

THÖRESS

Parametric . Phono Equalizer . Series

=====
"PHONO ENHANCER MKIII"

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INSTRUCTION MANUAL

Thank you for purchasing the THÖRESS Parametric Phono Equalizer!

You have acquired a highly versatile vacuum tube phono preamplifier offering MM and MC amplification with excellent signal-to-noise performance in purely active operation mode (without the aid of built-in step-up transformers) and unique on-the-fly tone adjustments by means of three 6-position rotary switches TCSW1, TCSW2, TCSW3, which we call tone selectors. The tone selectors give rise to subtle bass, middle tone and treble control functions which are highly effective tools for restoring tonal imperfections of the replayed vinyl program (eventually introduced during the recording or cutting process), implemented without involving clumsy and sound destructive conventional tone control circuitry!

The amplifier is built with meticulous hand construction using our proven point-to-point wiring techniques, whereas much care has been taken in arranging each aspect of the internal construction to ensure highest reliability, low noise performance and ease of service for many years to come. Please read the following explanations and instructions carefully to get the most out of your phono preamplifier.

INPUTS

The amplifier comprises 6 phono inputs with gain pattern (5xMC+1xMM), five inputs with 65dB MC gain and one input with 45dB MM gain (presenting a standard 47K load to the cartridge). Alternatively, a gain pattern (1xMC+5xMM) can be implemented on request. However, it is not possible to install an arbitrary MC+MM gain pattern on the amplifier for technical reasons. The cartridge loading is

(100, 200, 300, 500, 1000 / 47.000) ohms and (500 ohm/47K, 47K, 47K, 47K, 47K).

on (5xMC+1xMC) and (1xMC+5xMM) standard units respectively. Other load values can be easily installed on demand.

The MC load values installed on each individual MC gain input are printed on the rim of the rear panel for reference!

It is not possible to install arbitrary MC+MM gain patterns on the Phono Enhancer for technical reasons!

OUTPUTS

The output impedance of the amplifier is sufficiently low (around 300 ohms) to simultaneously drive (up to 3) long cable runs and line inputs with an input impedance as low as 10.000 ohms without compromising sound quality. The 3dB-down frequency under 10.000 ohm loading is still well below the audio band (lower than 5Hz, output coupling capacitance 3.3MFD). The circuit outputs terminate in 2x3 RCA jacks connected in parallel. This design choice is useful for proper (hum-free) dual-channel mono installation with single-coil cartridges, without inconvenient adaptations, as described in a dedicated paragraph of this manual.

Connect the Phono Enhancer to input 1, 2 or 3 in case our Dual Function Amplifier is used for line amplification!

PHONO EQUALIZATION AND TONE CONTROL

The gain of a phono amplifier varies with frequency in order to restore the pre-emphasis introduced to the signal during the record cutting process. Therefore a phono pre-amplifier is sometimes called PHONO EQUALIZER (Phono Entzerrer). A pre/de-emphasis characteristic is completely and unambiguously determined by a set of edge frequencies (equivalent to so called time constants)

f1 > bass roll-off, f2 > bass turnover, f3 > treble roll-off.

The phono gain rises below f2 (bass boost) and falls off above f3 (treble attenuation/roll-off) with a slope approaching 6dB/octave. The differences between the various pre/de-emphasis prescriptions established by prominent record companies in the inception of high fidelity audio are rather small, often negligible, whereas in the most cases the crucial bass-turnover frequency f2 equals 500Hz. A few examples of prominent de-emphasis prescriptions are given in terms of edge frequencies and time constants at the end of this manual.

The Phono Enhancer performs highly accurate RIAA de-emphasis when the tone selectors rest in default position,

(TCSW1, TCSW2, TCSW3) = pos(6, 6, 1) > (f1, f2, f3) = (50, 500, 2124) Hz.

RIAA is the most widely used equalization characteristic given by the NEW ORTHOPHONIC prescription established by RCA along with vinyl MICROGROOVE disc in the late 1940s, which later on was appointed as phono playback standard. Notably, the tonal footprints of individual records (even between those issued by the

same record company in the same period of time) vary much more widely than the tonal differentiation even between the most distinctive de-emphasis prescriptions, hence

Humble de-emphasis curve selectors are not suitable for restoring optimal tonal balance of analogue disc records. They are useless, misleading and puzzling to the user!

By contrast, the Phono Enhancer allows for highly impactful yet subtle tone control via edge frequency shift! Tonal manipulations of this kind have a much stronger impact in restoring a satisfactory tonal balance of a given record when adjusted

intuitively by ear

rather choosing the edge frequencies to formally suit the de-emphasis prescription associated with the record company and the vintage of the record. In order to determine selector settings which gives the most satisfactory tonal balance for a given record proceed as follows.

STEP 1

Adjust the SONIC PRESENCE with TCSW2.

Edge frequency f_2 ==> middle-tone (MITTELTON).

Listen carefully to the record with tone selectors in default position pos(6, 6, 1). Turn middle-tone switch TCSW2 counter-clockwise to a lower position if you observe a disturbing sharpness in the sonic presentation. This manipulation increases the bass-turnover frequency f_2 and such gives rise to a smoother (warmer) sonic presentation. Conversely, turning TCSW2 clockwise upwards lifts the presence of the sound image whereas the most vivid presentation is reached in pos6 (RIAA, $f_2=500\text{Hz}$).

Determining the optimal position of TCSW2 is a crucial part of the sound enhancing procedure!

STEP 2

Determine the optimal

DISTANCE AND EXTENT OF THE SOUNDSTAGE

by adjusting TCSW1.

Edge frequency f_1 ==> bass (BASS).

Lowering the position of TCSW1 lifts the low frequency response of the amplifier (relative bass boost below 100 Hz) in a subtle way and such leads to a presentation with more punch and body. Also, the sound stage will appear deeper, wider and more distant.

Weak low end extension of the program can be compensated by lowering the position of TCSW1!

The boosting effect is obtained by attenuating the mid band gain of the amplifier with respect to the low frequency end. Consequently, in order to maintain the listening loudness of the previous sound image, the volume needs to get adapted on the line device after moving TCSW1.

Adapt the listening volume in order to maintain the listening loudness after moving TCSW1:

TCSW1 moved counter-clockwise > volume(+),

TCSW1 moved clockwise > volume(-).

Moving TCSW1 counter clockwise to a lower position will also smooth out any sharpness possibly left in the sound image after step 1 has been taken. This effect is the more pronounced the lower a position has been previously chosen for TCSW2. Thus a record which is exceptionally thin and sharp sounding with RIAA settings (6/6/*) will sound more full bodied when both selectors TCSW1 and TCSW2 rest below the RIAA default positions. Since records from the early times of high fidelity audio were often cut at the low end of the audio band, the bass boost facility associated with TCSW1 (and indirectly with TCSW2) is a impactful tool for restoring the original sound image of an old recording session.

STEP 3

Tune the BRIGHTNESS and TREBLE RESOLUTION with TCSW3.

Edge frequency f_3 ==> treble (HÖHEN).

Finally, attention should be given to TCSW3. The function associated with this switch is very similar to the treble function of a conventional tone control facility, although its effect is much more subtle. Turning this knob clockwise upwards to a higher position lifts f_3 , hence reduces the amount of treble attenuation in the de-emphasis and thus leads to a brighter sonic presentation. When TCSW3 rests in position 6 the frequency response of the amplifier is flat above the bass-turnover frequency f_2 (no treble attenuation).

Many early microgroove records sound more appealing when the treble switch TCSW3 is set to an elevated position in order to brighten-up the sonic presentation. However, as an unwanted side effect of treble boosting, groove noise may become more clearly audible. So treble resolution must occasionally be sacrificed to a certain degree in order to keep the groove noise floor at an acceptable level (especially when the record in question happens to be in poor condition). The most effective method for cleaning records is described at the end of this manual.

Record cleaning is a crucial activity for all vinyl lovers who wish to fully exploit the sonic capabilities of the Phono Enhancer!

STEP 4

Verify the determined selector settings and

RECORD THE OPTIMAL CONTROL PATTERN FOR LATER REFERENCE.

Record the positions of TCSW1, TCSW2 and TCSW3 established so far as a temporary result. Then critically check and re-consider the settings by comparing and re-evaluating the sound images while switching the selectors one or two steps upwards and downwards from the previous optimum. Once a final decision upon the optimal selector settings for the given record has been made the result might be written on the record sleeve for later reference.

PHONO CARTRIDGES

Early microgroove records carry a monophonic signal written into a LATERALLY excited triangular spiral groove of constant depth. Such FIRST-GENERATION microgrooves were originally meant to get tracked by a spherical 25-micron stylus mounted to a MONO-FLEXIBLE cantilever (25-micron refers to the spike radius of the diamond/sapphire tracking tip). A mono-flexible cantilever is one which does not comply in vertical direction.

By contrast, the groove of a stereophonic record carries two signals (more or less sharply separated from each other) coded LATERALLY AND VERTICALLY into the groove by also varying the depth of the groove relative to the record surface (concomitant with the lateral groove modulation). Consequently, stereophonic cartridges have to be fitted with an OMNI-FLEXIBLE cantilever, one which complies in all degrees of freedom.

A phono cartridge with mono-flexible cantilever will seriously and irrecoverably damage the groove when it is (accidentally) used for tracking a stereophonic record!

A stereophonic cutting head produces a monophonic groove when it is fed with identical signals on both channels. A groove obtained in this manner is significantly narrower than a first-generation monophonic microgroove, due to the new groove standards introduced for stereophony, whereas a 17-micron stylus (instead of 25-micron) was specified for tracking such SECOND-GENERATION microgrooves. During the stereophonic era more sophisticated stylus profiles (Shibata, Micro Ridge, Paratrace, Gyger, van-den-Hull...) have been developed from the humble spherical 17-micron stylus in order to reduce tracking distortion and to enhance tracking ability of phono cartridges. These modern stylus profiles provide the further advantage of reduced record and stylus wear on account of an increased contact area (line contact) between the stylus tip and the groove walls.

Phono cartridges with a sophisticated stylus profile tend to (drastically) outperform cartridges fitted with a humble spherical stylus tip!

A phono cartridge with omni-flexible cantilever and a spherical 25-micron stylus can faithfully track (NARROW) second-generation microgrooves, likely with reduced tracking

ability, although this type of stylus was originally intended for tracking (WIDE) first-generation microgrooves!

Conversely, every phono cartridge with a spherical 17-micron stylus (or one of its modern derivatives) can faithfully track (WIDE) first-generation microgrooves although this type of stylus was originally intended for tracking (NARROW) second-generation microgrooves!

Stereophonic grooves are mono-compatible in a two-fold sense...

At first, every monophonic cartridge with omni-flexible cantilever (and a stylus profile suitable for early or second-generation microgroove reading) is able to faithfully track stereophonic grooves whereas the fairly well separated R and L signals are converted back into a consistent mono signal. Hereby the signal generator of the monophonic cartridge transforms only the lateral excitations of the stylus into signal while vertical stylus movements do not contribute to signal conversion. Cartridges with a monophonic generator ignore vertical stylus movements even when they are fitted with an omni flexible cantilever! Secondly, every stereophonic cartridge is able to read both, early and second-generation monophonic microgrooves faithfully, whereas identical signals are developed in the R and L channel generator coils. Hereby, the omni-flexible stylus, theoretically, is exposed to lateral excitation only. In reality vertical movements of the stylus due to groove imperfections (warp, dirt, scratches) are converted into signal and such add noise artifacts to the wanted cartridge output.

Every stereophonic cartridge is capable of faithfully track both early and second-generation monophonic microgrooves, yet it tends to produce more tracking noise than dedicated mono cartridges!

Stereophonic cartridges with a sophisticated stylus are not only suitable for faithful tracking of (early and second-generation) monophonic microgrooves, but tend to (drastically) outperform dedicated mono cartridges fitted with a humble spherical stylus tip!

The majority of currently produced high-grade monophonic MC cartridges are derivatives of stereophonic models and as such employ a dual-coil signal generator (two separate generator coils terminating in 4=2x2 output terminals) and are fitted with an omni-flexible stylus. The only difference to the corresponding stereophonic variants is that the generator coils are not arranged at a 45-degree angle to the tracking plane, as it is needed for stereophonic groove reading. Examples of omni-flexible dual-coil mono cartridges are the AUDIO TECHNICA AT33-Mono, the LYRA mono cartridges and the DYNAVECTOR DV-X1s-Mono.

Use a DYNAVECTOR DV-X1s-Mono for ultimate playback of monophonic microgroove records!

Mono-flexible single-coil MC cartridges are currently produced by MIYAJIMA LAB in Japan, all of which models (unfortunately) come with simple spherical stylus profiles. The highly outstanding TEDESKA mono cartridges made in Berlin by Hyun Lee are other examples of mono-flexible single-coil MC cartridges of current production. Whereas the ORTOFON Mono CG-25 and the EMT OMD-25 are widely known classic single-coil MC cartridges (pick-up heads). These old-timers offer an astonishingly good sonic presentation even when judged by today-s standards. However, they cause excessive record and stylus wear due to their spherical diamond profiles and tracking weights in excess of 4 grams, especially when combined with vintage tonearms without anti-skating facility. Their use is therefore questionable when maximum sound quality and preservation of valuable records is the main goal. Nevertheless, they will be an obvious choice when it is aimed to compose a setup for authentic monaural playback.

SINGLE-COIL MONO

A monophonic cartridge with DUAL-COIL generator outputs two copies of the monophonic signal and therefor allows for dual-channel mono playback within the regular stereophonic wiring scheme. However, if the 4 input terminals of a stereophonic phono preamplifier (hotL, groundL, hotR, groundR) with single-ended (non-balanced) circuit topology are wired to a SINGLE-COIL cartridge via a stereophonic tonearm cable, **in an attempt to distribute the monophonic signal over the stereo channels for dual-channel mono playback**, groundL and groundR will unavoidably meet at the cartridge terminals (2 contact pins) or within the cartridge body (2x2 contact pins pairwise internally connected in parallel). An unwanted conductive connection is formed which will evoke residual hum in the amplifier due to the so called GROUND LOOP EFFECT. This is not a peculiarity of the Phono Enhancer but holds generally for phono amplifiers with a single-ended (non-balanced) circuit topology!

Single-coil cartridges cause residual hum when they are wired to both inputs of a stereophonic phono preamplifier with non-balanced circuit topology!

The Phono Enhancer allows for hum-free dual-channel mono installation with single-coil phono cartridges on each individual input!

Monophonic MC cartridges with DUAL-COIL generator (two separate generator coils terminating in 2x2 contact pins) can be used on any MC input of the Phono Enhancer without adaptation!

The key to hum-free dual channel mono installation with single-coil cartridges in the context of with single-ended (non-balanced) phono equipment is to distribute the monophonic signal over the channels at the OUTPUT of the phono preamplifier rather than at the cartridge terminals, in the manner exemplarily described below.

SINGLE-COIL MONO INSTALLATION (with MKII and MKIII units)

Precautions at the Input

Connect the L-plug of the (stereophonic) tonearm cable with the L-jack of the desired phono input. Insert the R-plug of the tonearm cable in one of the RCA jacks (labelled SINGLE-COIL MONO) below the phono inputs. These jacks are not connected to the circuit and solely serve as dummy terminations to receive idle RCA plugs of stereophonic tonearm cables. Connect the ground wire of the tonearm cable to one of the ground terminals as usual. This installation obviously avoids the critical conductive connection between groundL and groundR and such permits hum-free amplification of the monophonic signal in the L-section of the phono preamplifier, while the R-section of the amplifier runs at idle (is not fed with signal). This wiring scheme is obviously also applicable and meaningful with dual-coil mono cartridges, although it is not obligatory for noise suppression in this case.

SINGLE-COIL MONO INSTALLATION (with MKI units)

Precautions at the Input

Insert the R-plug of the (stereophonic) tonearm cable into the R-jack of the desired phono input. Let the L-plug of the cable hang freely and isolate the armature of this plug with the aid of a small test glass (or similar accessory) in order to prevent unwanted contacts. This installation avoids the critical conductive connection between L-ground and R-ground and ensures hum-free amplification of the monophonic signal through the R-section of the phono equalizer, whereas the L-section runs at idle (is not fed with signal). This wiring scheme is also applicable and meaningful with dual-coil mono cartridges, although it is not obligatory for noise suppression in this case.

SINGLE-COIL MONO INSTALLATION

Precautions at the Output

Switch the desired single-coil cartridge active on the Phono Enhancer. Choose an unassigned input of the line amplifier. This input, in the following denoted by MON for the sake of convenient explanation, is exclusively reserved for dual-channel mono playback. STER be the line input employed for regular stereophonic phono playback fed by the Enhancer through an interconnect cable IC1 in the usual manner. Prepare an idle (ordinary stereophonic) interconnect cable IC2 in order to establish a second connection (Phono Enhancer > line amplifier), in addition to the existing cable connection IC1. On the receiver side (line amplifier) the plugs of IC2 go into the jacks of MO in the usual manner. However, on the Phono Enhancer insert BOTH plugs (R+L) of IC2 into unemployed L-channel output jacks (possible since the Phono Enhancer features 3 pairs of output jacks). This installation obviously distributes the

mono signal appearing at the L-signal output of the phono amplifier over the L+R channels of the line device (Y-connection). The system is will be ready for replaying mono records in dual channel mode with the chosen single-coil cartridge once input MO has been switched active on the line device.

Note that the system will replay the L-signal on both loudspeakers (rather than a consistent stereophonic signal) when you (accidentally) play a stereophonic cartridge through MO!

When you play a single-coil cartridge trough STE the mono signal is replayed on the L-loudspeakers only (while the R-Loudspeaker runs at idle)!

Some phono devices with non-balanced circuit topology feature a so called MONO SWITCH. Here the monophonic signal is distributed over the channels at the input (hence ground loop noise is induced), processed in the initial L and R amplifier stages (distorted in each branch), MIXED together somewhere in the middle of the circuit and then re-distributed over both channels of the following circuitry, whereas the ground loop noise introduced to the wanted signal in the initial amplifier stages cancels away during the mixing process. Obviously a clumsy and sound destructive concept!

Mono switches rely on clumsy, sound destructive circuitry and therefor are not suitable when ultimate sonics are the aim!

LATERALY ENCODED 78RPM RECORDS

The groove coding on lateral mono 78rpm records is similar to the coding of microgroove records (laterally excited triangular spiral grooves of constant depth). However, the ancient grooves are considerably wider (and deeper) than early or second-generation microgrooves and are meant to get tracked by a spherical 65-micron stylus. Stereophonic MM (moving magnet) cartridges with a 65-micron stylus tips are readily available and the performance offered by these humble pick-up devices is more than sufficiently good for adequate 78rpm playback.

78 rpm records can be adequately tracked and reproduced with a humble stereophonic MM cartridge of current production with a spherical 65-micron stylus!

Since 78rpm records were cut without treble pre-emphasis and often lack bass extension, they will likely sound best when equalized with zero treble attenuation (infinite f_3), maximal low frequency extension (f_1 as low as possible) and regular bass-turnover frequency ($f_2=500\text{Hz}$), even when the formal bass turnover-frequency associated with the record company and the vintage of the record happens to be lower than 500Hz.

78rpm records with standard grooves are likely to sound best with selector settings (TCSW1, TCSW2, TCSW3) = pos(1, 6, 6)!

Nevertheless, lower bass-turnover frequencies than 500Hz can be easily implemented on some positions of TSCW2 on demand, for those users who specialize in 78rpm playback and place importance on more finely graduated bass-turnover frequency selection.

SUBSONIC ARTIFACTS

Coupling capacitor values between the amplifier stages of the Enhancer have been carefully chosen so as to give a very low cut-off frequency while providing a certain amount of attenuation of subsonic frequencies (unwanted but not always avoidable artefacts). However, notably the FFPRe does not incorporate dedicated subsonic filtering. The amplifier will therefore pitilessly reveal subsonic artefacts which may have crept in the signal due to improper phono installation (turntable poorly isolated against structure borne noise, too low resonant frequency of the tonearm-cartridge combination, or comparable shortcomings).

The Phono Enhancer does not employ high-slope subsonic filters!

High-slope subsonic filters do not solve but mask phono installation problems while seriously compromising sound quality!

NOISE PERFORMANCE

Much care has been taken in arranging each aspect of the internal construction to ensure low noise performance of the amplifier in spite of a purely active operation mode (without the aid of passive step-up transformer gain). However, electromagnetic stray fields emitted by mains transformers or switching mode power supplies of other electronic devices positioned in the vicinity of the Phono Enhancer may under unfortunate circumstances induce hum in the amplifier via electromagnetic interference.

The Phono Enhancer requires considered placement for optimal signal-to-noise performance!

Place the Phono Enhancer on the right-hand side of the rack in order to avoid/minimize electromagnetic interference with other components of the setup!

The Enhancer outputs a pronounced switching transient (bump noise) when the input selector is moved from pos5 (MC gain) to pos6 (MM gain) or backwards. This effect is unavoidable for technical reasons. If the switching transient accidentally reaches the power amplifiers (and thus the loudspeakers), no harm will occur within a setup consisting of THÖRESS components, even when our higher power amplifiers (SE845 or EHT mono blocks) are part of the setup. However, there might be worst case scenarios beyond our imagination (solid state amplifiers with huge power output and too inertial protection circuitry, exceptionally fragile loudspeakers etc.)

where component damage may occur in case the switching transient is not blocked out within the line device.

The Enhancer also produces moderate switching noise when the input selector is moved in between the pos(1, 2,...,5). This is not a peculiarity of our preamplifier and would arise in a similar manner with any kind of phono amplifier with on-the-fly selectable MC gain inputs due to the extreme input sensitivity of such devices. The magnitude of the emitted noise is dependent on the gradation of the effective impedances (internal impedance of the cartridge in parallel with the associated load) presented to the phono circuit on adjoining inputs. The noise disturbances will obviously remain inaudible and without impact when the volume control is set to a low angle of rotation before moving the input selector.

Always turn the volume control to zero or at least to a very low angle of rotation on the line device before moving the input selector, especially before moving the input selector pos5 > pos6 or backwards!

The Phono Enhancer outputs noticeable hiss when an open input (no cartridge connected) is switched active. This is because in such a case the thermal noise produced by the cartridge load resistor R_{mc} (soldered to the input jacks) is not shunted with the low impedance generator coils of a cartridge. The magnitude of the hiss noise is proportional to the resistance value of R_{mc} .

The Enhancer is equipped with 4 tubes, (2x12J5GTGT+2xPC86) and comes with a set of new-old-stock tubes which have been carefully hand-picked to meet tight specifications.

The use of tubes with questionable characteristics may lead to a degraded noise and sonic performance of the amplifier. Even serious damage may occur in worst case scenarios!

Never pull a tube out of the socket while the amplifier is powered on!

Always deinstall the tubes and wrap them up in the original protection case before transporting or shipping the amplifier!

SETUP

To set up the Phono Enhancer power off all devices of the system and proceed as follows.

0. Do not connect the amplifier to the mains until steps 1 to 11 have been taken.
1. Make sure that the frontal power switch rests in OFF (AUS) position.
2. Bring the master power switch on the power inlet module into the ON position.

Switch off the amplifier at the power inlet when the unit will not be used for a longer period of time!

3. Move all tone selectors into default position, pos(6,6,1)=(RIAA, RIAA, RIAA), RIAA de-emphasis.

4. Bring the ground switch (GS) on the rear panel into position ERDE (earth/ground). With this GS setting the amplifier is grounded in the sense that there is a conductive connection between the central zero point of the circuit and the ground terminal of the power inlet module (and thus a conductive connection between circuit zero potential and earth/ground through the respective lead of the power chord). This connection can be interrupted by bringing the GS into the LIFT position in order to overcome multiple grounding in the setup, which typically results in hum issues due to the so called ground loop effect.

Use the GS to overcome hum issues caused by multiple grounding in the setup!

5. Remove the top lid of the amplifier (eight metric 2.5 Allen-screws to release) and install the tubes carefully. Ascertain that the guide pin of the octal base tubes is properly aligned with the socket opening! Tighten the screws properly when reinstalling the lid so as to ensure a proper conductive connection between the lid and the chassis. Take care to place the lid back on the chassis with correct orientation (5 slot stars head-on, 4 stars on the rear side).

Never power on the amplifier unless ALL tubes have been installed!

Never pull a tube out of the socket while the amplifier is powered on!

Always deinstall the tubes and wrap them up in the original protection case before transporting or shipping the amplifier!

6. Bring the amplifier into the final position. Observe the remarks made on optimal placement in the paragraph NOISE PERFORMANCE.

The Enhancer requires considered placement for noise-free operation!

Place the Enhancer on the RIGHT side of the rack to avoid/minimize electromagnetic interference with other components of the system!

7. Connect the unit to the line/integrated amplifier. Make sure that the volume control is set to zero or at least a very low angle of rotation on this unit.

Connect the Phono Enhancer to input 1, 2 or 3 in case our Dual Function Amplifier is used for line amplification!

8. Connect cartridges to suitable inputs of the Enhancer. Do not forget to connect the ground wire of the tonearm cables to one of the two ground terminals adjacent to the phono inputs. If one or more single-coil cartridges is to be used in dual-channel mono playback mode, follow the instructions given in the respective section of this manual to ensure a proper installation.

9. Choose the cartridge desired for playback with the input selector.

10. Select input STE (stereo or dual-coil mono cartridge) or MO (single-coil cartridge) on the line/integrated amplifier dependent on the type of cartridge chosen for

playback in the foregoing step, respecting the remarks made in the paragraph about dual-channel mono installation. Note that the system will replay the L-signal on both loudspeakers (rather than a consistent stereophonic signal) when you play a **stereophonic cartridge** through MO! Conversely, when you play a **single-coil cartridge** through STE the mono signal is replayed on the L-loudspeakers only (while the R-Loudspeaker runs at idle)!

11. Connect the Phono Enhancer to the mains with a 3-core power chord.

12. Power on the Enhancer while all following amplifiers (line/integrated/power) remain powered off. Wait for at least 1 minute until the warm-up process on the amplifier has come to an end.

13. Power on the line amplifier, while the power amplifier remains powered off. Again wait until the warm-up process has come to an end.

14. Finally switch on the L+R power amplifier.

The system is now ready for playback.

15. Listen to microgroove or 78rpm records and use the three tone selectors for restoring optimal tonal balance for each individual record by following the detailed instructions given in the relevant section of this manual.

When powering off the system, always switch off the power amplifiers first and then power off the other components of the system observing a delay of at least 30 seconds!

Never switch the Enhancer on or off as long as the line/power/integrated amplifiers are powered on!

FUSE

The Phono Enhancer draws a current of 0.3A/0.6A from the 230Vac/115Vac mains corresponding to a power consumption of 70 watts. It is protected with a

1A slow-blowing 5x25mm fuse

in the power inlet module. On rare occasions, the fuse may blow at the moment of switching-on due to the current spike drawn by the mains transformer in this instant. Should this condition arise more regularly it may be advisable to use a fuse with slightly higher current rating.

ULTRASONIC RECORD CLEANING

Record cleaning is a crucial activity for all vinyl lovers who wish to fully exploit the sonic capabilities of the Phono Enhancer!

The most effective method for cleaning records is the four-step method described below.

Step 1

Roughly clean a lot of records with a microfiber cleaning fabric.

Step 2

Let the records rotate in the bath of an industrial grade (6 liter, 6L) ultrasonic cleaning machine (USCM) for at least half an hour with the aid of the KUZMA rotator kit or similar device. (Note 6L machine, not a 4L or 10L device!) Use demineralized water and a few drops of dish cleaning concentrate as cleaning fluid heated up to about 45deg Celsius. Use a EMAG 60HC USCM (Made in Germany) for optimal cleaning results.

Setp 3

Take the records out of the bath one after another and vacuumize them on a conventional record cleaning machine such as the Nitty Gritty (platter with LP label size) or Okki Nokki (rubber coated full size platter!) while they are still wet. Notably, in case of the Okki Nokki the platter needs to get dried up before the record can be flipped. The vacuumizing procedure is obligatory and must not be omitted! Air-drying or blow-drying the records after the ultrasonic cleaning treatment is highly counterproductive!

Step 4

Let the record air-dry for a little while after the vacuumizing procedur and put it in a pristine sleeve.

DE-EMPHASIS (PRE-EMPHASIS) *PRESCRIPTIONS*

RCA New Orthophonic (RIAA)

(f1, f2, f3)= (50, 500, 2124)Hz > (3180, 318, 75) micro seconds.

EMI HMV (His Master-s Voice)

(f1, f2, f3)= (50, 400, 1590)Hz > (3180, 318, 100).

TELDEC (Telefunken & Decca)

(f1, f2, f3)= (50, 500, 2124) Hz > (3180, 318, 50).

Columbia

(f1, f2, f3)= (100, 500, 1590) Hz > (1590, 318, 100).

Paciffic Jazz

(f1, f2, f3)= (100, 500, 3180) Hz > (1590, 318, 50).

Decca London ffr

(f1, f2, f3)= (100, 500, 4000) Hz > (1590, 318, 40) micro seconds .

FEATURE OVERVIEW

- Highly versatile vacuum tube phono preamplifier (phono equalizer).
- 6 phono inputs with gain pattern (5xMC+1xMM) with cartridge loading (100, 200, 300, 500, 1000; 47.000) ohms. Alternatively, a gain pattern (1xMC+5xMM) can be implemented on request.

- MC gain with state-of-the-art signal-to-noise-performance in purely active operation mode (without the aid of step-up transformer gain).
- Minimalist single-ended zero-feedback schematic with passive de-emphasis installation utilizing (2x6J5GT+1xPCC88) vacuum tubes.
- Edge frequencies of the de-emphasis characteristic independently on-the-fly adjustable within wide limits by means of three 6-position rotary selectors. Real-to-reap tape NAB and IEC equalization settings can be installed on aside the phono settings on request.
- Entire range of phono equalization characteristics used by the prominent record labels throughout history can be activated by choosing appropriate selector settings. Equalization settings suitable for 78-rpm playback included. Highly accurate RIAA equalization with tone selectors in default position.
- Subtle yet highly effective tone control facilities for restoring tonal imperfections of the vinyl program, implemented without the aid of clumsy sound-degrading conventional tone control circuitry.
- 3 outputs (RCA terminals) with very low output resistance.
- Full hand construction, point-to-point wiring throughout.
- Ultra low noise mains transformer produced in-house for 230Vac (115Vac via jumper setting), 220Vac (Thailand, China-ML, Russia, Korea, Indonesia, 100Vac (Japan) or 245Vac (Australia) available on request.
- Non-magnetic aluminum casework, front and rear panel with anodized printing, powder coated lids.
- Dimensions: 434x434x154 mm, 154=134+20 (feet).
- Dimensions of the shipping box: 650x650x350 mm, weight 11.4Kg.



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**A Tribute to Professional Audio Equipment
from the Golden Age of the Electronic Tube !**

