

HOW TO SHIELD A GUITAR

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A few weeks ago, I completed <u>an article about fixing my Ernie Ball/Music Man's warped pickguard</u>. While I had all of the electronics and pickguard off of the guitar, I noticed that the only shielding on the control cavity was a small strip of aluminum tape on the pickguard where the controls were.

Now, the normal pickups in this guitar are humbuckers: a <u>Custom Custom</u> and <u>Alnico II Pro</u>. Being humbuckers, the pickups themselves don't hum. But get them near light dimmers, fluorescent or neon lights, and dubious club wiring, and all sorts of buzzing happens.

So, we'll get this straight now: Shielding will never get rid of that 60-cycle hum that is present with single coils. Single coils have their own unique, beautiful sound, and part of that admission to Tone Angeles is that hum. What shielding will do is prevent the wiring inside your guitar from acting like antennae and picking up stray signals floating around. If you want to get rid of hum in single coil guitars, you might have to switch to <u>stacked single-coil sized humbuckers</u>.

The idea of shielding is to enclose the electronics in sort of a 'cage', which rejects stray radio frequency interference. You can do this a few ways: copper or aluminum tape, or graphite shielding paint. Shielding paint looks better, but it is expensive. It isn't a good investment unless you have more than a handful of guitars to shield, and it isn't something you can just pick up at the local hardware store either.



Here are the strips of copper tape I started with...

The copper or aluminum tape was a better idea for me, since it was cheap (I am a musician, remember), and while you can even use heavy duty aluminum foil and glue, I opted to order some 3M copper tape with adhesive that is conductive, off of Ebay. This is important because the puzzle pieces of tape you cut will have to overlap- if the adhesive wasn't conductive, I would have to solder every piece of tape to each other. By the way, while aluminum is actually better at rejecting RF signals, can't easily be soldered. Since I had never shielded a guitar, I didn't know what I was in for, so I went with copper.



MY MATERIALS

Packing tape, isopropyl alcohol, a small cloth, compressed air, razor knife, copper tape, scissors, multimeter

I cleaned the cavity. There was lint, wood, and who-knows-what-else in there. I used packing tape to pick up the tiny bits. I made sure I jammed the packing tape in every little crevice, since there were lil bits 'o stuff everywhere. Then I



used some compressed air to blow out the stuff I could not get. I then put some alcohol on the cloth to 'de-grease' and further clean the painted surface.



I cleaned the back of the pickguard with tape and then alcohol too since the copper had to form a cage around the electronics.

My tape was 2" wide, so I covered the back of the pickguard. Over the pickup cavities, I used a razor knife to cut out the pickup holes, making sure no copper could be seen from the front.



...and after.

I then started cutting out shapes for the cavity. I started this with the razor knife, then soon went to scissors. Scissors were better for the strips and triangles I had to cut to make it all fit. I overlapped all of the pieces, leaving no paint showing underneath. This looks much better a few steps away than it does close up. There are a lot of little pieces!



Here, I am about halfway done.

I made sure I had a few pieces of tape angle over the top so it could contact the tape on the pickguard.



This is the back of the pickguard. The foam on the neck pickup keeps it from tilting backward when in the cavity. There, I fixed it!

I used a multimeter on set to beep on continuity. I wanted to make sure pretty much every piece of copper was electrically connected to each other, and to the ground of the electronics.



In the end I didn't have to solder anything. I will say, I did notice a few paper cut-type slices on my fingers. I didn't realize the edges of the tape were so sharp. Maybe thimbles next time? Also, the tape is sticky, so when I stuck it down, that was where it was going to stay. You can get it back up, but it will pull up any tape it is connected to.

This all took me about an hour from start to finish, not including putting the electronics back on the pickguard, restringing, and testing. However, in the end, I did take my guitar to a place where there are rows of fluorescent lights, where the buzzing was really bad – the local music store! Usually my guitar buzzes like crazy there, but it was silent. Unless I plucked a string, I couldn't even tell if the guitar was plugged in. Success! For my first time shielding a guitar, I think I did a pretty good job. And I have enough tape to do maybe two more.

So, it turns out, shielding, like wiring and restringing, is something guitarists should learn to do on their own. It's a fun and inexpensive project that will have you guitar as quiet as a scream in space.



Well the unshielded pots, and hookup wire etc., can pickup hum from various sources. So if you'd like your guitar to be its absolute quietest then shielding is the best way to go.