

KLEI PHILOSOPHY

KL (Keith Louis Eichmann), prior to 1998, had an obsession with electrons and an obsession for sonic purity, musicality, and a passion for high performance audio; the result was the Eichmann Bullet plug. KL continued to focus his attention at the atomic level with a commitment to not only preserving, but enhancing electron flow. The sonic results from the application of his theories were ground breaking. The revolutionary ideas represented a paradigm shift in cable and connector design, forever raising the benchmarks for sonic performance.

Move all electrons from Point A to Point B with the least peripheral effects and to keep them intact through their entire transition from one component to the next. This is the simple design goal of KL and KLEI's high performance audio products. Our most famous contribution to high performance audio design is the purposeful and calculated difference between the return and the signal carrying conductors with benefits to the signal flow – this is the essence of KL's Eichmann Ratio™.

In every product design we strive for innovation that attains better audio performance. The basic areas of connector design that we evaluate are:



Geometry/Materials/Mass – KL's Signal/Ground formulae ensure Optimum mass of Metals and Dielectrics are used to avoid skin effect, maintain structural Strength and Reliability, and minimise Reactive, EF, & EMF effects.

Controlling these effects ensures that a complete, full, and extended Signal frequency range, and their harmonics, are transmitted from Component to Component, which further ensures that the listener enjoys a complete, full, extended, detailed, involving, and musical presentation.

Metallurgy – KLEI do not waste the effort gained in the other aspects of our designs by compromising with metals less conductive than Copper or Silver.

Metal Conductivity %IACS (IACS – International Annealed Copper Standard)

- Silver – >105%
- Copper – >100%
- Silver (Machinable) – 92.5% ~ 96%
- Tellurium Copper (Machinable) – 90% ~ 95%
- Gold – 65 ~ 75%
- Aluminium – 60 ~ 65%
- Bronze – 15 ~ 48%
- Beryllium (low/high copper content) – 17% ~ 43%
- Rhodium – 35% ~ 38%
- Brass (low/high copper content) – 25% ~ 37%
- Tungsten – 31%
- Nickel – 24%
- Palladium – 16%
- Platinum – 16%
- Tin – 15%

All these fundamental elements are critical to controlling the conductivity, resistance, inductance, capacitance and minimising EMF (Electromagnetic Radiation/Fields effects), EMI (Electromagnetic Interference effects) and RFI (Radio Frequency Interference effects). KLEI's expert Knowledge, Resources, and Collaboration with respected Industry Leaders, guarantees that KLEI products can be relied on for Quality and Performance. Our R&D process is a strong balance between Theory, Design, Engineering and many hours of Testing and Listening.

Acknowledging EMF, EMI and RFI can only be controlled, and even nullified, is the first step to uninhibited high end audio. Most cable designers stumble here and in doing so narrow their products' frequency bandwidths to the detriment of the overall sound. Our cable designs draw on our experience with connectors and as such, KLEI reference cables can be trusted to deliver the true character of your system.

KLEI's definition of success... Simple! That the signal, being transmitted through connectors and cables, remains unchanged during its journey.

Propagation of Electrical (Signal & Noise) Waves

All waves, whether sound, electrical or of another kind, react in a similar way.

As an example, take the situation of someone hitting the surface of the water in a bath tub. The wave remains unchanged as long as it does not hit an obstacle. When it reaches the edge of the tub, some of the wave is absorbed and some of it will bounce back. The behaviour of the wave varies because the material in which it is traveling has changed.

The same thing happens with electrical waves in a wire when they hit the plug. You do not want a wall-up. KLEI™Harmony Plugs work in a straight line with the wire. The ground in the plug is a pin instead of a massive ring. They incorporate highly conductive materials, such as pure copper and pure silver, like the wire to which it is attached. Brass, which is only 28% IACS, and Tellurium Copper, which is < 96% IACS, is not used. Mechanically, electrically and chemically, the Harmony™Plug is a continuance of your wire, *ie* one step closer to "Direct Wiring", but with the added advantage of KL's Signal/Ground formulae. KL's Signal/Ground formulae allow the connection to be even better than if you were to hard-wire your CD to your amp or pre-amp.

Given that fact, why would you want to use a big plug with a huge mass made out of a low conductivity material with a low conductivity plating (like brass, or even Tellurium Copper, with a low conductivity plating)?

We have performed many tests on a large variety of equipment and we found that KLEI products were mechanically and electronically compatible with nearly all RCA Sockets. During testing, we combined high end interconnect cables and speaker cables to a selection of RCA plugs (KLEI™Harmony Plugs in Copper, Copper/Silver, and Silver including other brands). The other brand-name plugs tested ranged in price from \$1.50 to \$75.00 (and Higher).

The results were always the same. The KLEI products, connected to any of the cables, gave superior performances. KL (Keith Louis Eichmann) was the first to invent and design most of the metal out of its RCA plugs and Bananas. KL's philosophy is to preserve and balance electron flow and the Harmony™Plugs deliver electrons in the most efficient manner to sockets.

The philosophy involves thinking small. Very small! at the electron level, and then designing a methodology to enhance electron flow. However, the proof is always in the listening, and this is where we are convinced that KL's philosophy is correct. In fact, the first time we listened to a prototype Harmony™Plug, we were amazed by the detail, dynamics, and transparency that was completely hidden when using standard RCA connectors.

KL's objective has always been to use the "optimum" rather than "minimum" amount of metal. That is, the right mass and thickness of material to support current flow but to minimise Skin Effect issues. When you listen to music via an optimum thickness of metal connector rather than a large thickness of metal connector, it is evident that a unique electrical phenomenon is occurring.

In most standard RCA plug designs, electrons have to travel through large amounts of metal, in many cases poor conductive brass. During that process electrons are impacted in a negative sense. For optimum electron flow, we require an optimum mass and thickness of the metal, *ie* KL's Signal/Ground formula. Over the years audiophiles have been conditioned to think that a quality connector needs to be large and chunky with a layer of thick gold plating, the bigger-is-better philosophy. When people hear the Harmony Plug, they hear their cables in a new light, and realize that "optimum" mass is perhaps a better philosophy, *ie* KL's Signal/Ground formulae.

Comparison testing plays a big part in the process, and helps in the understanding of how different shapes and thicknesses of metal impact on sound quality. The issue of connectors having an influence on sound is the new frontier of audio. Most people, including manufacturers, have never extensively listened to connectors. We all agree capacitors, resistors, transistors, tubes etc have a sonic signature. However we overlook the importance of connectors. Anyone who has hardwired a system will attest to the sonic improvements that are perhaps achievable with connectors removed. But in real life, we need connectors.

Most connectors rob the music of detail and add coloration and noise to the sound. Large-mass connectors tend to have a bloated, sluggish bass with an overlay of dark coloration that extends into the midrange. They sound veiled and congested with limited separation and sound staging properties, *ie* the music lacks excitement. Some low mass connectors sound thin, bright and flat with a lack of bass foundation and dimensionality.

In comparison, a hardwired system is likely to sound clean, transparent and open, with a wealth of detail. Images are separated and solid in a three-dimensional sound stage. The stopping and starting of notes is more precise, leading to an engaging, exciting sound.

In the development of our connectors, we set out to design "no plug" at all. One theory used with great effect in our Harmony™Plug design is replacing the standard RCA ground collar that surrounds the socket with a pin-like ground that makes single point contact with the side wall of the socket. This approach immediately eliminates eddy type distortion where the signal enters and exits the collar from multiple directions.

We also place a great deal of importance on the conductivity of material. For example, most connectors are made from brass, or Tellurium Copper (nowadays), due to low cost and ease of machining. Brass offers around 28% the conductivity of 100% IACS copper. Cable manufacturers and audiophiles take great pride in the use of high conductive wire for cables, yet terminate the cables with a lump of low-conductive brass. KLEI's connectors use either pure Copper (whose conductivity is >100% IACS), and/or pure Silver (whose conductivity is >105% IACS). We find, when used in conjunction with KL's Signal/Ground formulae, offer huge sound quality advantages over brass.

A certain amount of pressure, without it being excessive, is necessary to provide secure contact between conductive elements, to avoid capacitive problems, and the Harmony Plug is a firm fit but easy fit onto RCA sockets, with easy removal. KLEI have selected excellent engineering grade polymers that exhibit good dielectric qualities with high temperature melting point deflection.