

duncan | turner acoustic research

Perfect Timbre™ DPU-3 Acoustic Pickup System

Installation Instructions

Congratulations! You have just purchased one of the best sounding acoustic guitar pickups that money can buy. This pickup is the result of extensive testing and development to craft a sound board pickup system that would preserve the natural timbre and warmth of your acoustic guitar.

Our pickup system has three major elements: the end-pin jack; the revolutionary PT Sensor; and the preamplifier. We will cover operation and installation in some detail.

We recommend that the installation be performed by a qualified luthier. They have the proper tools and experience to get the job done right the first time. Your D-TAR dealer is the place to start for advice and installation. If you wish to perform the installation yourself, please read and follow these instructions carefully. It's not difficult, but good mechanical skills and reasonable care are required.

INSTALLATION STEPS

- 1) Determine sensor location.
- 2) Mount the end-pin jack.
- 3) Mount the sensor.
- 4) Mount the preamplifier.
- 5) Final connections.
- 6) Restring the guitar and shape the tone.

ground and "H" for hot. Solder the wires from the secondary pickup to the appropriate pads and if possible, secure the cable jacket to the PCB with a drop of super glue. Replace the back shield checking that the ground wire is still intact.

2) Disconnect the wire jumper on the top side of the PCB labeled JP1. (refer to Figure 3)

3) Referring again to Figure 3, find J3. You will use this connector to hook up your blend pot. For the cleanest installation, we recommend using a .100 spaced housing to plug into J3, but if you are careful, you can solder directly to the pins.

The pin assignment is as follows:

- pin 1 - auxiliary output
- pin 2 - blended output
- pin 3 - ground
- pin 4 - DPU-3 output

Figure 3

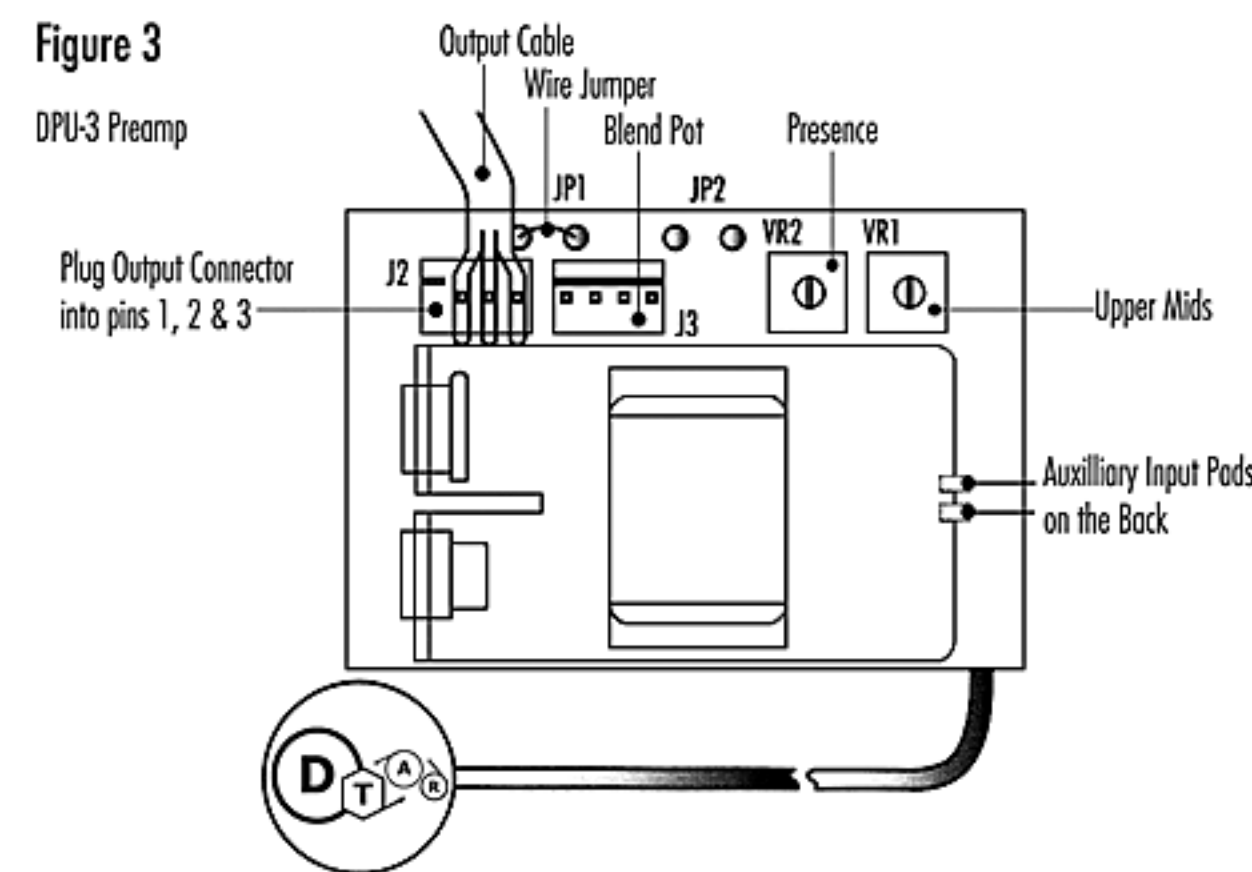
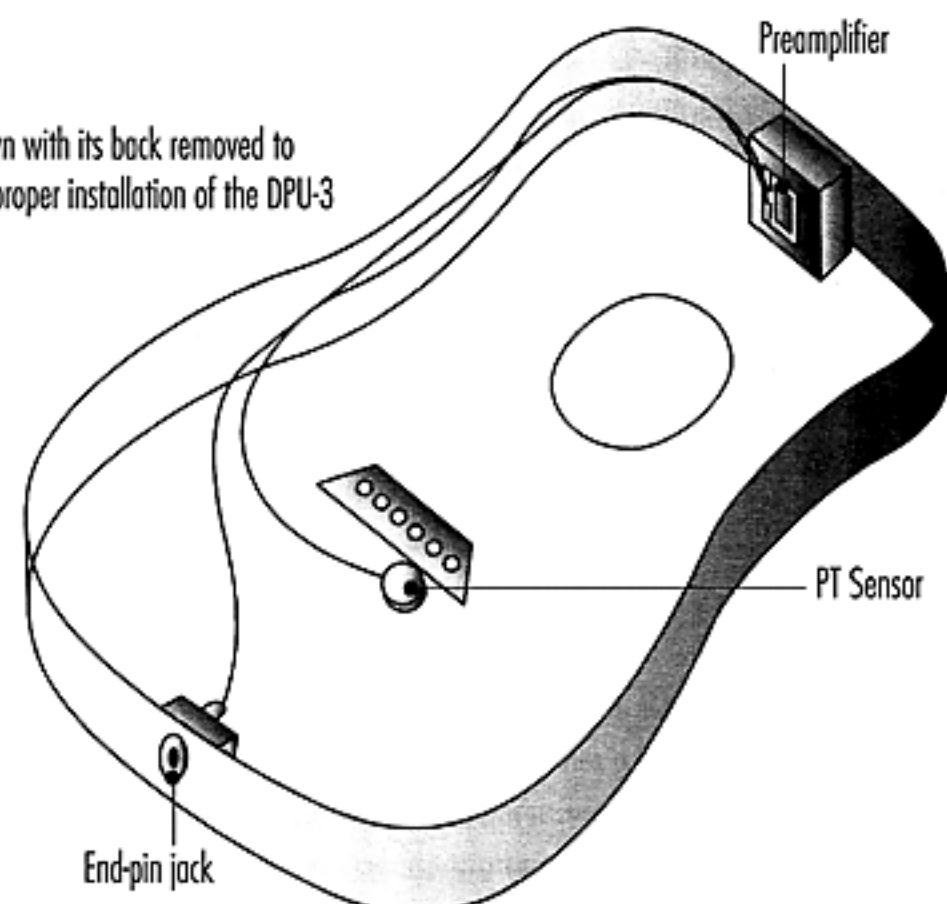


Figure 1

Guitar is shown with its back removed to illustrate the proper installation of the DPU-3



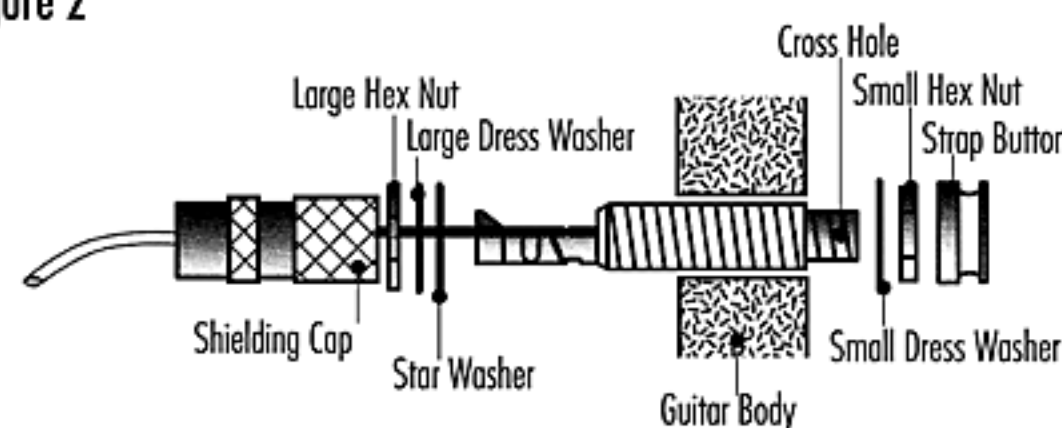
THE END-PIN JACK

We have included an end-pin jack with our pickup system that we feel is among the very best available. It will not loosen up, installs simply, and is of top quality mechanically and electrically.

Installation (refer to Figure 2)

- 1) Remove the existing end-pin CAREFULLY drill out or ream the hole to 15/32". Proper equipment and know-how will keep the finish intact, but this step is best done by qualified repair person.
- 2) Unscrew the threaded strap attachment and the small hex nut. Remove the thin washer.
- 3) Slide the serrated lock washer and the thick washer onto the body of the jack, thread the large hex nut onto the shaft 4 or 5 turns. Then poke the jack through the hole in the rear block. The large part of the jack should be just below the surface of the guitar. Adjust the position of the large hex nut as necessary to achieve this alignment.
- 4) Screw the knurled shield cap over the connections, poke the jack through the end-pin hole for the final time, place the thin washer over

Figure 2



the protruding shaft, and thread the small hex nut over the shaft until it's finger tight. Tighten the nut securely. You can put an Allen wrench through the small cross hole to keep the jack from spinning.

5) When the jack is secured, install the threaded strap attachment and tighten it firmly.

THE SENSOR

The sensor is a low mass proprietary design accelerometer with outstanding sensitivity and linearity from 10Hz to beyond 30Hz. It responds to every audible nuance of your guitar's top with incredible accuracy and fidelity.

How to find the "Sweet Spot"

It is best to experiment with the location of the PT sensor on the outside of your guitar's top before doing the permanent installation on the inside. Use regular thin scotch-type double-sided tape (not foam double-sided tape) to stick the PT sensor directly on the sound board. Good starting points are behind, or sometimes directly in front of the bridge, between the D and G strings. When you find the right spot on the outside, it's usually easy to mount the sensor close to the same spot on the inside.

Installation

Several glue types have been used for final installation, each with its own benefits. Basically, any good, void filling, shock resistant glue will work. We have had good results with the thicker varieties of cyanoacrylate (gel type super glues). When properly installed, they give the most efficient transmission of vibration from the sound board to the

sensor. They also provide a very secure mounting.

A second adhesive type, silicone RTV, has also been used successfully, and is actually preferred by some for its sonic characteristics. Here it is important to use a minimal amount and, using a deep throated clamp, carefully clamp the sensor to the sound board firmly enough to force out all but a very thin later of adhesive. A thick glue joint will tend to decouple the sensor and cause a loss of response at high frequencies. Clamping is advised, but not essential when using fast setting cyanoacrylate glues. With either glue, it is important to refer to the manufacturer's directions for proper curing times, and allow the glue to cure fully before attempting further work on the guitar.

THE PREAMPLIFIER

This is the brain of the Perfect Timber system. The preamplifier performs the dual roles of impedance buffering and response shaping. It also has two "tweak" potentiometers on the board to fine tune upper mid-range (VR1) and presence (VR2) response to individual tastes. Finger noise can be moderated, or pick attack and high harmonics can be emphasized by adjusting these pots after installation. Adjustment can be done with a small, flat screwdriver.

Location

The preferred location for installation is on the neck block of the instrument (see Figure 1). Other suitable locations are on the back or sides. Do not use the sound of the board for mounting the preamplifier.

Installation

The preamplifier may be mounted using Velcro® supplied with the system. Care should be taken to thoroughly clean the mounting surface with tape or cloth. A thin coat of shellac should then be applied to the mounting surface to seal the wood grain. When the shellac is dry, peel off the paper backing, and press one half of the Velcro firmly into place. Use of Velcro allows the circuit board to be removed for easier battery charges, but for a more permanent installation, double stick foam tape can be used.

Battery

We recommend the use of a high quality alkaline battery to power the unit. Plugging in the guitar cable turns on the unit. Current drain is quite low, so operating life should be at least one year as long as the cable is

removed from the end-pin jack when the guitar is not in use. Replacing the battery is as simple as it looks, although the battery clip has a death grip on the battery, so a little force and nimble fingers are necessary. Be careful to observe proper battery polarity.

FINAL CONNECTIONS

Attach the cable clamps to the back or sides (see Figure 1). A spot of Super glue on the cable clamps will help to keep them in place. Route cables neatly out of sight and plug the cable from the end-pin jack into the proper location on the preamplifier (see Figure 3). There is a cable tie included in the installation kit which can be used to bundle any excess cable.

Install a fresh battery, string and tune your guitar. Plug in a good quality sound system, an acoustic guitar amplifier, or even your home stereo. Adjust the volume on your amp to a comfortable listening level and adjust VR1 and VR2 to taste. VR1 adjusts the upper mid-range. Pick attack, articulation and finger noise can be modified with this control in conjunction with VR2, which is a 6dB per octave treble roll-off, operating from 2KHz to 20KHz. Sound system capabilities and playing preferences will determine the optimum settings. They are factory set at the midpoint in their range, which is a good starting point in most cases.

Advanced Features - Blending

The Perfect Timbre has some special features that have been added based on input from our customers, the first of which is blending capability.

There is now a high impedance, unity gain, auxiliary input that allows blending with a second signal source such as our under the saddle Timber-Line™. We will shortly be offering a kit that allows easy utilization of this feature, but for those of you that can't wait, here is an outline of the installation procedure:

- 1) The auxiliary input is located inside the sandwich formed by the main PCB and the back shield. The four plastic screws and standoffs must be removed to access the input. Be careful not to break off the ground wire running to the back shield. If you do, the connection will have to be reestablished to maintain quietest operation. Once inside, you will notice two square solder pads next to the sensor input, labeled "G" for

Figure 4a

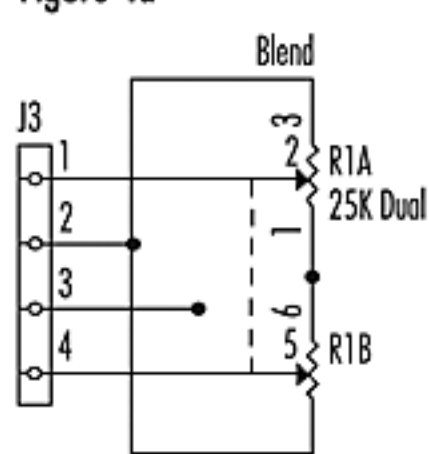
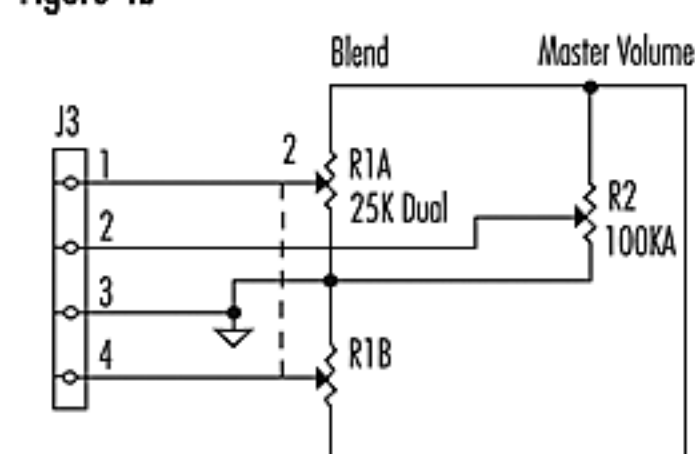


Figure 4b



4) It will be necessary to fabricate some type of mounting plate that will hold the blend pot. We recommend attaching it inside the guitar around the edge of the sound hole using Velcro®. The optimum value for the blend pot is a 25K dual, but values up to 100K will work. We prefer the use of slider pots for this application because it is easier to fasten them to a flat mounting plate with super glue, but a rotary can be used as well. Single sided copper clad FR-4 (fiberglass) works well as a mounting plate material. Make sure to ground the copper plating. Refer to Figure 4a for a proper hook up of a blend pot.

5) If you are feeling especially resourceful, it is possible to add a master volume at the same time you are adding the blend pot. The value should be around 100K. Your mounting plate will have to be designed to accommodate both pots while still allowing easy access to them. Refer to Figure 4b for the wiring.

Advanced Features - Phase Reverse

The second advanced feature that the Perfect Timbre is capable of is phase reversal. It is only available if you are NOT using the blending function. This feature is useful for helping to eliminate feedback by inverting the phase of either sound board or body resonance relative to the speaker system. This can help prevent the kind of runaway feedback that often feels like it will detach to the top of your instrument for its braces.

Again, we plan to release a kit to make implementation easy, but for those of you so inclined, here's an outline of the procedure:

Figure 5a

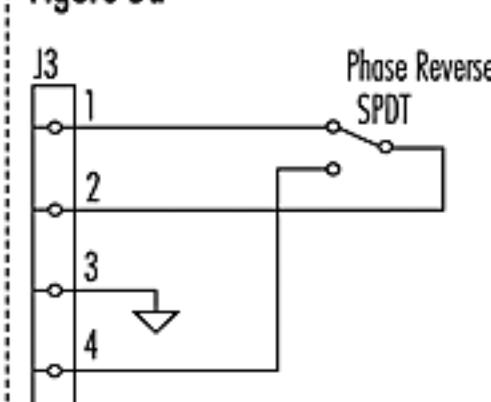
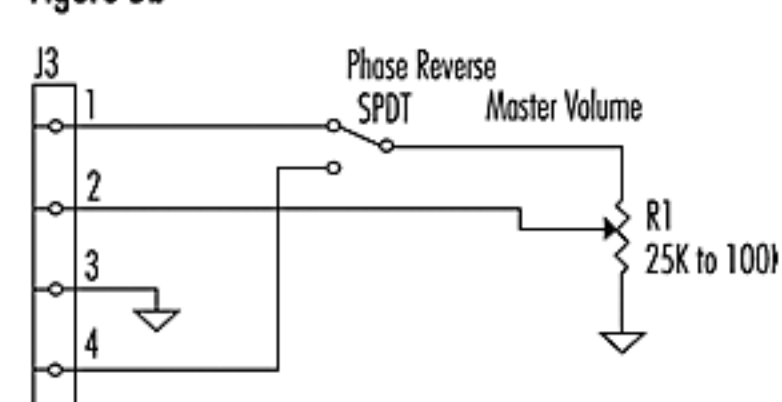


Figure 5b



1) Disconnect the wire jumper on the top side of the PCB labeled JP1 (refer to Figure 3).

2) Add a wire jumper between the pads labeled JP2.

3) Refer again to Figure 2, find J3. You will use this connector to hook up your blend pot. For the cleanest installation, we recommend using a .100 spaced housing to plug into J3, but if you are careful, you can solder directly to the pins.

The pin assignment is as follows:

- pin 1 - inverted Perfect Timbre output
- pin 2 - final output / input back into PCB
- pin 3 - ground
- pin 4 - non inverted Perfect Timbre output

4) It will be necessary to fabricate some type of mounting plate that will hold the reverse switch. Follow the same material and mounting guidelines mentioned in step 4 of Advanced Features Blending. The switch should be a SPDT on/on, but a DPDT will also work. Refer to Figure 5a for a proper switch hook-up.

5) Again, for the brave hearts out there, it is possible to add a master volume at this time. As before, your mounting plate will have to be designed to accommodate the added pot. The pot value at this time can be as low as 25K or as high as 100K. Refer to Figure 5b for proper wiring.

TROUBLESHOOTING

You just plugged into our buddy's guitar amplifier and the guitar feeds back like crazy:

Acoustic guitar and electric guitar have totally different amplification needs. Ever tried plugging a microphone into a guitar amp and trying to use it as a PA? Same kind of problem. If you regularly need to play through a guitar amp, you might consider investigating in an EQ or other feedback controlling device such as our Equinox parametric EQ with notch filter. You can also try activating the phase reverse feature.

Your guitar sounds distorted.

Check the gain settings on your sound system or amp. Try a different channel. Check your cables. Replace your battery. Listen to the guitar acoustically to see if something is physically rattling. Have your dealer check it out or call the factory for assistance.

Unit doesn't work at all.

If you did the installation yourself, check your work. Install a fresh battery and check your shorted cables. Check for proper orientation of the connector at J2 (see Figure 3). See your dealer or call the factory.

You need to play very loud, but your guitar feeds back.

The natural, wholesome things that make an acoustic instrument sound warm, rich and mellow also react violently to a high degree of amplification. Although our pickup will play louder than a microphone, at some point you'll need to notch out the sound board and air cavity resonance in order to play very loud. A good graphic, or better yet parametric EQ, such as Equinox, will help with the feedback. You can also try activating the phase reverse feature.

You move around a lot during your performance. Feedback seems to come and go as you move.

When your guitar is a certain distance from the speaker, the sound waves from the speaker are "in-phase" with the motion of the sound board, or with the vibrating air in the guitar's body. Sometimes this "sympathetic vibration" gets carried away and feedback occurs. Once again, EQ will help eliminate the feedback. Trying to mark spots on the stage that are "safe" during sound check doesn't hurt either. A HELPFUL HINT - At a resonant frequency of 200Hz (an acoustic guitar's typical dominant frequency) there will be a feedback canceling "node" every 5.6 feet. Halfway between the two nodes, your guitar may feedback like crazy if you're not careful.

CONCLUSION

We hope that you enjoy your new Perfect Timbre. The natural sound of an acoustic guitar is an enjoyable and thriving part of our musical tradition. Thank you for selecting our product to complement your instrument. Let us know if you have any questions or suggestions. We'd love to hear from you.

LIMITED WARRANTY

D-TAR offers the original purchaser a one-year limited warranty on both labor and materials starting from the day this product is purchased from an Authorized D-TAR Dealer or as original equipment in an instrument, provided that a qualified, professional repairperson or luthier performed the installation. D-TAR will repair or replace this product, at its option, if it fails due to faulty workmanship or materials during this period. Defective products should be returned to your USA dealer, international distributor, or sent direct to our postage prepaid along with dated proof of purchase (e.g., original store receipt) and a RMA number clearly written on the outside of the box. Please call our factory for issuance of an RMA number.

This warranty does not apply to damage to this product or an instrument caused by misuse, mishandling, accident, abuse, alteration, faulty installation or installation by a non-qualified repairperson. Product appearance and normal wear and tear (worn pain, scratches, etc.) are not covered by this warranty. D-TAR reserves the right to be the sole arbiter as to the misuse or abuse of this product. D-TAR assumes no liability for any incidental or consequential damages, which may result from the failure of this product. Any warranties implied in fact or by law are limited to the duration of this express limited warranty.

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