

Mojotone PAF Humbucker Kit Instructions

## Before you get started consider....

#### Number of turns

Original Gibson PAF's had an average of 5000 turns of #42AWG Plain Enamel wire per coil, however they tended to vary greatly from one to the next. That said, feel free to overwind or underwind to your liking using 5000 turns as a good starting point. More turns increases output, mids, and bass, and decreases treble.

#### Winding Pattern and Tension

All PAF's were machine wound with fairly even turns per layer. Tension needs to be so that the coil is tight, but not so tight as to stretch the wire or flare the bobbin. Too loose or too much scatter, and the coil will become fatter limiting the amount of wire you can wind, and will also become more prone to microphonic feedback. Practice is the only way to get it right!

#### Winding Direction and Polarity

Most PAF's were wound clockwise for both coils with North polarity on the slug side and South on the screw side. All that matters is choosing the same winding direction and polarity for every pickup you make. Otherwise you will have issues with pickups being out of phase with each other.

#### Wax Potting

Original PAF's were never wax potted which is why they tend to be more microphonic and airy sounding. Consider wax potting with Paraffin wax if you end up with a pickup that is too microphonic.

# Instructions

## Step 1:

Using your Mojotone winding machine, program your desired number of turns and winding direction. Save the settings if you want to use them again in the future.



#### Step 2:

Cut the 28AWG black pvc lead wire into 4 equal pcs at about 3" each. Then strip one end about ¼". You can burn the insulation with your soldering iron tip to strip the ends if you don't have wire strippers. Just be sure to clean soldering iron tip immediately afterwards!



#### Step 3:

Set the spool of coil wire in a smooth edged bucket on the floor (preferably between your feet) and put a weight on top of the spool to secure it into place. The wire needs to feed off of one end of the spool without getting caught on anything so make sure it has a clear path from the spool to your hand.



#### Step 4:

Feed the coil wire through your hand guided tensioner first if you don't want to wind just using your fingers as a guide. Set the tension by tightening the felts until the wire has resistance when pulling. Set the tensioner in front of the winder with excess coil wire coming through the tip.



## Step 5:

Wrap the coil wire around the stripped end of the 28AWG lead wire and solder it together.

If you are using plain enamel insulated wire, you will need to carefully draw the wire between a folded piece of 600-800 grit sandpaper until about 1" of the insulation on the end is removed before it will take solder.



This takes practice and skill! If you are a beginner we recommend using solderable poly insulated wire.

## Step 6:

Feed the other end of the PVC lead wire through the bottom square of the bobbin and tape the opposite end soldered to the coil to the inside wall of the bobbin using a 1" piece of ¼" paper tape. This is the lead wire that will be the start of your coil so be sure to feed the coil wire off in the direction of your wind.



#### Step 7:

Load the bobbin onto the winder mounting jig with the bottom of the bobbin towards the machine. Secure the bobbin flat into place and make sure the PVC lead wire coming through the bottom of the bobbin is taped securely out of the way before winding.





#### Step 8:

Setup your traverse winding parameter to the proper width of the inside bobbin width using a straight edge. We recommend setting the winding parameter about .015" in from each end of the inside flange of the bobbin.



## Step 9:

Holding your hand guided tensioner into position, turn the winder spindle 2-3 turns by hand in the direction you setup until the wire has tension from the tensioner to the bobbin. Starting the winder with the coil wire loose will result in breaking the wire more easily.



## Step 10:

With the winder speed control on 0, press the "Run" button to start the machine.

Gradually turn the speed control up to where you are comfortable winding until the machine stops at the programmed number of turns. Try to feed the wire slowly back and forth while watching to build the coil as evenly as possible.



You can slow the speed down to 0 and check your coil build on the bobbin throughout the winding process. A white backer board helps see things better too.

## Step 11:

After the bobbin is wound, use a 1" piece of ¼" paper tape to hold the end of the coil wire to the outside of the coil. Then cut the coil wire end leaving at least 3" to work with.



#### Step 12:

Repeating Step 5, solder the end of the coil from the bobbin to another 3" piece of PVC lead wire and tape it to the outside of the coil so that it comes off the same end as the start lead of the coil.

You can roll the excess coil wire onto the lead wire before taping.



## Step 13:

Wrap the coil 3-4 times with ¼" paper tape while keeping the coil lead wire coming through the bottom of the same end. This is the end of the bobbin with the square cutout.



#### Step 14:

Repeat Steps 5-13 for the other bobbin. Once both bobbins are both wound and taped with leads, you can press your slugs into the slug side bobbin so they are flush with the top.

It's easiest to press or tap them in from the bottom with the top against a flat surface.



## Step 15:

Push back one end of the 22AWG external braid to expose about 1.5" of the internal black cloth covered lead.

Feed the other end through the corner hole of the humbucker frame until the braided portion stops at the end of the bent inside ledge of the frame.



The 1.5" exposed cloth lead will

extend beyond that point off of the end of the frame. Solder the external braid against the inside ledge of the frame being careful not to flow solder towards the pole piece holes. An alligator clip is helpful for holding the wire in place while soldering.

# Step 16:

Put both bobbins face down and side by side on a flat table with the slug coil on the left and the screw coil on the right. Make sure the coil leads are facing the same direction away from you on the table.

# Step 17:

Lay the magnet between the bobbins (south towards the screw side, north towards the slug side) with the 10 hole keeper bar against the south side of the magnet.

Place the maple spacer on the other side of the slugs (far left side).

Make sure everything is aligned



and centered with the keeper bar holes centered over the pole piece holes of the screw side bobbin.

#### Step 18:

With the bobbins still face down and pre-assembled with magnet, keeper bar, and spacer, you can now install the humbucker frame to the bobbins using the 4 brass screws to fasten it into place.

This will hold the magnet, keeper bar and maple spacer tightly between the baseplate and bobbins.



Make sure the pole piece side of the frame is on the right with the cloth covered lead coming off of the same end as the 4 PVC coil lead wires.

## Step 19:

Cut the 4 PVC Lead wires down to the same length as the cloth lead wire from the baseplate so that all of the wires are equal length off of the end.

Then you can strip the PVC leads ¼" and push back the cloth lead to expose ¼" of the stranded wire.



## Step 20:

Twist and solder the 2 PVC lead wires from the finish of each coil together.



Tape the end and tuck them into the end or between the bobbins where you have space.



Make sure the solder joint of the 2 joined wires are taped well enough as to not touch anything metal and ground out the pickup.



#### Step 21:

Solder the start coil lead wire coming through the bottom of the screw side bobbin to the inside corner of the baseplate for ground. Be careful not to burn the pickup bobbins with the soldering iron.

Use a small alligator clip to hold the wire in place for soldering if you need to.



#### Step 22:

Solder the start coil lead wire coming through the bottom of the slug side bobbin to the end of the cloth covered lead from the baseplate and tape the end.



Again, make sure the soldered end is taped well enough as to not ground out against anything metal.



Tuck them across the end of the baseplate between the bottom of the bobbins and the inside of the frame.



#### Step 23:

Using the wider  $\frac{1}{2}$ " paper tape, tape the end where the lead wires are tucked about  $\frac{1}{2}$  way around the pickup.

Be careful not to extend the tape over where you might solder a cover to the frame later.



#### Step 24:

Using a 5-40 tap, tap the pole piece holes through the screw side bobbin and the baseplate. Forcing the screws in without tapping the thread first will result in damaging the screw and pickup.



Install the pole pieces using a flathead screwdriver being careful not to slip or cross thread the screw.





# Step 25:

Now you are ready to test the DCR with a multimeter and install the pickup! Hope you enjoy!

