

## **Mercury Magnetics™**

**Mercury Magnetics™** offers new, hand wound, OEM and replacement/repair transformers and chokes for the musical instrument amplifier market. We also offer a rewinding service for vintage transformer owners. **Mercury Magnetics™** can rewind a vintage transformer back to its original specs. Founded in Southern California in 1954 and incorporated in 1968, **Mercury Magnetics™** has built a solid reputation on superior quality, reliability and customer satisfaction. An obsession with great tone along with our qualifications in engineering helps us to meet our customer's requirements.

As part of our value added total customer support, the **Axiom® ToneClone™** series and any of our custom transformer designs always includes quality assurance and safety standards conformance. **Axiom® ToneClone™** transformers are not built "offshore" or "south of the border." They are 100% handmade in the USA and are backed by a money back tone satisfaction guarantee. **Axiom® ToneClone™** transformers can be found in some of the finest and best sounding modern production amps manufactured. We build transformers in the tradition of our forefathers, and when appropriate, only making improvements that they would have made if they had access to today's computer assisted designs and materials.

The available high-speed stick winding methods of the '50s and '60s made it difficult for the manufacturers at that time to scrutinize each coil, because these coils were wound simultaneously. There could be up to six or ten coils being wound at the same time. For example, in comparing the same vintage transformer model rewound for different customers in the past, we would sometimes find a missing layer, or layers that had a different number of turns. Finding vintage transformer manufacturers inconsistencies is not uncommon.

There are a lot of vintage amps today with power and/or output transformers that are going bad simply because they have aged. The tonal quality of the amp could be deteriorating along with the transformer. Paper and certain types of varnishes used in the vintage transformers tended to have hygroscopic properties. Moisture is absorbed over time and can affect the insulation system. This moisture increases the chance for high voltage breakdown and possibly adding a dull tonal quality to the amp. To make matters worse, the primary winding voltage is high enough to produce a corona effect whose ions help oxidize this insulation. Our vacuum impregnation process helps our customers to avoid, or at the very least delay, transformer aging by hermetically sealing critical areas that are potentially affected by time and moisture.

When it comes to rewinding your vintage transformer, we methodically unwind the transformer by hand. We then document, down to the smallest detail, each wind, each turn and anomaly, if we should discover any anomalies. We then rewind and reassemble the transformer by hand so it will sound like it did when it was brand new. While unwinding a customer's vintage transformer we will blueprint the transformer, documenting every layer, the space between turns, the number of turns, type of wire, and in some cases oddball gauges and half sizes. The interior of the transformer is new and the exterior of the transformer is replaced with the original material, if it is salvageable, so it will look like a vintage transformer and sound vintage as well. We attempt to use every piece of the original tranny that can be used. Imagine attention to detail like disassembling the laminations of a core, numbering each one and putting them back in the same

sequence. We also take measurements of dielectric constants, leakage reactance, and other characteristics which enables us to wind our **Axiom® ToneClone™** transformers accurately.

We DO NOT attempt to improve or alter the original tone or the original frequency response of the vintage transformer, unless requested by the customer. This rewinding service is more time consuming and is more expensive than purchasing a new **Axiom® ToneClone™** transformer, however, with our attention to detail and experience, the customer can be assured that their vintage transformer will look AND sound terrific! Many professional musicians, technicians and studio owners regard our rewinding services as among the best available.

Our customer service is second to none! Paul Patronete heads the **Axiom® Tone Clone** division at **Mercury Magnetics™**. He is an accomplished guitarist and has an experienced ear for vintage tone. Paul is more than happy to help our customers find the exact transformer to fit their tonal needs. Our website is constantly being updated with vintage and modern **Axiom® ToneClone™** transformer versions. We will probably always be missing on our **Axiom® ToneClone™** list some of the various models that people may need but please contact us to see if we have recently added your request to the **Axiom® ToneClone™** list.

We offer modern, updated versions of many of the classic transformers. We have added impedance taps for many of the classic, vintage amp transformers, which were never originally offered. Having a detailed spec for a vintage transformer is only the beginning. Breaking down into fine details the materials used and the assembly techniques that were used decades ago helps us assure our customers an accurate reproduction that recreates vintage tone. We have carefully selected the best of new and old technology to put performance and quality ahead of economy. Our transformers are hand wound and the cores are hand stacked. Some materials we fabricate in house and others, like our steel laminations, are custom ordered. Built one at a time, **Axiom® ToneClone™** transformers are only available in limited quantities because we are not automated to make them in larger quantities. If we are out of stock on a particular model there will be a lead-time to wind new **Axiom® ToneClone™** transformer. For those who are patient, the tonal rewards are great. **There is an audible difference between a budget transformers and an Axiom® ToneClone™!**

A good output transformer should go beyond its job of impedance matching. An amplifier's overall personality depends on it. A desirable output transformers distortion has more detail; the harmonics seem even and smooth. Played clean, the transformer should sound natural without harshness but within the boundaries of the authentic tone characteristic the player is seeking. Better said, we still can't make an apple into an orange. The output transformer is pretty much the last tone filter in a series of components.

Other factors such as, but not limited to, circuit design and speakers play an important roll in the tone of the amp. If one were to consider an audio amplifier as a modulated power supply, the quality of the power transformer and the choke, if a choke is used in the circuit, also affects the tonality of an amp. Ghost noting, dynamic response and/or note attack are, to name a few, characteristics that are influenced by power supply performance.

We really do listen to our customers. Any person can have a custom transformer designed and built by **Mercury Magnetics™**. Players having their high gain amps modified normally don't want their transformer to break up easily when overdriven. We can design and wind a custom transformer that will handle gobs of additional gain and still sound great! Over the years, we have had boutique amp manufacturers contact us and specify changes or additions to vintage transformers. These changes or addition met their unique tonal requirements. **Mercury Magnetics™** transformer manufacturing is all about a passion for music and great tone, really, because transformer manufacturing is not by nature a high-dollar, profitable business. We care about helping our customers find their special tone.

Up to the early 1980s there must have been dozens of companies winding transformers locally. Today I would be surprised if there were 3 or 4 still winding. It's frustrating for a transformer designer and manufacturer to have a musician describe to them a desirable tone characteristic when that can't really be put on paper. You have to at least be able to see things from a musician's perspective. This is where we feel at home. We have a decent guitar and amp collection and access to many vintage amps via our customers and friends. We try to stay abreast of what's going on in the tube amp market.

So many of the current transformer manufactures sell them cheap and dirty. Their approach is often cookie cutter and the customer usually gets what they paid for, as the old saying goes. These manufacturers primarily use bottom of the barrel "low cost" materials. Who can blame them? They must keep their overhead low to be able to sell them cheaply. Unfortunately, they are at best, barely in the ballpark of what really needs to be done if someone is serious about getting a vintage tone.

If you are lucky enough to have an inductance bridge you can perform a simple test to measure the primary inductance of a vintage output transformer and then compare the measurement to a new output transformer. You'll most likely find that the inductance on the new unit is frequently less than half of the vintage transformer. There is no way that a new output transformer starving of inductance can sound like the original vintage piece. Lower inductance is one reason why an output transformer can sound inadequate. If achieving the authentic vintage sound of the past is a priority to you, then the cheap and dirty transformers that are out there today are probably not good enough for you. The devil is in the details, and there is no substitute for doing things by hand. Because certain materials are unavailable today we make in house, specific materials and incorporate processes essential to meeting our strict manufacturing requirements. When it comes to the pursuit of great tone, we find it difficult to deny ourselves!

As you have read, everyone at **Mercury Magnetix**<sup>™</sup> goes to great lengths to make our **Axiom**<sup>®</sup> **ToneClone**<sup>™</sup> transformers sound as good as possible. To get that great tone back into your amp, have your favorite repair shop or technician get you a hand wound **Axiom**<sup>®</sup> **ToneClone**<sup>™</sup> output transformer from **Mercury Magnetix**<sup>™</sup>.

© 2004 Mercury Magnetix Inc. All rights reserved. Reproduction in whole or part without the written permission of Mercury Magnetix is prohibited.

© 2004-2005 Guitar Amplifier Magazine. All national and international rights reserved. Reproduction in whole or part without the written permission of Guitar Amplifier Magazine is prohibited.