

# icon Audio

## **MCTX** Moving Coil Step Up Transformer User Manual



*designed by David Shaw*

### ***The Finest Results From A Moving Coil Pick Up Cartridge***

**Welcome to the wonderful world of Moving Coil pickup cartridges!**

#### **Why use a Moving Coil cartridge?**

The master disc was "cut" using the a Moving Coil disc cutter, so it makes sense to use the same method for accurate replay. In order to extract the maximum definition from a vinyl record Moving Coil pickups offer several advantages over Moving Magnet types (much has been written about this on the internet). However the low output voltage is around 1/10<sup>th</sup> of a typical Moving Magnet (MM) pickup. This is too small to get enough signal from a typical phono preamplifier, but as the total electrical energy is about the same as an MM type it is a simple matter to use a "step-up" transformer to raise the voltage to the correct level.

Transformers are an ideal way to do this as they provide wide range of impedance matching automatically.

They also have the advantage of not needing any external power and do not degrade the sound quality by generating unwanted noise and distortion like an addition amplification would do. Most Moving coil cartridge manufacturers prefer transformers.

The Icon Audio MCTX is a simple affordable solution and is compatible with virtually all MC pickups.

#### **Should I worry about impedance loading?**

No, usually this is between 10-100Ω or more but is not critical as there are different methods of measuring, but virtually any type of MC pickups will work well. The impedance of a transformer varies according to its load, so in this sense they are self adjusting.

When connected to a conventional MM pre-amp (47K input impedance, about 3mV for full output) a Moving Coil cartridge with the MCTX transformer will behave in exactly the same way as a Moving Magnet type.

#### **The MCTX Story**

Originally designed for installation in our PS1 and PS3 phono pre-amplifiers, we found that many customers were asking for these transformers in a "stand alone" box that could be used with any type of MM phono pre-amplifiers. So the MCTX was developed.

Prior to this, some years ago, we were fortunate enough to visit the factory of a well known pick up manufacturer in Denmark. The visit included various seminars about the theory, manufacture and getting the best performance out of Moving Coil pickups. From many things we learned there were two important points:

1, MM cartridges have a problem with resonance at high frequencies, This can make for un-predictable "peaky" results depending upon loading and interconnects, and can produce more perceived distortion and noise. Perhaps just one reason why Moving Coil sounds more accurate.

2, Moving Coil cartridges sound better through a transformer, rather than an extra stage of amplification. This is because the impedance and gain characteristics of a transformer are so well suited to the job. Also, they are noise free, and have very low hum.

Some phono pre-amplifiers have an extra gain stage for Moving Coil cartridges fitted, but the results of these can often be disappointing. The sound can be mechanical and uninteresting. Whereas a good quality transformer will add nothing, whilst giving a true interpretation of the original sound.

Solid construction is important for protection against noise and vibration. We use high quality custom designed British made transformers using oxygen free copper, drawn into extremely thin wire. It is then hand-wound on to the rare earth metal formers. These are triple screened with mu-metal for maximum hum elimination. Then mounted on a stainless steel and alloy chassis using high quality gold plated PTFE terminals.

Here at Icon Audio we are big fans of their Moving Coil range.

Here's Ortofon say:

## Why use a transformer?

Step-Up Transformers (SUT) are a serious option for anyone who owns a Moving Coil (MC) cartridge, one that can significantly improve both the sound quality and sonic character. Quite simply, a good transformer is the best way to audition an MC cartridge with the highest performance possible.

Since the output of MC cartridges is lower than that of a Moving Magnet (MM), higher gain is required to utilize them, such as that provided by SUTs or MC phono preamplifiers. Although both devices provide this requirement, both are fundamentally different in function and in sonic character. This is where SUTs are frequently seen as superior; they are completely passive and offer exceptional noise performance and sound quality.

This is due to the fact that the structure of harmonic and intermodulation distortion is fundamentally different between MC-preamps and SUTs. While an MC pre-amplifier has a constant resistive input impedance, an SUT has an input impedance that is frequency dependent. The harmonic distortion produced by SUTs is highest at the lowest frequencies and drops as the frequency rises, whereas in most MC preamps the distortion increases as the frequency rises. Combined with significantly lower Intermodulation Distortion (IMD), the sound produced with an SUT will be much more open, dynamic, spacious, and natural.

(reproduced courtesy of Ortofon A/S Denmark)

# QUICK SET UP GUIDE

**1 Unpack unit carefully.** Make sure that it is in good condition. It is important that you keep packaging for warranty/service return. If damaged contact your supplier.

2 Position the MCTX carefully in your system, away from devices with a mains transformer, and power cables as is practical. You can check this again when it is working. (See Hum and Noise).

3 Connect your turntable output to the INPUT RCA sockets of the MCTX. The OUTPUT of the MCTX should be connect to the INPUT of your MM phono pre-amplifier (which may be built into your amplifier). You will need a good quality screened interconnect cable with RCA plugs to do this. Note: some expensive "boutique" interconnects are NOT screened, these will pick up hum.

4 The interconnect between the MCTX and your phono pre-amplifier should be as short as is practical, to prevent high frequency loss. One meter or less is fine.

5 Most turntables have a separate wire for the "ground" of the turntable arm and chassis, this should be connected to the MCTX "ground" or "earth" terminal.

5. You can now use the MCTX. It is working in MC mode when the switch is "out". If you change to a MM pick-up cartridge the MC transformers may be "bypassed" by pressing in the middle "bypass" button. This is exactly the same as taking the MCTX out of circuit. But more convenient

## **High Output Moving Coil cartridges**

Although the output is higher than most Moving Coil cartridges, they always lower than a Moving Magnet type, so the resulting sound level may be low, often with poor dynamic range.

The MCTX is ideal for High Output MC cartridges as the loading is correct, and the transformers have no difficulty with a slightly higher output. If required we are able to add a small amount of attenuation on request.

## **General points**

1 Many problems with hi fi equipment involve connecting leads and connections which are usually either '**bad contact, or Wrong connection**'. So it's worth making sure that you have good connections and that your leads are the right way round.

2 The output of an MC cartridge is very low, typically only 0.0003V, and signals as low as 1/1,000,000V being audible, very small voltages! So it is important to have good connections all the way from the cartridge to the input of your phono stage. It can be beneficial to remove and re-insert all the plugs annually in order ensure the best connections. That includes the wires to the cartridge and headshell plug (if removable).

3 If you are using more than one cartridge the "By Pass" switch will take the transformers out of circuit enabling Moving Magnet cartridges to be used.

## **Hum and Noise**

When correctly installed there should be no noticeable increase in hum or noise at normal listening levels. If you do notice an increase in hum and noise check:

1 That the MCTX is not in the vicinity of a mains transformer, this could be in the turntable, amplifier or other unit. It may also be above or below the MCTX. You can check this by moving the MCTX into different positions whilst listening to the noise

2 If significant noise persists, it is likely that there is a "grounding" problem. This could be in either in the cables, or the turntable ground wire is not connected, or one of the plugs has a bad contact or not fitting properly. Occasionally RCA plugs will need slightly crimping or tightening to make a good contact.

No maintenance is required, but may be advantageous to occasionally press the "By Pass" button a few times in order to clean the contacts.

The wire which forms the windings of the transformer is about the same size as a human hair. This could be damaged by resistance test of a "multimeter" or by connecting it in a way it was not designed for.

Dropping the unit may also cause damage.

## **Specification & Features**

- All hand wired point to point
- Silver plated copper PTFE audio cable
- No printed circuit board to 'colour' sound
- Suitable for pickups requiring 10-500 Ohms load.
- Low output impedance
- Matching pre amp 47k (30-100K) input imp.
- "By Pass" switch for MM cartridges
- Gain = x10 or 20dB (or x1 for "By Pass")
- Frequency response 10hz to 20khz -1db
- Gold plated Input & output terminals
- Transformers made in England
- 120mm W, 56mm H, 125mm D.
- Weight 830g
- For shipping 1.2kg 200mmx200mmx170mm

(Specifications subject to change)



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***To get the best out of your unit and to save time please read this information & keep it to hand for reference***

## Final Inspection

*This amplifier has been carefully checked, tested and final adjustments made by Icon Audio in Leicester.*

*It has passed our rigorous listening test and final inspection to assure you of optimum performance and reliability.*

Date                                    ....../....../....  
Model                                   .....  
Amp Serial Number                .....  
Customer                             .....

Check transformer finish         .....  
Audio test                            .....  
Check inputs/outputs             .....  
Channel balance                    .....  
Serial No sticker and recorded   .....  
Credit card receipt                .....  
Chassis linearity                    .....

Signed off by                        .....

Notes: