is able to handle the signal of a Moving magnet phono cartridge and the MM input also has an input impedance suitable for the output impedance of MM cartridges.

Monaural

Monophonic sound reproduction (often called mono) is single-channel audio program material or single channel audio reproduction. Monaural recording on vinyl has been replaced by stereo sound during the mid 60's. 78rpm records and Vinyl records from 1952 to 1960 are Monaural. Stereo sound on vinyl records was introduced in 1958.

Moving Coil cartridges

The MC design is a tiny electromagnetic generator, but as opposed to MM design, the 2 coils are attached to the stylus (the moving part), and move within the field of a fixed permanent magnet. The coils are much smaller than MM cartridge coils and made from very thin copper wire. This result in a low impedance, low output signal but on the other hand it is also very lightweight allowing for a better response and a more detailed reproduction. Moving coil cartridges are extremely small precision devices and as a consequence they are considerably more expensive, but are preferred by audiophiles due to measurable and subjectively better performance.

Moving Magnet cartridges

The MM design is a tiny electromagnetic generator, but as opposed to the MC (moving coil) design the stylus cantilever carries a pair of small permanent magnets. Those magnets are positioned between two sets of fixed coils forming the tiny electromagnetic generator.

As magnet vibrates in response to the stylus following the record groove, it induces a tiny current in the coils.

Mu-metal (shielding)

Mu-metal is a range of nickel-iron alloys that are notable for their high magnetic permeability. The high permeability makes mu-metal useful for shielding against static or magnetic fields.

Mu-metal is frequently used to protect low signal transformers such as the ones found on microphone preamplifier input stages or on the Cartridge step-up transformers used with MC cartridges.

Several models of Audio-Technica cartridges use Mu-metal shielding between the left and right sections of the cartridge in order to improve channel separation.

Neodymium

Neodymium is used as a component in the alloys used to make high-strength, powerful permanent magnets (neodymium magnets). These magnets are widely used throughout the audio industry in products such as microphones, professional loudspeakers, or in-ear headphones, where low magnet mass or volume, and strong magnetic fields, are required.

Nude Shank diamond



Nude



Bonded

Nude diamond refers to a stylus when the diamond glued into the hole of the cantilever is made out of one single piece of diamond.

This construction as opposed to Bonded shank (jointed) improves the mass of the overall tip and, because the vibrating signal does not have to transfer through two different materials, provides the best possible transient

reproduction. Nude styli, although expensive to produce, are preferred and used on the higher priced models.

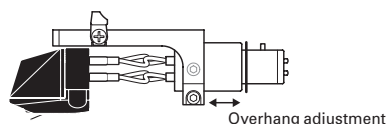
Output Voltage (of a cartridge)

Amplitude in mV of the electrical signal delivered by the cartridge for a given standard program material of the record groove. Knowing the Output voltage is an important factor: it will inform of the characteristic of the Phono input needed in

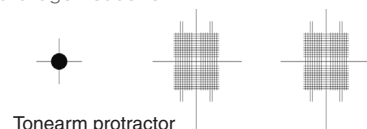
Cartridge-making Dictionary Audio-Technica's guide to cartridge-making terminology

order to accommodate a given cartridge. Output voltages may vary from under 0.1mV for the least efficient Moving Coil models on the market, up to 5mV for very efficient Moving Magnet cartridges. Such differences of more than 30dB shows that when selecting a cartridge, the selection of the associated preamplifier, with or without step-up transformer, is essential.

Overhang (Cartridge overhang adjustment)



In the case of cartridges mounted on a removable headshell, it could be necessary to adjust the cartridge by several millimeters in order for the stylus to be properly aligned with the tangent of the groove. Older tonearms provide adjustment on their bases in order to perform a proper setting using a tonearm protractor alignment system. Most modern tonearms do not provide this feature. In such a case, it is important to be able to adapt the distance between contact point of the stylus and axis of the tonearms with the Overhang adjustment provided by the cartridge headshell.



Para-toroidal coil

Para-toroidal coils are used on high-end Moving Magnet Audio-Technica cartridges, providing better channel separation, channel balance and improved transient response. Para-toroidal inductors are passive electronic components, widely used for transformer construction. The inductor with a closed-loop core can have a higher magnetic field and thus higher inductance and Q factor than similarly constructed coils with a straight core. The advantage of the toroidal shape is that due to its symmetry, the amount of magnetic flux that escapes outside of the core (leakage flux) is minimum; therefore it radiates less electromagnetic interference to nearby circuits or equipment.

Phono Preamp

Denotes a preamplifier with an input or a series of inputs capable of handling the output from a Phono cartridge.

As opposed to a "standard" line input preamp such as a Microphone input preamplifier, the Phono Preamplifier will provide the necessary gain, Input impedance matching to the output impedance of the cartridges, and the de-emphasis equalisation needed to support the signal originated from the phono cartridge playing a record.

In the case of a Vinyl record, the equalisation will usually be RIAA.

Phono Cartridge (see Cartridge)

Phono input

Denotes the pair of input connectors (L&R) of the Phono Preamp.

Pole Piece

The pole piece is a structure composed of material of a high magnetic permeability that serves to direct the magnetic field produced by the magnet. A pole piece attaches to and, in a sense, extends a pole of the magnet, hence the name.

Radius (stylus Radius)

The radius of a stylus is the distance (R) in either mil (thousandth of an inch) or μm (micro, 10^{-6} , of a meter). The conical stylus has a unique Radius which varies from 0.6 to 0.7 mil for Vinyl records. (2, 2.5, 3, or 3.5mil for shellac records). The elliptical stylus has two radii, R1 and R2, for the front and side. Standard elliptical Stylis are around 0.3×0.7 mil. Due to the complexity of line contact and MicroLine™ styli, their radius value is not always an accurate description of their shape and size.

Replacement Stylus

Stylus assembly of Moving Magnet cartridges are field replaceable. When the diamond is worn out, (between 600 and 1000 hours) or if the cantilever becomes damaged, the stylus assembly needs to be replace.

The Stylus assembly represents between 60% to 80% of the cost of a complete cartridge (depending on the nature of the diamond tip). It makes sense, not only for economic reasons but also to avoid work on

the cartridge wiring or mechanical position, to replace only the Stylus assembly instead of the complete cartridge.

RIAA

RIAA stands for: Recording Industry Association of America (RIAA), the trade organization that represents the recording industry in the United States. Early RIAA standards included the RIAA equalization curve, the format of the stereophonic record groove and the dimensions of records.

RIAA equalization

is a specification for the recording and playback of phonograph records. The purpose of the equalization is to permit greater recording times, improve sound quality, and to reduce the groove damage that would otherwise arise during playback. RIAA equalization is a form of pre-emphasis on recording and de-emphasis on playback. A recording is made with the low frequencies reduced and the high frequencies boosted, and on playback the opposite occurs.

RIAA input

(Also known as Phono input)

Input of a preamplifier section providing the de-emphasis equalization needed to support the signal originating from a phono cartridge playing a vinyl record. (Note: Most 78rpm shellac records produced after 1942 can be played with RIAA equalization, nevertheless we recommend you check the nature of the pre-emphasis used by the record company.)

Round Shank



Specifically the shape of the shank where the tip is fitted. Round shank is generally used for shapes that require no or minimal orientation (round, conical elliptical)

Shellac record

Shellac records are also described as 78rpm records or SP (Short Play)

SP record (see Shellac record)

SP stands for Short Play denoting 78 rpm Shellac records, as opposed to LP (Long Play) denoting 33 1/3 rpm microgroove vinyl records.

Spherical (diamond, see conical)

Square Shank



Square shank styli cost more than round shank to make but mounting them in laser cut holes in the cantilever locks them precisely in correct alignment with the record groove. This is the reason why they are used for shapes that need a precise orientation (Line Contact, MicroLine™).

Step-up Transformer

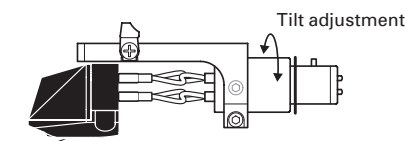
An MC cartridge has both a low output voltage (generally below 1mV) and a low output impedance compared to a MM cartridge. The role of the step-up transformer is to raise the output voltage while, at the same time, match the required impedance between your cartridge and the phono preamplifier.

Stylus Holder (Stylus Assembly)

The plastic part of an interchangeable stylus that holds the cantilever and the vibrating part, both forming the Stylus assembly.

On Moving magnet cartridges, the removable stylus assembly is held in place on the cartridge casing.

Tilt (see also Azimuth)



Tilt is the angle between the surface of the record and the vertical axis of the cartridge. This angle should be 90° in order to insure optimal channel balance.

Tracking Force

To play back a vinyl disc, the stylus must make good contact with the walls of the record groove. Excessive down force (tracking force or tracking weight) will both wear and not

Cartridge-making Dictionary Audio-Technica's guide to cartridge-making terminology

guarantee that the stylus will perfectly follow the record groove.

Audio-Technica specifies the tracking force, for each cartridge, as a range of recommended values in grams.

A cartridge given insufficient tracking force is more likely to cause damage to the groove wall than one whose tracking weight is set at the high-end of the recommended range. The cartridge could lose contact with the groove wall, or "jump", causing damage to the record as it bounces trying to regain contact.

Tracking weight (see Tracking force)

Transient Response

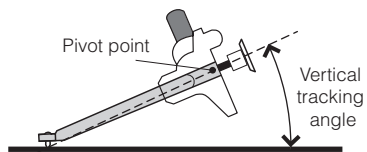
The transient response is the behaviour of a system when a signal is changing from one value to a specified higher value.

Rise time (the time required for the signal to change) and Overshoot are among the most important parameters entering under the generic definition, Transient response. A transducer having a good transient response will result in perceiving that the music material is sharp, with fast accelerations, capable of reproducing accurately and in a realistic manner the fastest impulses of musical instruments. On a record, the signal is present in the groove, the cartridge is transforming the mechanical groove of the record into an electrical current, and the transient response of the cartridge will essentially respond to fast changing sound waves present into the groove.

Under Transient response, the capacity of the moving parts such as cantilever/stylus/tension spring assembly to be controlled and not to produce parasitic oscillations is also part of the transient response quality. The capacity of the system after changing to revert to its equilibrium is also important.

Vertical Tracking Angle

Vertical Tracking Angle is the angle between the record surface and the axis "cantilever-pivot-point" to "stylus-contact-area".



Vinyl (see also LP record)

Vinyl for most people denotes a 12 inch, 33rpm, microgroove LP record. The word Vinyl comes from the chemical form of the material used to produce LP records: vinyl chloride.

An important industrial application of this

molecule is PVC (Poly Vinyl Chloride), the plastic commonly known as vinyl.

Vinyl was used for the first time to produce records by Columbia in 1946. During the early 50's the Vinyl record replaced the 78 rpm Shellac SP record as the standard.

VM™ (see Dual Magnet cartridge)

Understanding the sizes and shape of Audio-Technica stylus tips and the contact area in the record groove

Stylus sizes Stylus shape	0,6mil Conical stylus	0,2 x 0,7mil Elliptical stylus	0,3 x 0,7 mil Elliptical stylus	Line Contact stylus	Shibata	MicroLine™ stylus
Stylus front view						
Stylus horizontal cross-section						
Audio-Technica moving coil cartridges	AT33MONO AT-MONO3/LP	AT-F7	AT33EV	AT-ART9 AT-OC9/III AT-ART7	AT33sa	AT-OC9ML/II AT33PTG/II
Audio-Technica moving magnet cartridges	AT5V AT91		AT120Eb AT100E - AT95E			AT150MLX AT440MLb
Audio-Technica moving magnet P-mount cartridges	AT3482P AT300P		AT311EP			
Dimensions (see horizontal cross section)	R=0,6mil = 15,25µm	R=0,7mil = 17,8µm r=0,2mil = 5,08µm	R=0,7mil = 17,8µm r=0,3mil = 7,6µm	R=40µm r=7µm	R=75µm r=5µm	R=75µm r=2,5µm
Contact surface on record groove (stylus side view)						
Approximative contact dimensions ratio	D1/D2=1	D1/D2=1,85	D1/D2=1,60	D1/D2=2,25	D1/D2=3	D1/D2=6

⁽¹⁾ D2 represents the contact dimension at the horizontal plane while D1 shows the contact dimension at the vertical plane. These two dimensions indicate the contact area between the record groove walls and the stylus tip. D2 must be as small as possible to track small groove variations (high frequency). The total contact area should be as large as possible to minimize record wear and maximize accurate reproduction. The larger the area, the smaller the pressure from the cartridge on the record; as opposed to the smaller the area, the more pressure is applied on a specific point of the groove, leading to record wear.

We can see from the above table that the Line Contact and Micro linear shapes offer a smaller horizontal contact area leading to superior precision and high frequency transcription, while offering a larger contact area than conical and elliptical styli due to taller vertical contact area minimizing record wear.

alphanumeric product listing

Product Code	Page	Product Code	Page
AT-ART7	9	AT33sa	10
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AT-HS1	30	AT440ML (discontinued, see AT440MLb)	19
AT-HS10BK	30	AT5V	20
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AT150ANV (discontinued, see AT150MLX)	18	ATN5V	28
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AT300P	22	ATN95E	29
AT311EP	23	ATP-N2	29
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Stereo phono cartridges production line 1962

The quality and musicality of the Audio-Technica phono cartridges of today is the result of 50 years of heritage, the dedication of our design engineers and the handcraftsmanship of our production staff.



In 2010, the production of Audio-Technica cartridges was relocated to the state-of-the-art Technica Fukui facility in Echizen City, Fukui Prefecture, Japan. Technica Fukui integrates the three pre-existing Audio-Technica branches into one location, consolidating and streamlining design efforts with increased collaboration among Audio-Technica's global design teams.

A note from the Editorial Team

Audio-Technica entered the cartridge business in 1962 with AT-1 when the company was formed. After 50 years of development and to honour our founder Hideo Matsushita, we feel the need to show our achievements and to provide this catalogue of our cartridges and vinyl related products for your guidance. We had originally planned for catalogue to be 8 pages, but in the end it became 36 pages. We will have succeeded if our readers and customers can share just a small part of the passion of the people who develop and manufacture Audio-Technica cartridges.

cartridges catalogue | europe

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