

Trance Audio, Inc.

*Applied Magic for Musicians*

## Acoustic Lens Pickup Installation - A Guide to the Template Method

This guide will show you how to easily and precisely place the Acoustic Lens transducers in your guitar by creating an easy-to-make cardboard template that fits your specific instrument.

Using this method you can accurately perform the installation yourself with no superglue or other messy adhesives, no special or exotic tools, and no need to drill holes or perform any special or complicated operations inside your instrument. ***Use only the provided adhesives for pickup installation; if you need more or have questions about this, contact us.***

***Please read the following instructions carefully, and please contact us by phone or email with any questions. We strongly recommend seeking an experienced guitar repairperson or luthier to drill the endpin jack hole if your instrument is not already equipped with one. Trying to drill the proper size hole without the proper tools will cause extreme damage to your instrument! Some newer instruments have a plug assembly that can be removed to reveal the proper size hole (1/2").***

For easier installation of the Acoustic Lens pickups, we now provide two tape adhesives - first, we have a special temporary tape adhesive (with white backing) that allows you to easily position the Lens and evaluate the sound immediately, in real time. This adhesive is an excellent tool for evaluating pickup placement before committing to the permanent tape adhesive (with red backing). (Permanent is a relative term; you can, of course, still remove the permanent tape when you wish, but it won't let go on its own, unlike the temporary tape.)

### PREPARATION

In order to prepare your guitar for Acoustic Lens installation, you **MUST** clean and prepare the bridgeplate first by sanding it lightly with a small piece of #100 grit sandpaper wrapped around a small sanding block (a 9-volt battery works well for this). Blow out any sawdust from the inside with compressed air, or turn the instrument upside down and shake it out. Wipe the bridgeplate clean with a clean cloth lightly moistened with water or Windex™, and allow it to dry for at least 10 minutes.

**NEVER use Naptha™, lighter fluid or any other cleaners like this to clean the bridgeplate or pickup, as these will leave deposits behind that will destroy any chance of obtaining a proper bond.** Acetone can be used to remove any stubborn adhesive left behind, but use it sparingly, and don't get it on the finish of your instrument.



**Once you're finished preparing your guitar, you will need the following items:**

- Cardboard (1/8" or thicker)
- Scissors
- X-acto™ or other razor knife
- Cutting board or suitable flat cutting surface
- Small ruler
- Golf Tees or 1/8" dowels, bamboo skewers, etc.
- Pencil or pen (fine point is best)
- Temporary and Permanent adhesive tapes provided with your Amulet system
- Pickup clamp (included with system)
- Small mirror that will fit through the soundhole of the guitar (optional)
- Flashlight (optional)



Using the scissors, cut a 2" x 3" template blank from stiff, corrugated cardboard. Thicker cardboard (1/8" or better) is necessary to make it easy to locate the pickup properly in the template. Thinner cardboard will make it difficult to find the edges to accurately place the pickup by feel. The box we ship our systems in will perform very well for this, and you could even use thicker material such as foamcore board if available.



Using the ruler, draw a line about 1/4" inside along one edge.

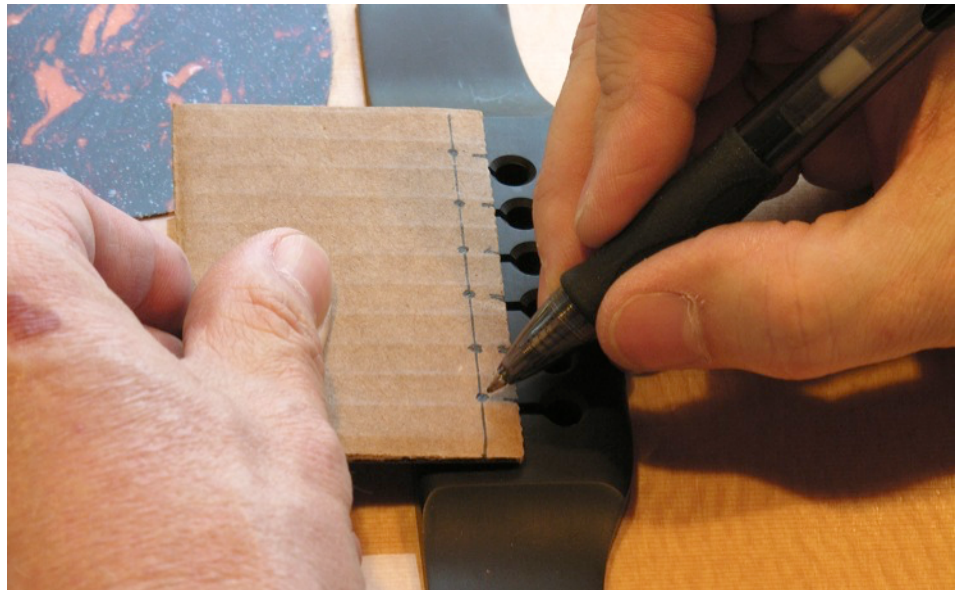
Using a small set of cutters or pliers, remove the saddle from the guitar (if possible) by gently lifting each edge until it is clear of the bridge. Make a note of which way it is installed in the guitar, and set it aside.





Place the template centered next to the bridgepin holes. Mark the position of each of the holes along the edge of the template.

Mark the position of each of these holes along the line.



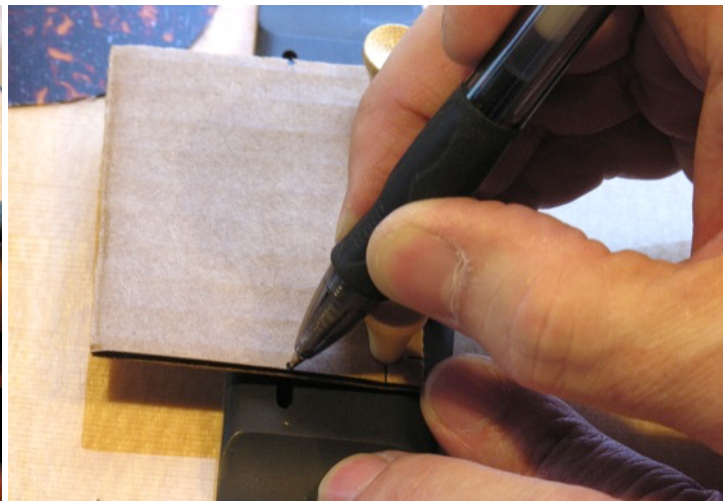
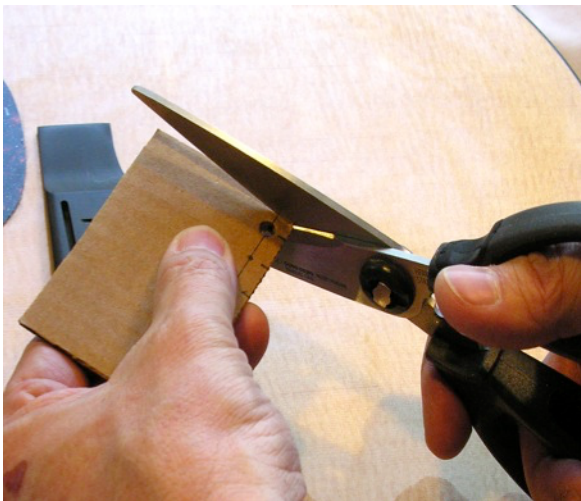
Using a pen, pencil or other sharp object, poke a hole in the outer two holes only.

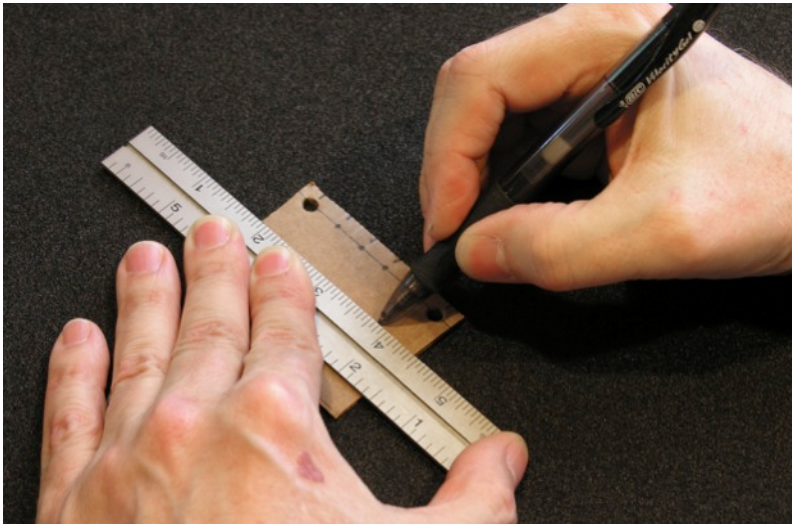
Carefully enlarge the holes to the proper size using the golf tees (or other).



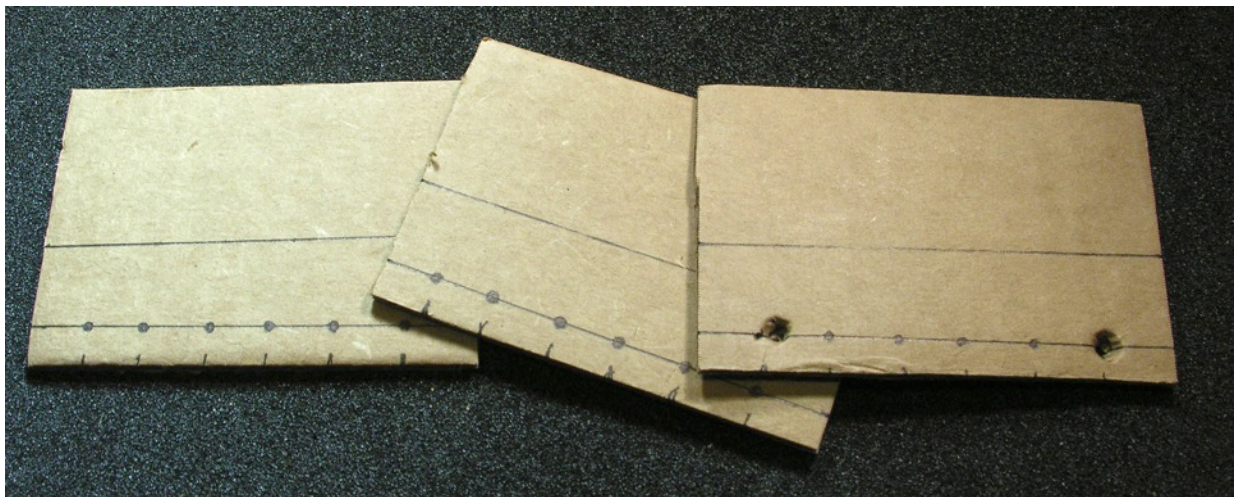
Place the template on the instrument bridge, and place the tees in the two outer holes to hold the template in place.

Making sure that the template is parallel to the top of the guitar, mark the location of the saddle slot on each side of the template. *If you can't see the saddle slot on each side, trim the width of the template so the saddle slot is just visible on each side so you can mark it.*

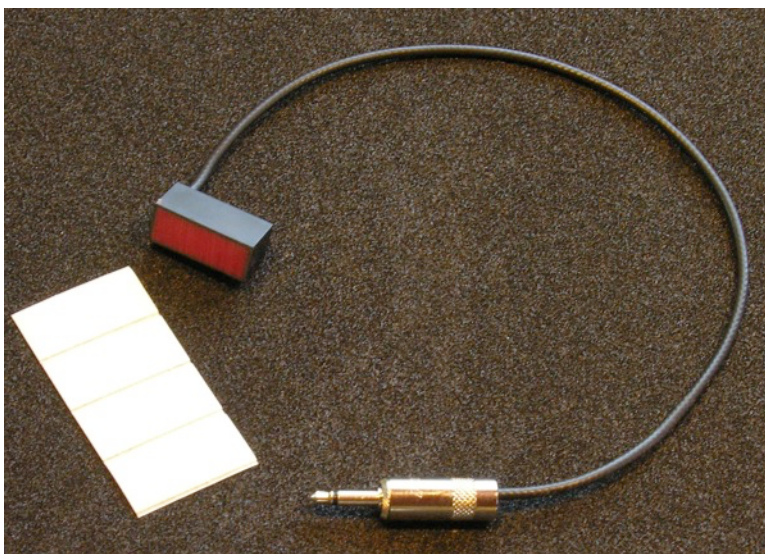




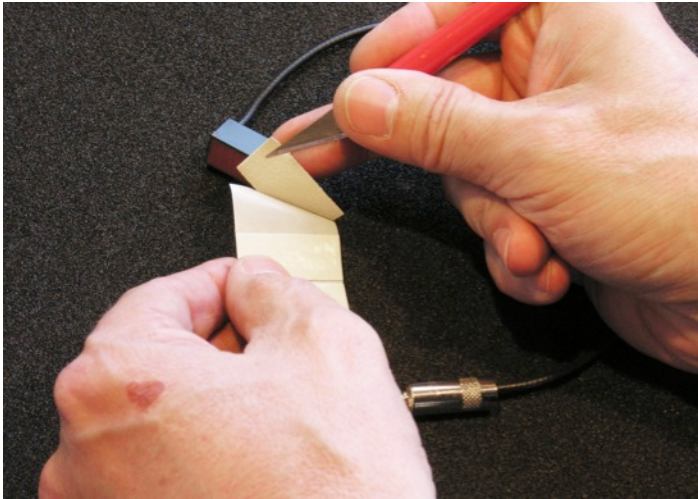
Remove the golf tees and place the template on a flat surface. Use the ruler to line up the two saddle slot marks on the template, and draw a line connecting them with the pen or pencil.



Create several copies of your template including the marks for the location holes. If you decide to make adjustments later, this will give you a fresh blank to work from without having to recreate your work from scratch.

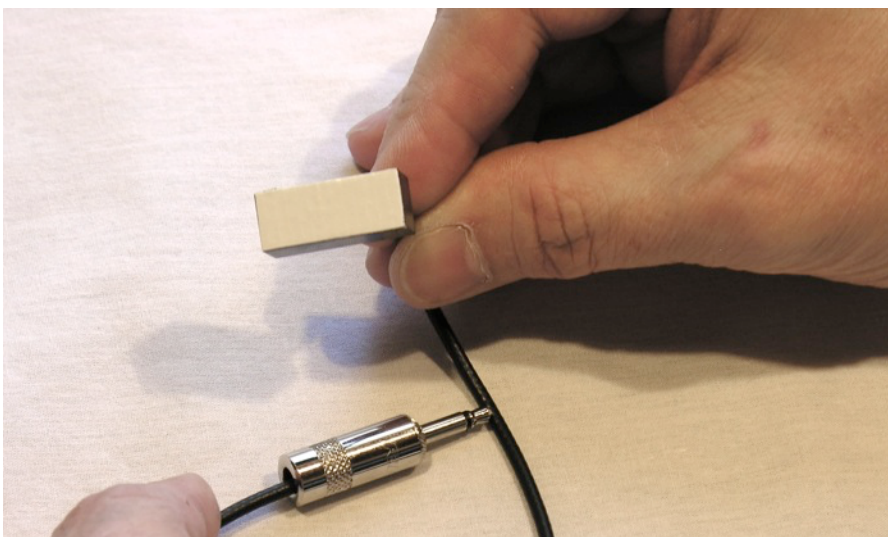
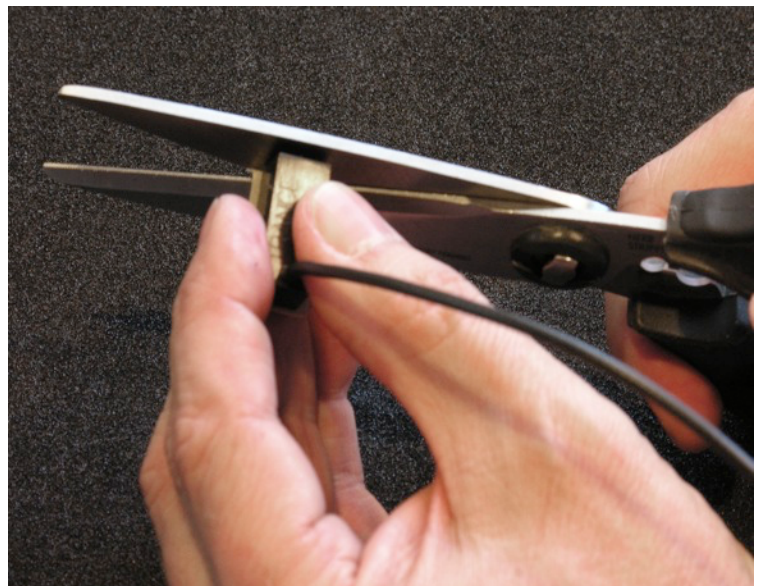


Apply a strip of the temporary white adhesive to the red sensing surface of each of the pickups.

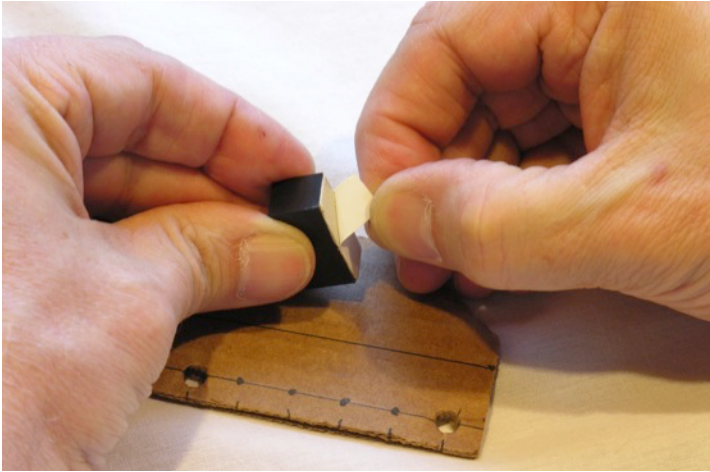


Using your thumb, press the adhesive over the entire red sensing surface of the pickup to bond it completely and securely.

Trim the excess adhesive from the pickup on all sides, using a sharp pair of scissors...

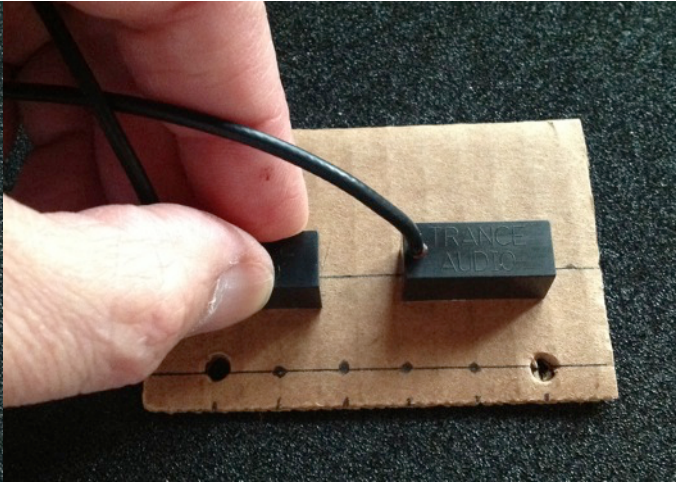
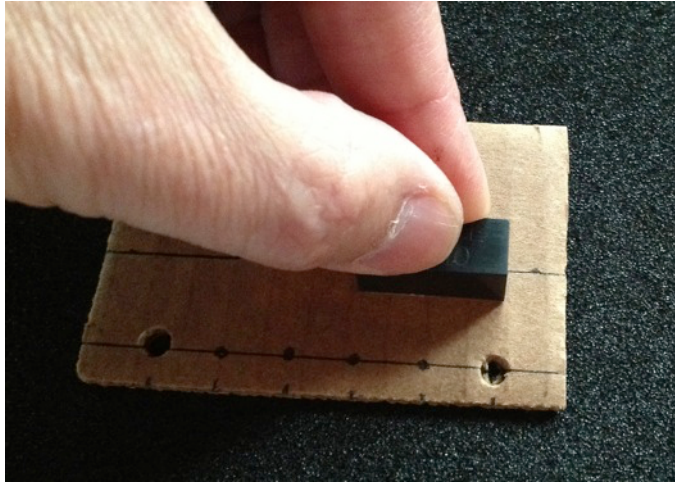


...so you end up with the tape aligned with the edges of the pickups.



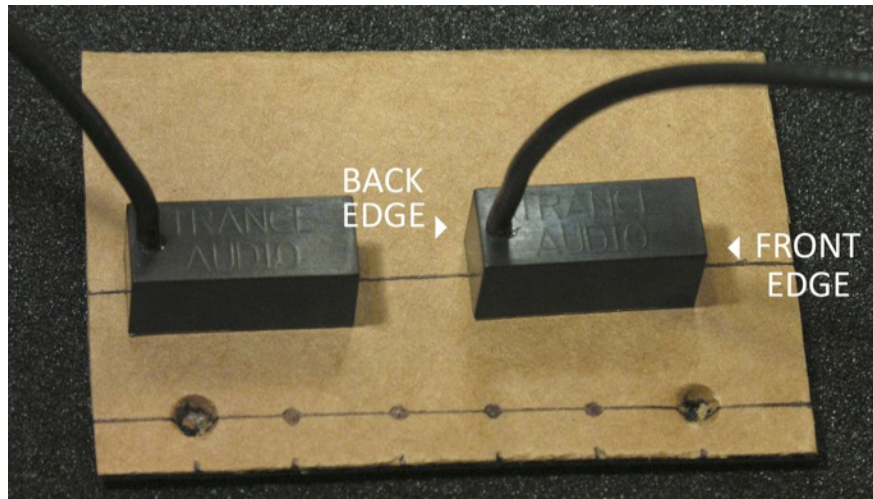
Remove the backing paper from the adhesive (an X-acto blade can be helpful to help peel away the edge of the paper)

Place the pickups centered on the saddle line of the template in the positions shown and described below. *Weaken the stickiness of the adhesive first by pressing on it with your thumb for a while. The adhesive is very sticky, and you want to be able to apply and remove the pickups to adjust and locate them correctly without damaging the template.*



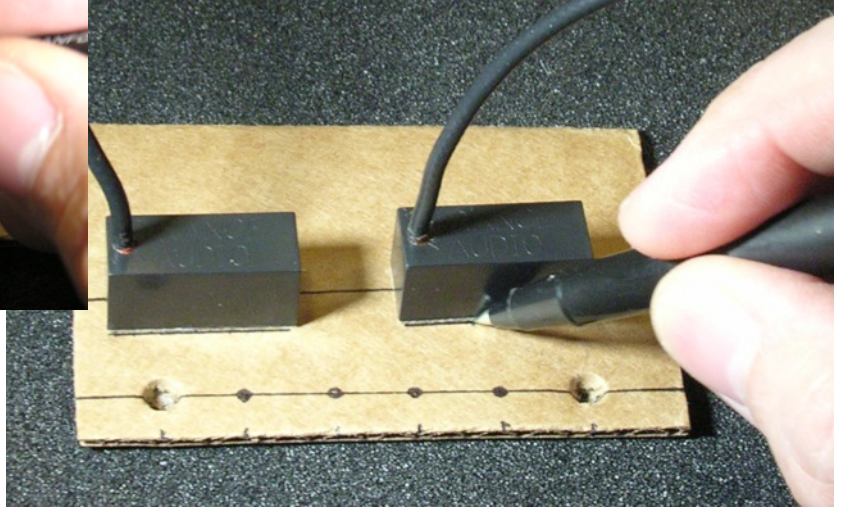
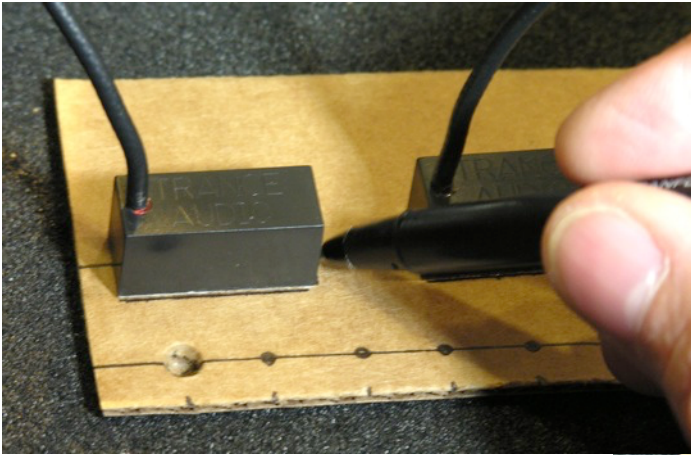
The front edge of the treble side pickup is lined up so it is in the center of the hole for the high E string.

The bass side pickup is placed so the front edge is about 2/3 of the way between the A and D strings, closer to the D string. Both pickups are centered on the saddle line.

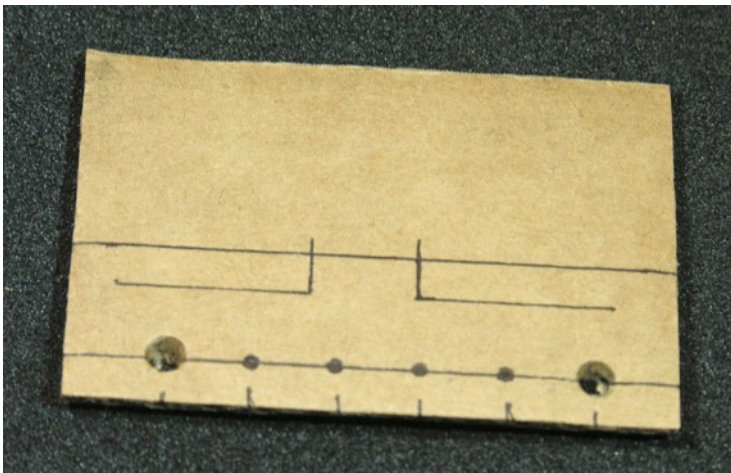


Make sure that the pickups are far enough away from the bridgepins (represented by the golf tee holes on your template) so that the string ball ends won't crowd against them when installed. Some guitars have the bridgepins very close to the saddle, so this is a good time to make sure that there's enough room. If things look too close, you can move the pickups slightly off the saddle line towards the sound hole to make enough room. This is also worth checking if you plan to install the pickups closer to the bridgepins. We will talk more about this and show a picture of the location later in this document.

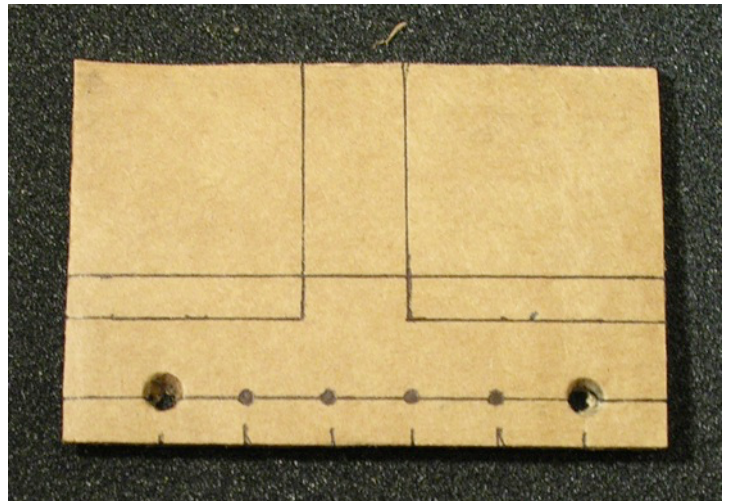
Once you've got the pickups placed correctly, use the pen or pencil to outline the sides of the pickups closest to the marked bridgepin holes, and the two inner sides of the pickups that face each other.



Remove the pickups, and you get this...



...then using the ruler, extend these lines to the edges of the template so that it looks like this.

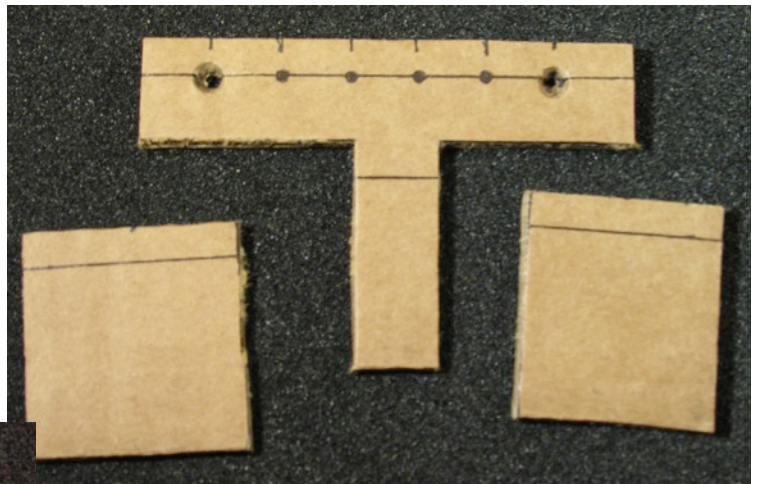




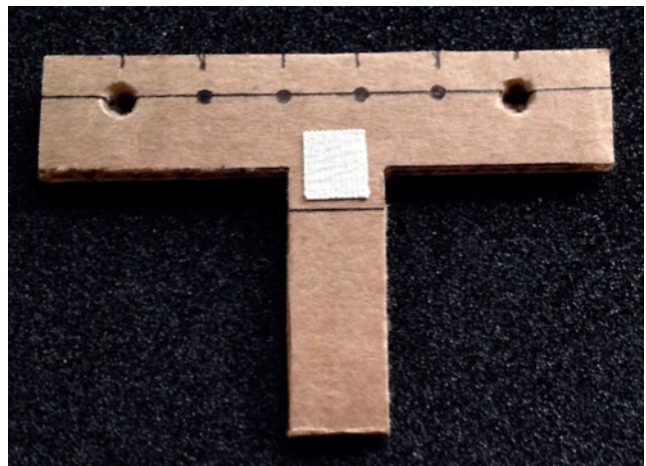
Using the ruler and the X-acto knife, carefully and cleanly cut away each side of the template following the lines you've just drawn. *Use a cutting board or work surface of some sort when cutting the template to keep from damaging your desk or table top.*



Remove the excess pieces, and now you've got a "T" shape that looks like this....



Trim a small 1/8" square of the white temporary adhesive, and apply it to the top of the template as shown. This will help hold it lightly in place, and allow it to be easily removed once the pickups have been placed.



Place the template against the bridgeplate inside the guitar with the drawn saddle line and string position dots facing up (you should be able to see the string position dots while looking in the bridge pin holes). Then insert the tees, dowels, etc. into the two outside bridge pin holes to secure the cardboard template properly.



Using this template, you can easily, quickly and accurately place the pickups inside the guitar just by feel. Apply a fresh strip of the temporary white adhesive to the red sensing surface of each of the pickups as directed above. Feel for the template edges of the “T” shape with your fingertips while holding the pickup just above the bridgeplate. Place the long side of the pickup flat against the long flat edge of the template, and slide it into the appropriate corner. Once it’s correctly located, press the pickup securely into place.



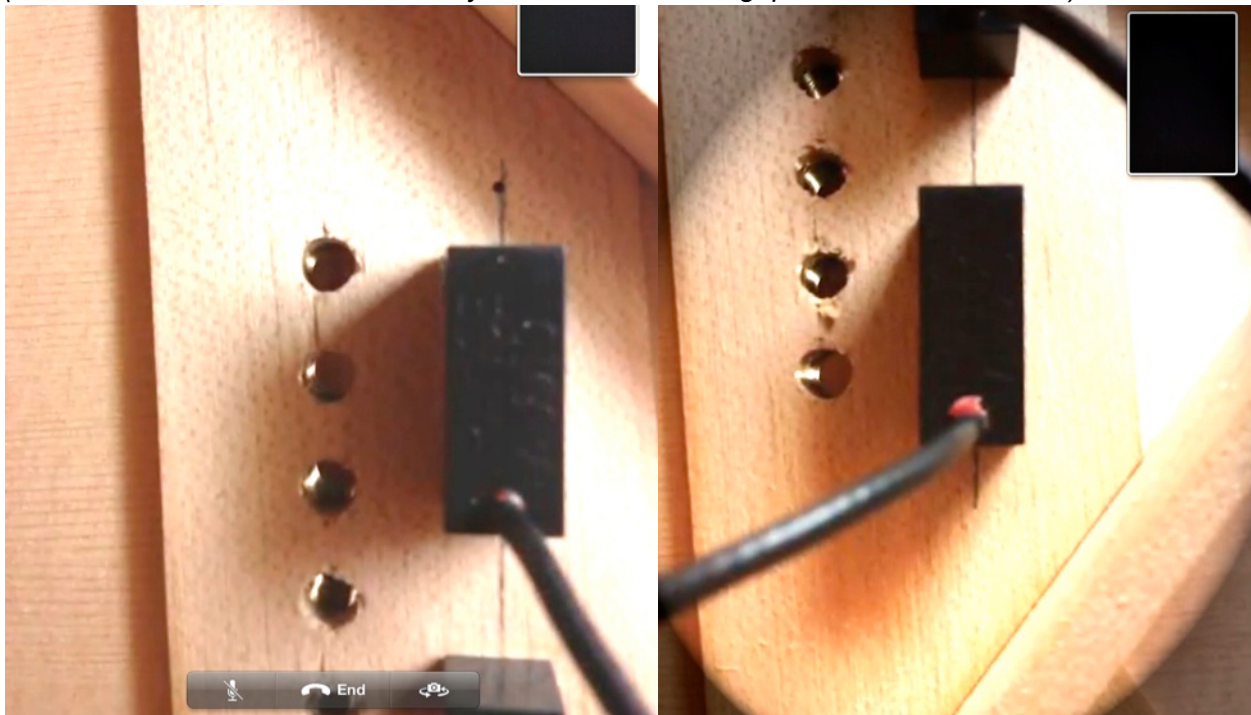
*(in-guitar technique shown above on a demo guitar body)*



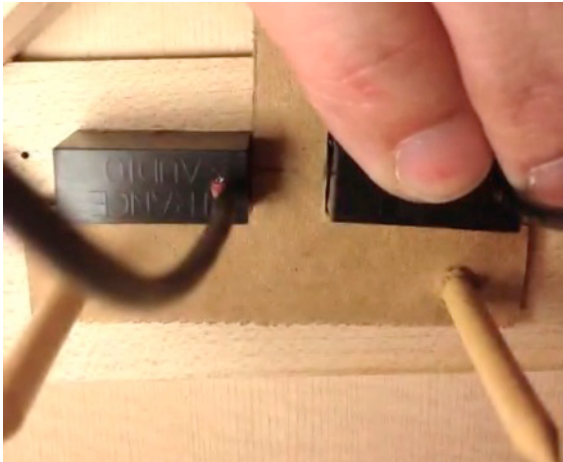
For the treble side pickup, the back edge of the pickup presses into the corner of the template, and for the bass side pickup the front edge. This photo shows what the pickups look like when properly positioned in the template; *in this view inside the guitar, the soundhole is at the top of the photo, so the treble pickup is shown on the left side, and the bass pickup is on the right*. With just a bit of practice, you will be able to place the pickups in the proper locations by feel alone, and with great accuracy.

*(But if you would like to see inside your guitar, you can use a small mirror and flashlight to take a look, or use an iPad™ and iPhone™ (or 2 iPhones) and use FaceTime™ to get a view like the ones we show here!)*

These pictures show how well the pickups line up on the saddle line using the template method. *(The saddle line has been accurately marked on this bridgeplate for our reference.)*



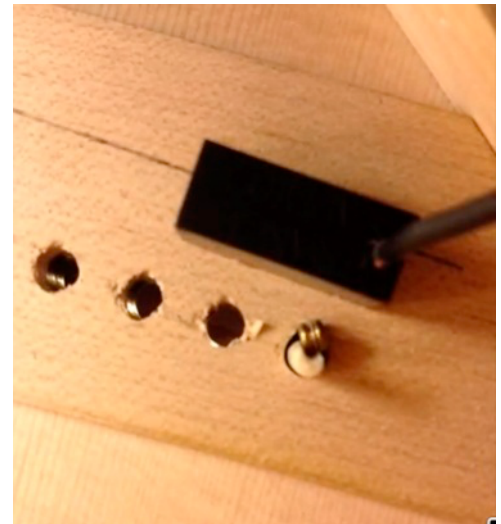
**We recommend that you install one pickup at a time**, using the turnbuckle pickup clamp to secure it against the bridgeplate properly. For tone and string balance evaluation with the white temporary tape, letting the tape bond with the clamp for 5 minutes should be plenty. For the final installation with the red permanent adhesive, let each pickup bond overnight (8-12 hours). This will insure a good bond to the bridgeplate, providing maximum output and low end response. *Refer to the pickup clamp information that follows to familiarize yourself with the proper use.*



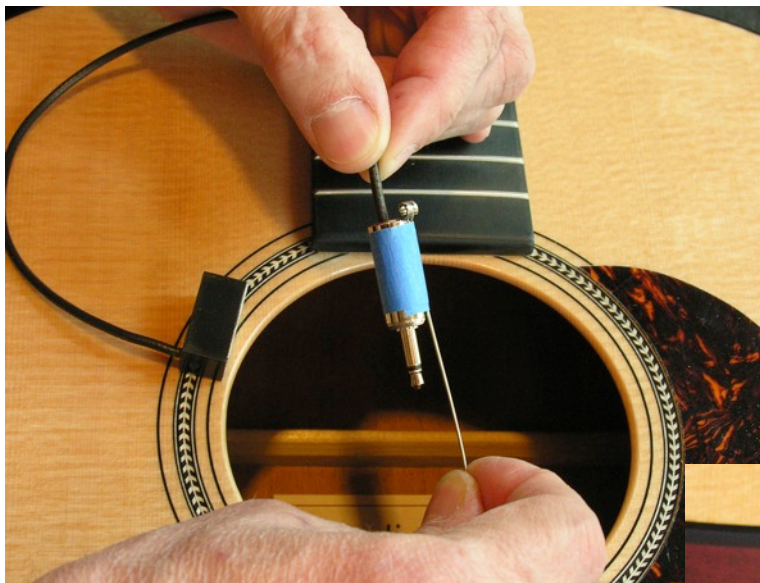
The pickup locations shown in this guide have been derived from years of experience installing these transducers, and reflect the typical final positions achieved in about 90% of the guitars we've worked with over the years. We recommend initially installing in the positions shown, then evaluating to see if any adjustments are needed. The template installation method makes moving the pickup locations quick, easy, accurate and repeatable so you can experiment to fine tune your preferences.

Placement determines the tone and string balance of the pickup. The tone is brightest and loudest when the transducer is located directly on the saddle line. Moving it towards the sound hole will mellow the tone, adding more body resonance, and less direct string sound. Moving the pickup more towards the bridgepins (if there is sufficient room; some guitars have very little distance between the bridgepins and saddle) can sometimes produce a more focused sound. If you install the transducers closer to the bridgepins, we recommend that you install the ball end of an old low E or A string that's been cut off to a few inch length to serve as a guide to let you pick an install location that won't let the pickups crowd the ball ends of the strings when they're all installed. The low E and A string ball ends are usually the closest to the saddle on most guitars, so install the string stub in these locations after locating the pickup to see if you have enough room available.

Moving the pickup parallel along the saddle line will determine the string balance. Each transducer primarily handles a group of three strings; the bass side transducer is responsible for the low E, A and D strings, while the treble side transducer handles the high E, B and G strings (there is also a certain amount of bleed or crosstalk across the saddle from the other strings for each pickup). Moving the pickup towards a weak string will increase its volume; find a position for each pickup where the two outside strings of each three-string group are balanced in volume.



**Once you've installed both pickups,** remove the template by removing the tees and pulling down gently on it to pull the small adhesive square loose. Replace the saddle (if removed) restring and tune, and plug in to play and take a listen to your handiwork! *Hint: If you decide to experiment with other placements of the pickups, you'll find that it will be very helpful to record each change you make so that you can easily compare the before and after results. If you have a multi-track recording setup, try capturing a short performance on a mono track playing each of the strings and a few favorite licks or repeated chords each time you make a new install. This will let you quickly and repeatably audition the changes you make, and allow you to more clearly hear any differences by switching between the tracks as the recording is playing. Be sure to save and label the templates so you'll know which one relates to which track of your recording.*

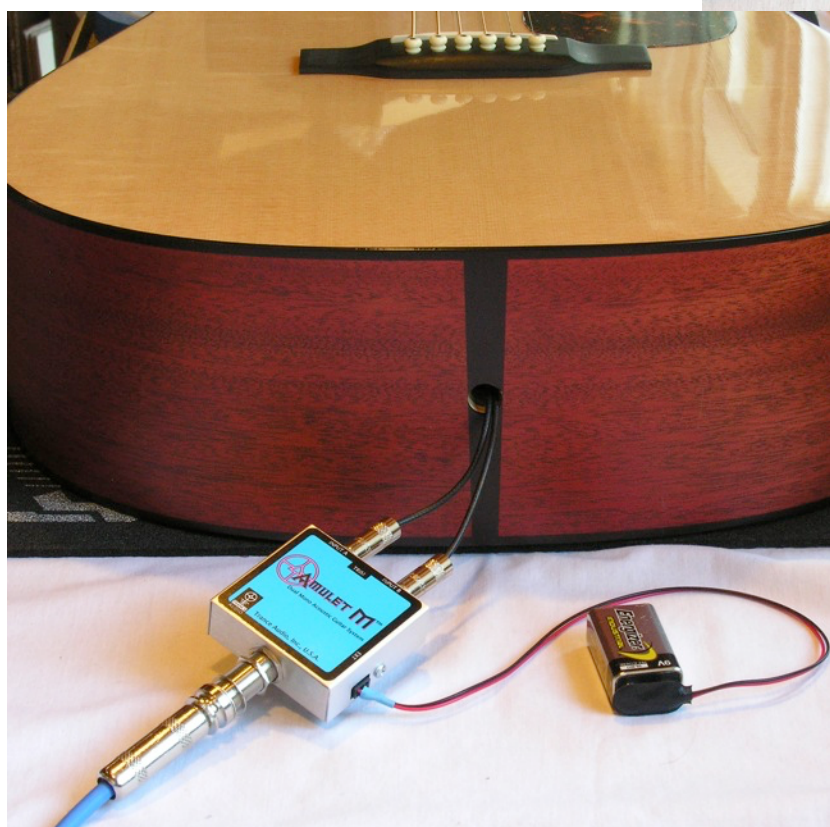
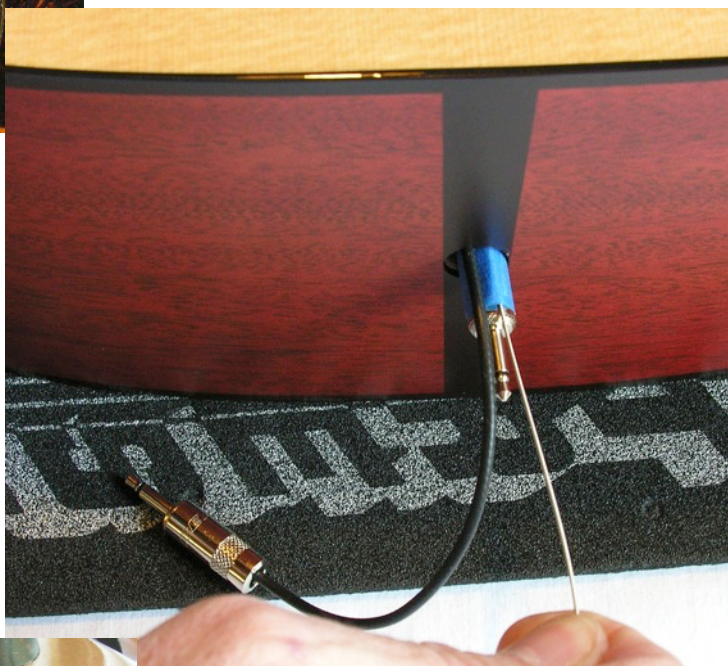


**If you're installing an Amulet M series**

**system:** The Amulet M pickup cables are long enough to go out through the endpin jack hole of the guitar and plug into the preamp, which makes it easy to work on the system during installation.

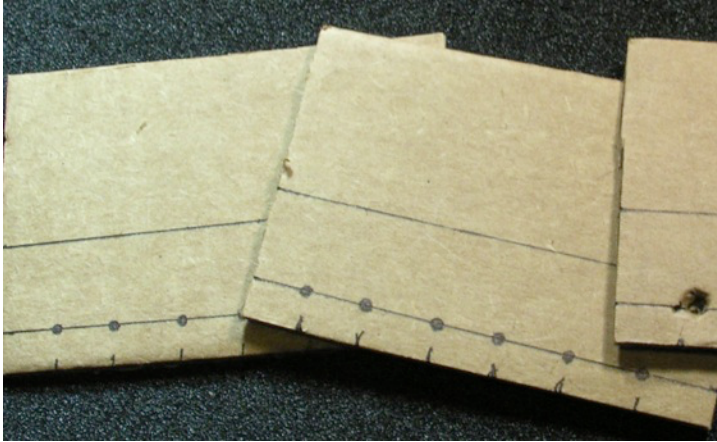
You can tape the pickup plugs to a piece of stiff wire (an old guitar string works well for this) fed into the guitar through the endpin hole to the soundhole, and pull them back through to get them outside to the preamp.

That way, you can easily plug in the pickups to compare the string balance for each pickup individually, as well as combined together. *Remember that the trim control on the M preamp adjusts the volume of whatever transducer is plugged into input A, allowing you to set the overall balance between the two pickup and string groups. This allows you complete control of the finished sound and balance of your instrument.*



Although both transducers and both channels of the preamp are identical, it can be very useful to you to mark one of the pickups, so you know which pickup is plugged into channel A, which is volume adjustable via the trim control. You can put a piece of masking tape on the black body of the pickup and wrap a small piece around the barrel of the connector on the end of the cable. If you make this the bass side pickup for the install, and plug the connector into the channel A input on the preamp, then you'll know that when you are adjusting the preamp trim control to fine tune the balance between the two pickups, you're adjusting the volume of the bass pickup. This can help avoid any confusion later on.

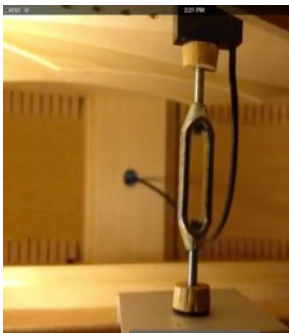
**If you want to make changes or adjustments**, just create a new template from one of the copies you



made previously of the original blank and incorporate the desired changes. You'll find that volume and tone changes occur somewhat gradually as you move positions on the bridgeplate, rather than quickly and abruptly. Typical adjustments usually involve moving the pickup between 1/16" to 1/8" as you fine tune your efforts to balance the strings. Using this method to place the transducers makes it easy to quickly relocate them and fine tune the positioning that works **for you.**

Replace the temporary adhesive on the transducers with each installation or relocation to insure that the bond is secure (although you can remove and replace the pickup 2 or 3 times after gentle placement before the temporary tape's bonding ability degrades) and *be sure to clean and prepare the bridgeplate again if any residue from the previous adhesive is left behind.*

**Once you have found an appropriate mounting spot with the temporary adhesive**, firmly reapply the pickup with an adhesive strip of our new permanent tape adhesive (red backing) . This tape is good for a one-time only stick, it can't be successfully removed and relocated without ruining it. It's very thin, and makes a great bond with a clean surface. You must remove any glue left behind from before, and the surface should be freshly prepared by lightly sanding with 100 grit sandpaper on a small sanding block, then cleaned with a lightly moistened cloth and allowed to dry thoroughly. Like the other tape, the pieces are larger than the pickup; apply (try not to touch and get finger oils on the actual bonding surface), rub the entire surface firmly with your thumb to bond it to the pickup, and trim the excess with good sharp scissors or the X-Acto™ knife on a flat cutting surface. A cotton swab (i.e.: Q-Tip™) dipped in acetone will help remove any residue from the pickup if you need to start over, and a cloth lightly moistened with acetone will help remove any stubborn adhesive left behind on the bridgeplate. Acetone can also be used to clean any residue from the scissors blades to insure that they can cleanly trim the excess from the pickups, but remember to use it sparingly, and don't get it on the finish of your instrument.



Remove the red plastic backing using an X-Acto type blade at a corner, and peeling it off. The red backing sticks pretty well and takes a bit of work to cleanly remove it. Once the backing is removed, carefully place the pickup in the spot that you've defined with the template, and press firmly into place. After a successful placement, put medium pressure on the pickup using a pickup or soundhole clamp for 8-12 hours. This is crucial for the pickups to securely bond. You'll still be able to remove the pickup later by applying steady pressure to the side until the bond comes loose, but it will stay stuck on its own until you wish to remove it. We have enclosed enough tape for several installs.

\*Special thanks to Rich Eckhart and Dave Strunk of Brothers Music Shop, and to Denny Rauen of Rauen Guitars for their invaluable help and inspiration in developing this installation procedure\*

## The Pickup Clamp

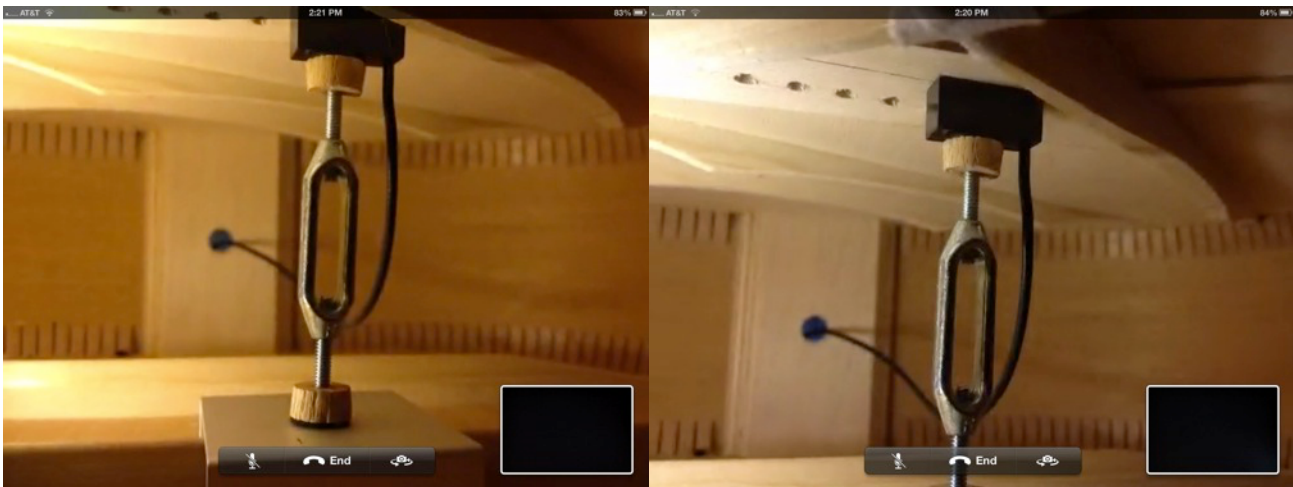
The new red permanent adhesive used to install the Acoustic Lens works best if the pickup is clamped under pressure after placement in the desired location on the instrument bridgeplate. Our pickup clamp is a useful tool to easily accomplish this and get the best performance from your installation.

Adjusting the size of the clamp by rotating the turnbuckle will allow you to place it in position to apply pressure to the pickup by pressing between it and the back of the instrument. The rubber foam pads on each end of the clamp will grip and help to hold it in place and allow for easier positioning of the clamp before you begin to tighten it.

*Note: If you're installing an Amulet M system - The Amulet M pickup cables are long enough to go out through the endpin jack hole of the guitar and plug into the preamp externally (as you can see in the photos below), which makes it easy to work on the system during installation. You can tape the pickup plugs to a piece of stiff wire (an old guitar string works well for this) fed into the guitar through the endpin hole to the soundhole, and pull them back though to get them outside to the preamp. If one of the back braces is in the way, you can remove the top cover from the preamp and place it over the brace to make a nice flat surface to press against. Keep in mind that with the top removed from the preamp, you will pick up a bit of hum and buzz which will go away when the top is attached to the preamp again after installation.*



It's useful to listen to the pickup through headphones when you apply the clamp with the low E and A string strung up for the low pickup, and the high E and B string strung up for the high pickup. When the clamp is properly applied and tightened, you'll hear the volume and bass response excessively increased because of the direct pressure being applied to the pickup. When the clamp is pushing straight up and down against the pickup and the back of the instrument, the volume and tone will increase the most. **Don't overdo it; you'll find that it doesn't take much pressure to get optimal results.** Once properly clamped, let the pickup bond to the bridgeplate overnight (12 hours or so). When you slowly remove the clamp, the volume and tone will drop to normal levels, and the pickup will be ready to use.



*Above: the pickup clamp in action inside a guitar. (Amazing what you can do with an iPhone and iPad!)*