

ASR – the ABC to understand EMITTER sound

Dear all, many thanks for your interest in ASR EMITTER. Maybe it has been noticed to you that the EMITTER emphasizes itself by doing better than other amplifiers on the mass market, so what are the **decisive factors**.

We try to list below some *FAQ*, and hope these will clear a few queries :

1) *What functions does the pre-amplifier do in home hifi systems ?*

Before the CD era, a **full function** pre-amplifier is essential for a home stereo system.

It receives signals from source components – turntables, tuners, tape deck etc. – allows the user to select which of these source signals is to be sent to the power amplifier, and adjust volume level for proper listening condition.

All of these music source are low level signals :

A full function preamp basically consist of a RIAA phono-stage, 10X gain (i.e. 20dB) line-stage and volume control, plus tape in-out facility.

Phono cartridges have an output range from $< 1\text{mV}$ up to only about several mV. Phono RIAA equalization of course is required, with a very heavy lifting phono-stage with at least 500 – 1,000 times amplification.

Whereas tape decks & radio tuners are in the range of 500 mV output capability.

Therefore the 10X line-stage is to provide the necessary additional amplification in order to boost all music source signal up to approx. 2V (high level) for adequate use with power amplifier's input sensitivity.

Also there maybe a buffer-stage before the preamp's output -- it is to provide the preamp a low output impedance & drive long interconnects to power amplifier.

*In studio recording industry, the output-buffer-stage is essential for every preamp and console, because there are **long cables** used everywhere !*

But if CD players are the main music source : this is a **high level** music source with output range from **2V** upward -- this corresponds beautifully with todays poweramp 1.5 V – 2.0 V input sensitivities -- therefore further gain in preamp line-stage is not necessary.

Tape deck or old fashioned turners are seldom used, whereas there are many stand alone phono-amps for use with LP players.

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So we are unlikely to see a true 10X gain line-level pre-amplifiers on domestic hifi market today.

In fact most modern preamps (Line amp it is called) only offer a 10dB gain, which is only about **1.5X gain for music signal from input to output !**

Most of the time these preamp volume is set at 10-12 o'clock for normal listening, the source signal is not even amplified.

This leaves the usable function of modern pre-amps to volume setting !

2) *Apart from the necessary volume setting, what disadvantage or benefit (if any) if we still keep our preamps in the systems ?*

In pursuit of high-fidelity reproduction : only disadvantage and no real benefit – unless the user has to use longer than usual interconnection cables.

Shortest signal paths is the best -- the less component in between is the best.

Every active circuit, electronics, would incur its own distortions, coloration and **noise !**

If it is not needed – why should it be there ?!

3) *Can we replace the preamp with just a passive volume control for best sonic results, if no longer than usual interconnect cables are used ?*

Unfortunately this is not the case. The reason is simple

a passive volume-control introduces the fewest electronics in the signal path; theoretically it degrades the least and is extremely transparent.

But most source components are designed to drive a relatively high input impedance, NOT the low input impedance of passive level controls !

The source component's output impedance must be added to the passive control's output impedance to find the total output impedance for driving the interconnect cables & poweramp. This total high output impedance causes high-frequency rolloff, particularly severe if relatively high-capacitance interconnects are used between passive control and poweramp.

Now there are CD machines that incorporate a variable volume output, so life is getting a little better ! But beware !

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4) *Why the Emitters are divided into separate PSU ?*

The reason is **noise and interference immunity**.

The Emitters' main amp unit is free from any AC interference, EMI radiation and transformer vibration. This is the best possible signal-to-noise ratio for the amplify circuit.

Equally important, our goal is to produce an amplifier which remains **stable** under extreme working conditions -- during complex music passages or driving difficult loudspeaker load.

Therefore, the supply into the amplify-circuit must be **as stiff as possible** – and this requires really substantial power-transformers.

The Philbert Mantelschnitt transformers the Emitters use are enormous & big (*its lamination-core is very special, so does the winding – the primary & seconding winding is a split bobbin design, works similar as an isolation transformer*).

5) *Please explain why do you use EI transformers in the PSU instead of the popular toroidals ?*

Ah, this is a good question !

Toroidals have one only advantage over EI transformers : toroidals have a more confined EMI field radiation, which is most welcomed if these toroidals are installed inside the amp unit -- but the Emitters have separate cases PSU, therefore there is no concern of this advantage.

But there are a few big advantages of EI :

Unlike toroidals, with its winding overlaps each other very closely and AC high-frequency rubbish can easily passed over from primary into secondary, our specially made (PM) EI transformers have separate primary & secondary winding bobbins – in a sense works like an isolation transformer – therefore its immunity is far superior.

Moreover, the (PM) transformers are extremely stiff at high demand loading conditions. It can stress at least 1.5 times more than its normal maximum VA rating – this is very important if the most complex music passage & difficult loudspeaker load are concerned.

6) *How unusual is the Step-relay-volume-control in Emitters.*

This **does not** work like a usual volume-control-pot in any respect.

First of all, the incoming music signal path **does not pass through** our Step-relay-control.

This is exactly the opposite to conventional volume pot : where signal must pass into so that volume can be adjusted by its resistance-divider to ground.

This is the most transparent, technically no sonic degradation in the signal path !

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7) *So how does this Step-relay adjust volume setting ?*

It can be realized as a **gain-control circuitry**.

It is to adjust the overall gain ratio of the amplify circuit. The adjustment range is divided into 75 db steps, switched via 16 individual relays each channel and micro-processor controlled.

8) *What precision is achieved from this Step-relay-volume- control ?*

0.1 dB Channel to Channel deviation throughout the 75dB range !

This specification gives the Emitter excellent pin-point 3-D sound staging, imaging and focus precision. Sound picture is simply locked into the ambient field !

9) *What improvement is the use of Battery Powersupply Unit ?*

The Battery Unit supplies clean & stable DC voltages for the Emitter's Input Stage. If any music harmonics or tiny details are lost or masked, or noise is incurred into the music signal at this very first stage, there is no possibility whatsoever to recover later.

When using the Battery Unit, the sound quality of the Emitter (Exclusive Version) attends another new dimension. The soundstage & ambience of high quality recordings can be very **realistic** – real impression. The instruments harmonics are full & intact. Very small delicate details are unfolded, spaciousness between musicians become very much easy to recognize.

Moreover, the **inherent powerful dynamic** of the music source and **listening enjoyment** reaches a highest level of appreciation, that becomes more **alive and organic**, and **soul**.

10) *Battery is battery, . and it is the cleanest possible DC source, but why the Battery Unit is made so complicated ?*

By nature battery is a chemical cell -- which means the voltage & current output from battery cells alone can be very frustrated and erratic. They are very unreliable from sonic point of view

On the other hand, batteries are heavily vulnerable to overcharging or discharging, this affects durability & life span.

These behaviour adversely affect the sound -- if only simple battery cell array are used.

Regarding the Battery Unit :

A highly sophisticated & complex **charging & monitoring circuit** is used in the Battery Unit. In fact the inside of our Battery Unit looks more like a powerful amplifier than a simple battery-cell compartment.

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The goal is to filter (yes, **filter**) the battery cell's output, monitor & stabilize the voltages during supply into the Emitter.

At the same time, the charging circuit makes sure **all** battery cells are adequately charged with full safety to 100% of the cell's capacity.

The charging circuit allows the Battery Unit remain connected with AC input endlessly without any possibility of overcharge.

Whereas the circuitry automatically switch to recharge once the battery runs into low voltage -- this is to protect the low voltage cells to become overdischarge, which is a non-reversible damage to battery life.

11) *How long the Battery Unit can supply in one charging cycle ?*

Normally it takes about 10 – 12 hours for the Battery Unit fully charged from low voltage state. The capacity of the Battery Unit is calculated **so generously**, that after one charging cycle the Battery Unit can constantly operate for more than 100 hours.

ALL charging / discharging operation of the Battery Unit is done fully automatic !

This is truly an intelligent device.

12) *Actually how **powerful** are the Emitters ?*

Unlike most of our competitors, we quote the Emitters RMS power output rating at **20 Hz to 20,000 Hz**, < **0.1 %** distortion and **both channels driven**.

At 1K Hz , distortion level is <0.02 % from 50mV to below 1dB of RMS power output !

Most amplifier products on the market **only** quote its power output rating at 1KHz , which is very misleading because music signal ranges from low to high frequency, definitely not limited in the 1,000 Hz region ! Therefore this quote & rating **does not** give a true meaning in actual power performance capability.

For example in our smallest model :

Emitter 1 : 2 X 140 Watts / 8 Ohms ; 2 X 250 Watts / 4 Ohms
 2 X 450 Watts / 2 Ohms ; 2 X 600 Watts / 1 Ohm

And with the Emitter 2 Exclusive : it is **2 X 1,150 Watts / 1 Ohm ! Stable.**

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13) *What do you mean by **stable under extreme listening conditions** ?*

From 20 Hz to 20,000 Hz and outputs 2 X 1,150 Watts into 1 Ohm load with less than 0.1% distortion, both channels driven ; this specification represents stability.

14) *Frequency response of the Emitters are from 0.1 Hz to 500K Hz (+/- 3dB), what would this mean or affect in real world music reproduction ?*

This wide range of frequency response is very important if we consider **phase-shift**, **linearity** and amplify oscillation.

Although our ear's listening range extends to around 16 - 18K Hz (?), music instruments do consist of many **un-detached** very high to ultra high frequency complex overtones, or harmonics. These harmonics provide us the recognition of a particular piece of music instrument, or tonal signature so that we will perceive as a **real** (or realistic) impression. Therefore high to ultra frequency linearity is very important !

Emitters provides ample response margin for these ultra-frequency harmonics, far much adequate that any unacceptable phase-shift is avoided.

So is the ample response range, the Emitter remains **stable** at very high frequency extension, **overload** or **oscillation** at high sonic level does not occur.

15) *Just a little concern of the high Damping Factor quoted in the Emitter's Specifications : more than 600 in Emitter 1 & > 1,000 in Emitter 2 !*

Many stereophile suggest that too high a Damping Factor will not produce good sound – as the loudspeakers are damped (?) too dead !

The answer is in twofold :

Firstly, high Damping Factor is always good in the loudspeakers' point of view – this keeps all loudspeaker drivers under well control, otherwise **music information is lost**.

However, loudspeaker drivers can only reproduce at best what info it is input into. If the input signal is distorted – the drivers can only reproduce this distorted signal accordingly !

Therefore, **high Damping Factor is GOOD provided that the amplifier's distortion level is low**.

Remarks : low distortion level throughout the widest possible frequency range is equally important, otherwise a natural, broad bandwidth response is not possible.

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- 16) *Please give some suggestion on system compatibility : what sort of source components and what type of loudspeaker-system work best with Emitters ?*

Real music performance consists of full and wide frequency spectrum – so in high fidelity music reproduction, we need **broad bandwidth response** equipments.

There have been available in recent years quite a number of very respectable CD machines; most have wide bandwidth capability with very good dynamic range ...

Analogy LP is still going strong, of course our ASR Basis Exclusive phonoamp will bring this music source into the most modern reproduction requirement.

Loudspeakers : we think this is a matter of taste, priority **and really depend on actual listening environment.**

Type of music and the size of the listening room is the most basic criteria, all govern the final decision.

Emitters, as a powerhouse in the system, should provide enormous possibility & freedom of choices.

- 17) *What installation technique should pay attention to when Emitters are used ?*

A highly substantial AC powerline-wiring system is recommended.

A dedicated powerline arranged for use with the hifi system is the best.

16 Ampere fuse gear for the powerline-wiring should be used a good margin measures. Although the AC line current draw is only a few Ampere in average for a hifi system, it is the occasional strong demand during complex music passages that matters.

Disclaimer :

Please consult a local certified electrician for proper powerline wiring systems – DO NOT DO-IT-YOURSELF IF YOU ARE NOT COMPETENT AND/OR QUALIFIED !!!!

Wiring conductors' cross section should be at least 2.5 mm sq. each phase, which can constantly handle up to approx. 25 Ampere at ambient temperature.

The 16A fuse gear recommended is to safely protect the wiring conductors from overload in the event of short-circuit.

Please be noted : amplifiers(large or small) can only works as good as its AC power intake, therefore attention should be taken if best performance is considered.

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18) *How long would the Emitters take for fully burn-in ?*

Basically each Emitter is burnt and tested in the factory before final completion. But a period of about 200 hours is advisable to completely stabilize all electronic parts.

Regarding the Battery Unit, it would certainly require additional burn-in time, since the built in capacity is enormously huge compares with its actual circuit demand.

19) *There are various updates during the years of Emitter production, what latest features is incorporated into the latest version ?*

Emitters have been evolved since its first introduction in 1980 (that is 25 years ago !). Over these years many new and better idea do come along. The basic design concept and construction philosophy are of course unaltered -- but there is available in electric industry better electronic parts and components that are simply non-exist before.

The more ready available sophisticated parts allows further **implementation**, & creativity. So various development into the product over these years can resolve all feasibility into a **technically sound concept**, that results the Emitters to become a **Classic**.

The endless evolution is to provide Emitter users unlimited music enjoyment, many years of happy listening.

20) *What is the sonic improvement with the latest Emitters ?*

There are substantially big modifications put into Emitter 1 & 2 and Exclusive Version in the year of 2005 ... so does the Battery Unit, which receives a totally new filtering-section.

These bring the Emitters to a new era of overall sonic performance – particularly much more dynamic, ultra quiet, and neutral sounding. The renowned Emitter signature remains unchanged -- stable, calm and true to the signal source. This is a completely new horizon in music enjoyment !

Please consult the local ASR importer/dealer for more info about the latest EMITTERs.

This paper has been written from our Hong Kong Importer, Jack Tsang. We thank him very much for the good explanation of the special items of the Emitter.