



Precision Vinyl Data Pick-Up System with Waveform Recovery Circuit



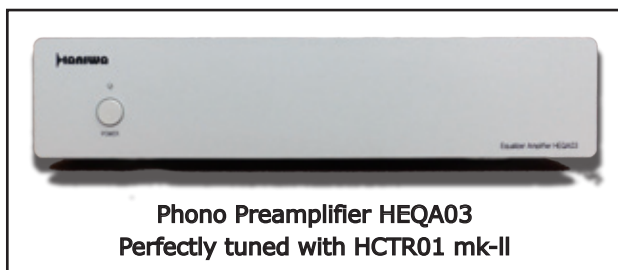
*The first analog front-end system in the world
to remove signal distortion in the current loop circuit*

The Haniwa Precision Vinyl Data Pick-Up System consists of a Moving Coil (MC) cartridge, HCTR01 mk-II, and phono preamplifier, HEQA03, and is the latest result of our long-term technology development effort to exactly and precisely reproduce music in the record groove. By precisely playing back the music on the record, we reproduce the original live sound of the performance right in your listening room. Haniwa is the only system in the world that offers innovative and fundamental solutions to problems that have prevented true and exact vinyl reproduction since the invention of the record player and vinyl playback.

When you play music on vinyl with the goal of having it sound as vivid and fresh as the performance, a major factor is the stability and impedance / inductance of the cartridge. This is commonly known when evaluating the functionality of LP playback systems in the audio industry. Haniwa Audio not only solves this problem but goes further to provide a solution to the least argued yet most critical issue: the signal distortion that affects the audio signal passing through the current loop circuit.

WAVEFORM RECOVERY CIRCUIT

— effective restoration of the original waveform

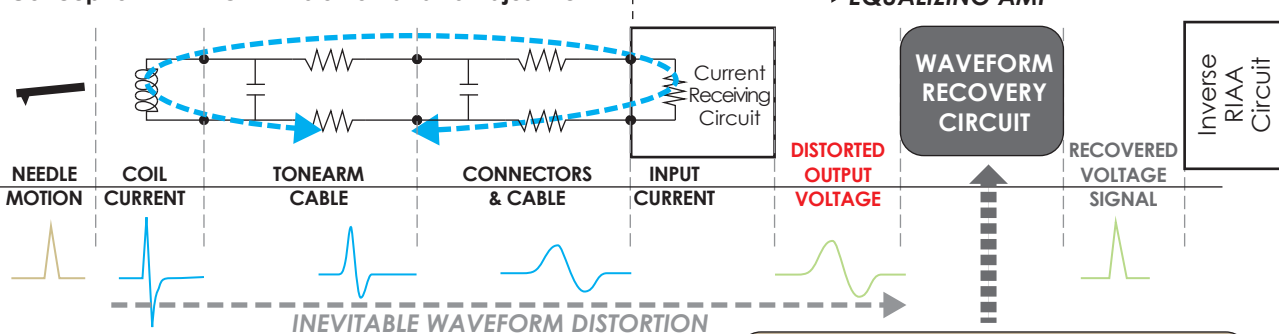


The waveform of the an input signal is severely deformed when it goes through the current loop and into the a phono preamplifier. This is inevitable since the pulse motion of a cartridge needle tracking in a record groove is always followed by a counteracting opposite motion. Adding to this problem, the coil in the MC cartridge has its own inductance which contributes to further deteriorate the waveform. These critical problems have been traditionally ignored by the audio industry. Haniwa Audio now offers a real solution to them by designing the cartridge and the phono preamplifier as one consolidated and matched **system**.

Haniwa's phono preamplifier HEQA03, contains a proprietary Waveform Recovery Circuit which compensates for the distorted signal while recovering its original waveform by canceling both the noise generated by the counteracting motion of the needle as well as noise caused by coil inductance in the cartridge. These longstanding problems can only be solved by considering vinyl playback and each component in the signal chain as a true system. Haniwa is the first and only system that has solved this problem.

INEVITABLE DISTORTION IN THE CURRENT LOOP is canceled prior to RIAA Equalization.

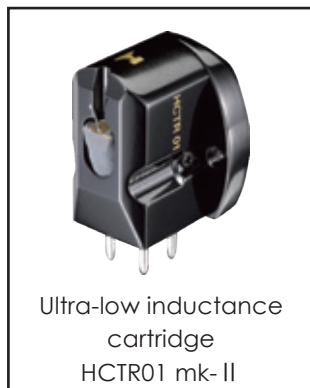
Concept of WAVEFORM Distortion and Its Adjustment



Cancels the noise signal caused by counter motion of the needle and coil inductance



Working in concert with Haniwa's phono preamplifier with Waveform Recovery Circuit, the Haniwa Moving Coil Cartridge, HCTR01 mk-II has



incredibly low impedance and inductance when compared to any other cartridge its previous model, Mark I. The new mk-II cartridge has almost zero impedance and inductance, which is only practical to use with a matched phono preamplifier with a current receiving circuit having extremely low impedance. This is in stark contrast to most MC cartridges with orders of magnitude higher impedance and inductance that use a voltage receiving circuit. The HCTR01 mk-II is capable of retrieving all of the detail and sonic information cut into the grooves while capturing

the music waveform exactly without missing any detail of the artists performance.

HCTR01 mk-II

- This MC Cartridge has ultra low impedance & inductance; $0.4\Omega/0.3\mu H$.
- This assures high sensitivity for picking up all of the information in the groove.
- It captures the most delicate sounds missed by other cartridges.
- High current in the loop circuit makes the coil dampen to stabilize the cartridge tracking.

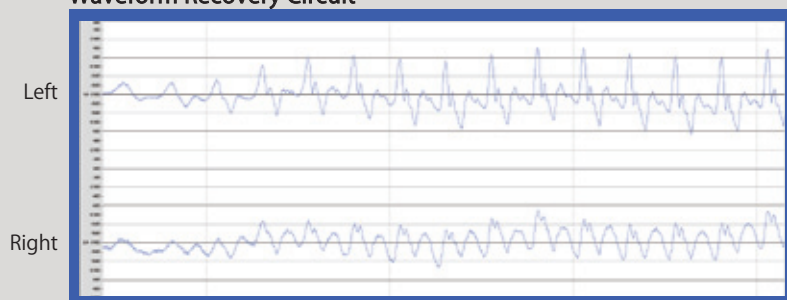
CURRENT LOOP CIRCUIT

- The lowest possible impedance is necessary for the current loop circuit to work.
- In this system, total loop impedance is; 0.4Ω (cartridge) + 0.1Ω (tonearm) + 0.05Ω (connectors & cable) + 0.25Ω (input Ω of HEQA03) = 0.8Ω (an order of magnitude lower than others).
- The lower impedance results in a much better preservation of the signal.

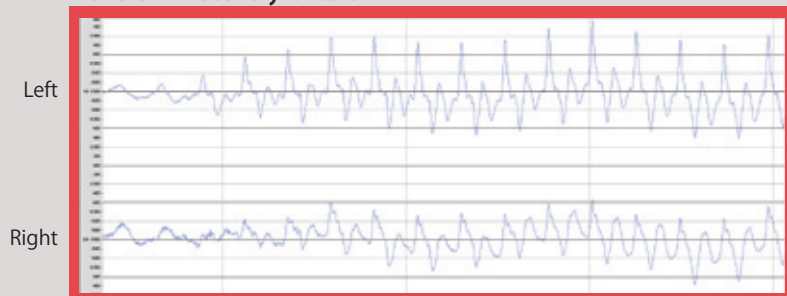
How efficient is the Waveform Recovery Circuit in recovering the original waveform?

Waveform comparison : Signal WITHOUT WRC vs. Signal processed through WRC
Music: Art Pepper meets The Rhythm Section

WITHOUT Waveform Recovery Circuit



WITH Waveform Recovery Circuit



The graphs on the left show output signals of "Art Pepper meets The Rhythm Section" played with HCTR01 mk-II and HEQA03 under the same conditions. The only difference is that the graph on the bottom exhibits the playback data compensated with Waveform Recovery Circuit enabled. It is evident that the signals on the bottom have higher and sharper peaks indicating the Waveform Recovery Circuit effectively retrieves the vigorous and vivid sound of Art Peppers saxophone.

The sharper and higher the peaks are, the clearer the time gap is between left and right channels delivering a sharp focus of the sound. This contributes to creating a clear 3-dimensional image of the music while bringing back the **REALITY OF THE LIVE PERFORMANCE.**



Ultra Low Inductance MC Cartridge **HCTR01 mk-II** & Haniwa Phono Preamplifier **HEQA03**

The Precision Vinyl Data Pick-Up System is the latest result of our long-term development effort toward ideal vinyl record playback. Our objective of ideal playback is **Exact Playback of What Is Recorded on the Vinyl Disk**.

Most MC cartridges have voltage output, and thus have high impedance and inductance to achieve this higher voltage output. This, however, also means a higher distortion of the output signal waveform. So, our first development priorities was to try to achieve the lowest possible impedance & inductance. What has been achieved, at present, is 0.4Ω and $0.3\mu\text{H}$, which are orders of magnitude lower than other MC cartridges on the market.

In order to take advantage of this unique cartridge, the phono preamplifier must have comparative performance to handle this unique signal. We chose the current receiving circuit, forming a current loop circuit with the lowest possible input impedance of 0.25Ω . At the same time, in order to make this current loop as effective as possible, the wires connecting the cartridge to the equalizer's input, must also have the lowest possible impedance. In our case, including these additional impedance values, the total loop impedance is as low as 0.8Ω . This is much lower than other current circuit type phono preamplifiers on the market. The performance and sensitivity of the Haniwa system is most notable when looking at rising edge detection of the waveform when total loop impedance gets lower than 1Ω . This is proven in our experiments when designing the system. The result is incredibly responsive dynamics and detail reproduced by the audio system.

A problem we faced with the current loop approach using our MC cartridge was distortion at the very coil, which has its own inductance even though it is low. That distortion is further deteriorated as it runs through the current loop circuit. Haniwa's solution to this difficult problem was to develop a special circuit in front of the input to the RIAA equalization circuit. Consequently, the Waveform Recovery Circuit was developed, and for the first time in the world, distortion is removed in the current loop circuit, recovering the exact waveform of the original signal in the record groove.

All these advances combined, simply mean that the music on the record groove is accurately and precisely reproduced. We believe that Haniwa accurately delivers an order of magnitude improvement in detail and sonics from your LP's.

SPECIFICATIONS

HCTR01 mk-II

Type	Moving Coil
Input Impedance	0.4Ω (AC 1kHz)
Inductance	$0.3\mu\text{H}$ (AC 1kHz)
Cantilever	Boron
Suggested Needle Pressure	1.4g - 1.7g
Weight	10g
Due to its Ultra Low Inductance & Impedance, this is only compatible with HEQA03.	



HEQA03

Input	Balanced Input circuit Input Impedance = 0.25Ω Input Connector <table border="0"><tr><td>RCA</td><td>1ch</td></tr><tr><td>Balance</td><td>1ch</td></tr></table> Switched	RCA	1ch	Balance	1ch
RCA	1ch				
Balance	1ch				
Max Output Voltage	200mV				
RIAA Curve Deviation	Less than $\pm 0.2\text{dB}$ (20 ~ 20kHz)				
WAVEFORM RECOVERY	Special circuit designed to recover the original LP waveform				
Size (WxHxD)	316 x 75 x 370 mm				
Weight	4.1kg				



HEQA03

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