

Field Guide to Replacing OEM Subwoofer

How I Replaced the Factory Subwoofer in my 2019 Audi S5 Sportback¹

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This paper describes in as much detail as possible the methods by which I removed and replaced the factory subwoofer in my 2019 Audi S5 Sportback (with B&O audio). Each step of the way was informed by Bruce Miranda, who I thank for his support, advice, and patience.

I. Things to Decide

A. Are you keeping the OEM subwoofer?

I did not. The sub/amp combo I installed is vastly superior to the OEM sub. I suppose someone may argue that having more speakers in general gives more options, but I prefer simplicity. Moreover, if you have both in place, you may find them competing with each other in undesired ways. You'll be able to control the Kicker Key amp, but you won't have any control over the OEM sub. Bottom line, I'm 100% thrilled with the improvement; I do not miss the OEM sub.

Note also, though, that if you are keeping the OEM sub, you have a larger choice of amplifiers than the one I use here. In that event, the OEM subwoofer keeps the B&O amplifier appropriately loaded. If you take it out, you need an amp or a LOC that has the appropriate load resistance to keep the B&O amp happy. The Kicker Key amp used here was known to work, and that's why it was my choice.

¹ This is my account, published for your interest and information. If you choose to follow this guide, you do so at your own risk. There are no promises, guarantees, or warranties.

B. Where to mount your amplifier?

I mounted mine on the floor of the well in the trunk where the OEM subwoofer sits, just behind the battery. This space was free because I removed the OEM subwoofer:

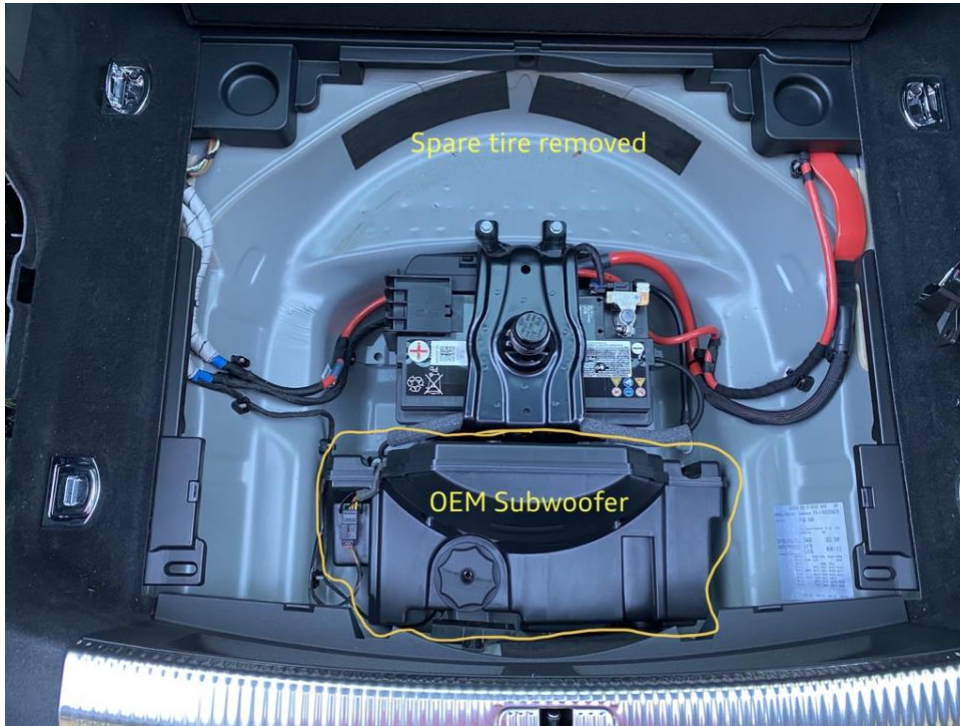


Figure 1: OEM subwoofer outlined in yellow.

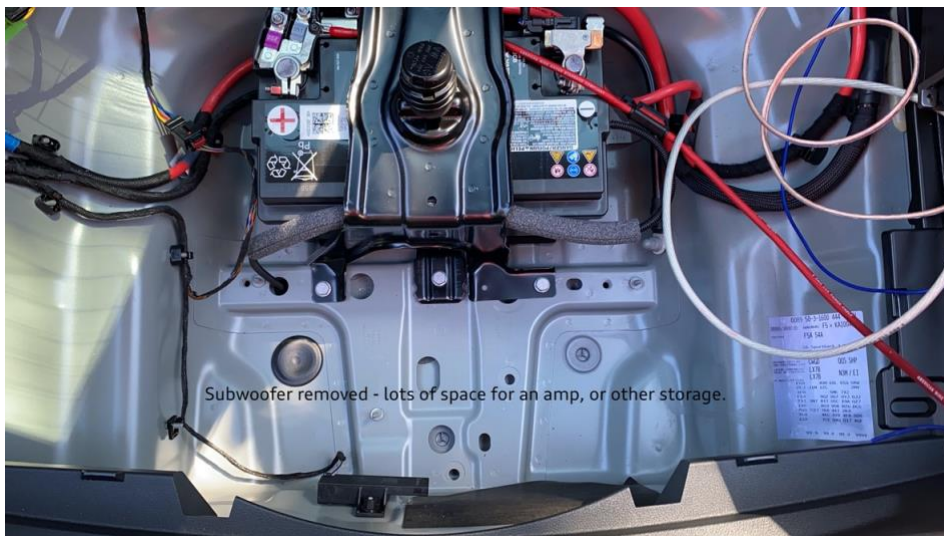


Figure 2: Same space with subwoofer removed.

Figure 2 shows another reason to ditch the OEM sub. Mounting your amp here makes the connections to the battery and to a ground location very short and easy.

The alternative is to mount the amp in the driver-side cubby space:



Figure 3: Left cubby area.

This seems to be a popular spot for the amp, but truthfully, I couldn't get my head around how to mount it in there. The upside to this location is you get to actually use all the storage space created by removing the OEM sub, if you decide to remove it. That space becomes a good place to keep your jack kit, manuals, first aid kit, etc. With my amp in that spot, I cannot put additional things down there with it.

Update – APRIL 2022: The left cubby is the better spot, in my mind, having had this system in place for about eighteen months now. I disconnected everything, re-wired it all, and mounted the amp in this left cubby area. There's a picture below, in an update to the mounting section.

II. Things You Need

1. Bruce Miranda Cable: (£60 - <https://brucemiranda.onlineweb.shop/product/audisubcable>)
2. Enclosure for subwoofer: Basser Box (<http://sklep.basser.pl/en/fit-box-enclosures/868-audi-a5-s5-f5-sportback-2-fit-box-subwoofer-enclosure.html>)
3. Amplifier. Mine is the Kicker Key 500.1 Amplifier (approx. \$250 – Amazon).
4. Subwoofer. Mine is the JL Audio 10W1v3-2 (approx. \$210 – Abt.com).
5. Grill for your subwoofer. This fits my chosen sub: JL Audio SGRU-10 Black Subwoofer Grille (approx. \$25 – Abt.com).
6. Amplifier wiring kit. Mine was 8 gauge. The Kicker amp cannot accept anything thicker.
7. Speaker wire, if not in your wiring kit. I used 12 gauge.
8. Wood screws (8) of correct size and length to secure the subwoofer in the Basser Box. I'd go with black screws if you can find them. The heads will show when you're finished, and cosmetically, I think black would be nicer. Personal preference.
9. Multimeter (optional, but helpful).
10. Heat shrink tubing or electrical tape.
11. Needle nose pliers.
12. Wire cutter / stripper.
13. Zip ties - the thinner the better.

Depending on your mounting choices, you may also need:

1. Something to mount the amp upon (piece of wood, in my case).
2. Drill, for making holes for the zip ties to secure the wires to the mounting surface.
3. Industrial Velcro.

III. Get to Work

These are the basic steps:

- Step 1 – Relocate module in passenger-side cubby.
- Step 2 – Wire and mount subwoofer to Basser Box.
- Step 3 – Wire amp and subwoofer.
- Step 4 – Connect amp to power.
- Step 5 – Finalize mounting and installation.
- Step 6 – Tune amp/subwoofer.

A. Step 1 – Relocate Antenna Module in Passenger-Side Cubby

When you remove the cover to the passenger-side cubby, you'll see an antenna module hanging there, near the top. In that location, it will interfere with the fit of the Basser Box. It needs to be relocated.

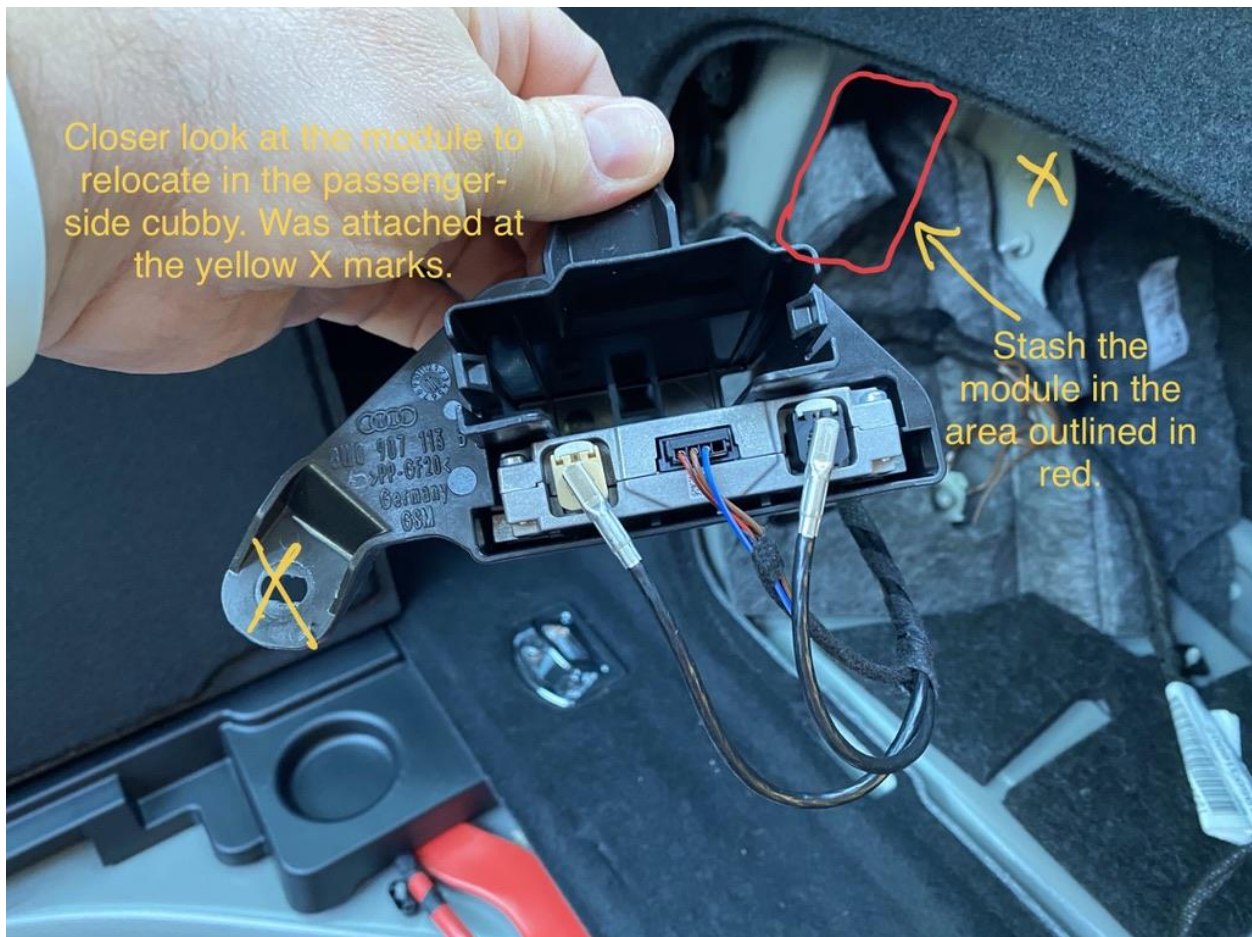


Figure 4: Antenna Module in Passenger-Side Cubby

Here's a wider angle of the passenger-side cubby:

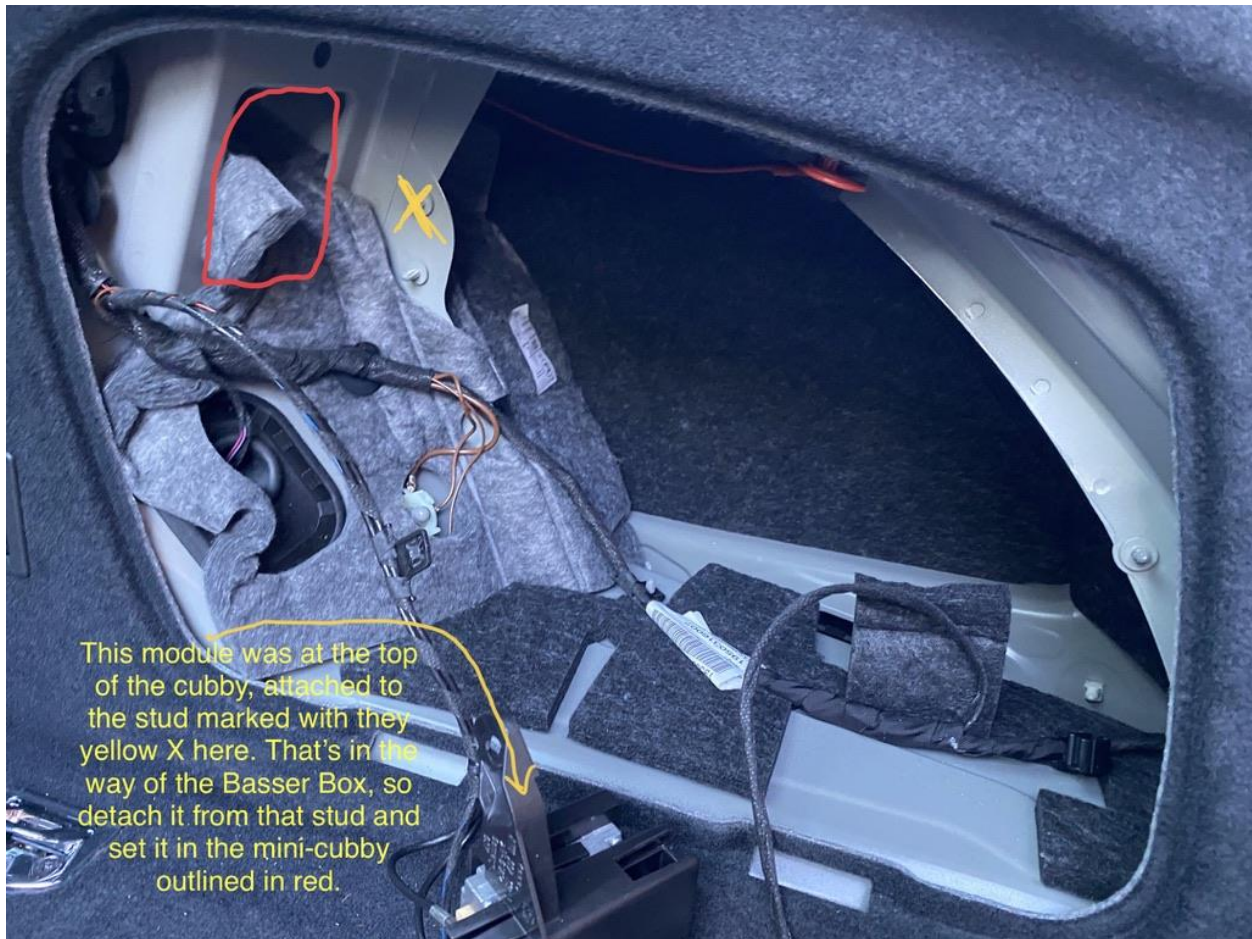


Figure 5: Wide-angle of passenger-side cubby.

There's a nut on the stud that the plastic holder for the antenna module is attached to. Remove the nut and hang on to it; you may use it later.

The antenna module is going to go in a little mini-cubby hole within this cubby. Outlined in red in Figures 4 and 5, this space is lined with thick felt. Place the module in there loose (or feel free to mount it somehow), either in the plastic holder or separated from it (I took it out of the holder, but it doesn't matter – do whatever).

While you're in this area, if you haven't already, disconnect the 12V outlet from the cubby storage bin. It's just held onto the storage bin with a plastic nut. That socket will eventually go into the Basser Box. Step 1 is finished.

B. Step 2 – Wire and mount subwoofer to Basser Box.

Set the subwoofer into its opening in the Basser Box. Get it lined up straight as best as you can, and mark the screw holes. Remove the subwoofer, set it to the side, and drill pilot holes on your marks.



Figure 6: Subwoofer resting in Basser Box.

Cut about 18" of speaker wire. You'll use this to connect the subwoofer to the terminals on the inside of the Basser Box. Strip one end to 2", and strip the other end to 1". Separate the two pieces of wire.

Check on the outside of the Basser Box for which terminal is positive and which is negative. Take the 2" stripped end of the striped wire and attach it to the positive terminal inside the Basser Box.



Figure 7: Speaker terminals inside Basser Box.

If the entire wire will not fit through the hole on the terminal, and it may not, pull some strands apart and fit what you can through the hole. Then wrap the rest of the strands around the terminal tightly and tape it on as securely as possible. Aside from simply making the connection, you are trying to really secure those wires to the terminals, because they will come under a lot of pressure when the sub is in use. Do the same with the other (non-stripped) wire, connecting it to the negative terminal.

Connect the other ends of the wires to the terminals on the subwoofer. Those connections are spring-loaded. Press one down and a hole to receive the wire will be exposed. Slide the wire through the hole and release; the spring will hold it in place. Striped wire to positive; plain wire to negative.



SIDE NOTE: In the course of this project, I learned about heat shrink tubing, and ferrules. I used some heat shrink on the amp, as discussed below (never found the right ferrules), and could have gone back and used heat shrink here, too, but I didn't feel like opening the Basser Box back up. So my wires are taped up ugly on the inside of the box. If I were doing it over again, I'd think about using heat shrink here.

Figure 8: Speaker wires attached to subwoofer.

BONUS: You don't have to do this, but if you have a multimeter, set it to ohms and touch the probes to the external Basser box terminals. I was getting between 2.5 and 3.2, which is good.

DOUBLE BONUS: Also optional, but you can check the polarities now with a AA battery. Use some bits of wire or something else that's conductive to connect the positive terminal on the battery to the positive terminal on the outside of the Basser Box; do likewise with the negative terminals. Keep an eye on the subwoofer and if all is good, you'll see the cone move out, and you'll hear it make a bit of noise. If you've got

the polarity wrong, or you reverse the battery, the cone will move in.

Screw the subwoofer into the Basser Box and you're finished with Step 2.

C. Step 3 – Wire amp and subwoofer.

Leave the Basser Box off to the side now and grab the amp, the cable that came with the amp (with RCA jacks on the end), and Bruce’s cable. Starting with the amp, dial in the settings to approximate these:

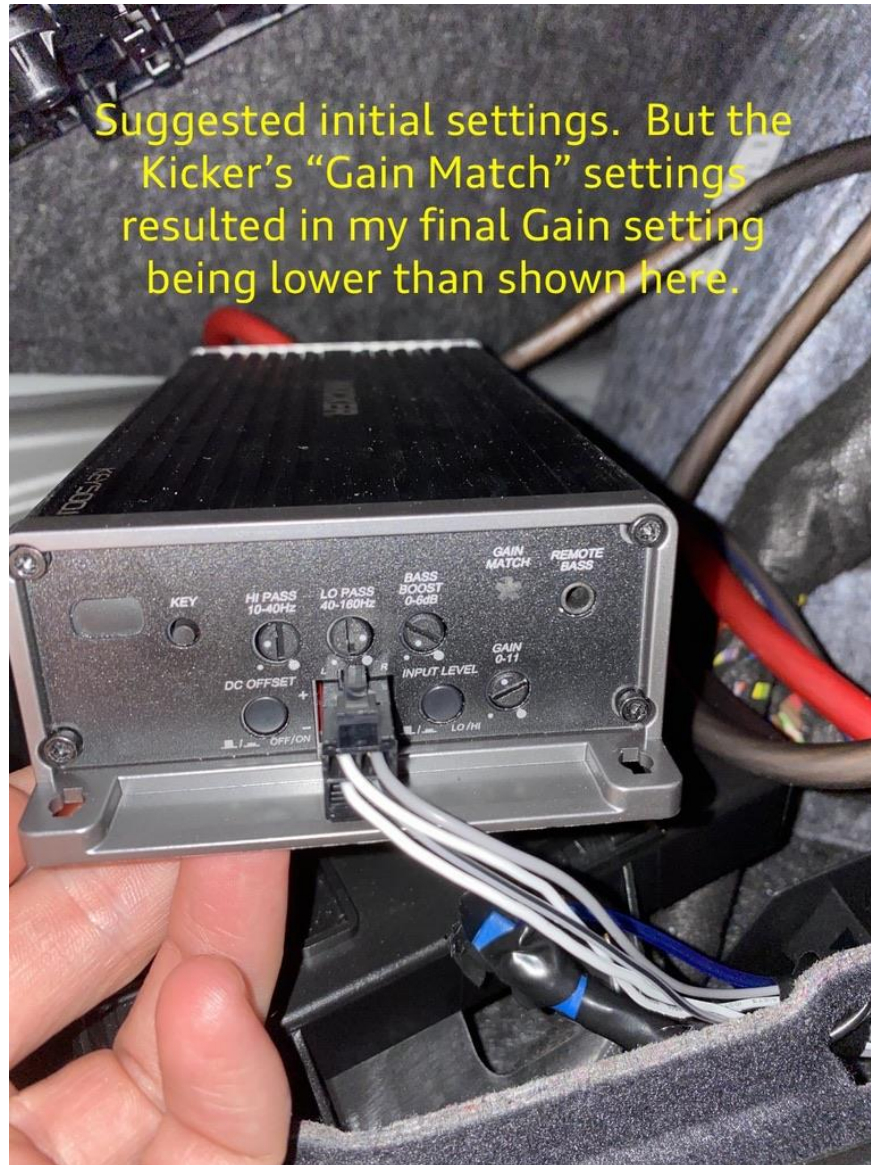


Figure 9: Initial Amp Settings

Note that the buttons on the bottom are DC Offset OFF/ON and Input Level LO/HI. Start with both pressed in, so you're set for DC Offset to be ON, and the Input Level to be HI.

On the Kicker cable, snip off the RCA plugs. That will leave you with a four pin connector on one end, and 4 bare wires on the other.

DC Offset and REM

DC Offset is worth a few words. The setting refers to whether or not the amp looks for signal coming through the speaker inputs to turn itself on. When DC Offset is ON (button pushed in), the amp is looking for signal and turns on when it detects it. A couple things happen in this mode that people may find bothersome: First, some report a delay in the amp firing up. I haven't seen that personally. Second, you may find that after you've parked and turned the car off, you'll hear the sub give a final thump. Others can explain why that happens, but it's a consequence of the circuitry involved. I get the thump, and having been assured that it's not problematic, I'm going this route presently: DC Offset ON, no REM connection. I might end up changing my mind.

The alternative mode using the REM connection is a way of having the amp turn on and off immediately – no delay, no final thump. It involves getting a 12V feed from the outlet in the passenger-side cubby and running that, through the Remote wire in your wiring kit, into the REM terminal on the amp. With REM connected, you turn DC Offset OFF (pressed out).

Finally, if you are leaving the OEM sub in place, you don't need to use the REM connection.

UPDATE – APRIL 2022: As noted above, in March 2022, I finally relocated the amp from the place in the spare wheel well that the OEM used to occupy to the cubby on the left side in the rear. I took this opportunity to re-wire (and re-establish) the REM connection. I had settled on not having the amp get its power from the 12V outlet in back, and I was getting the thump. As noted, it's fine to have that, but it never felt "right" to me, so now I'm back to using the REM connection, and I have DC Offset OFF. Better.

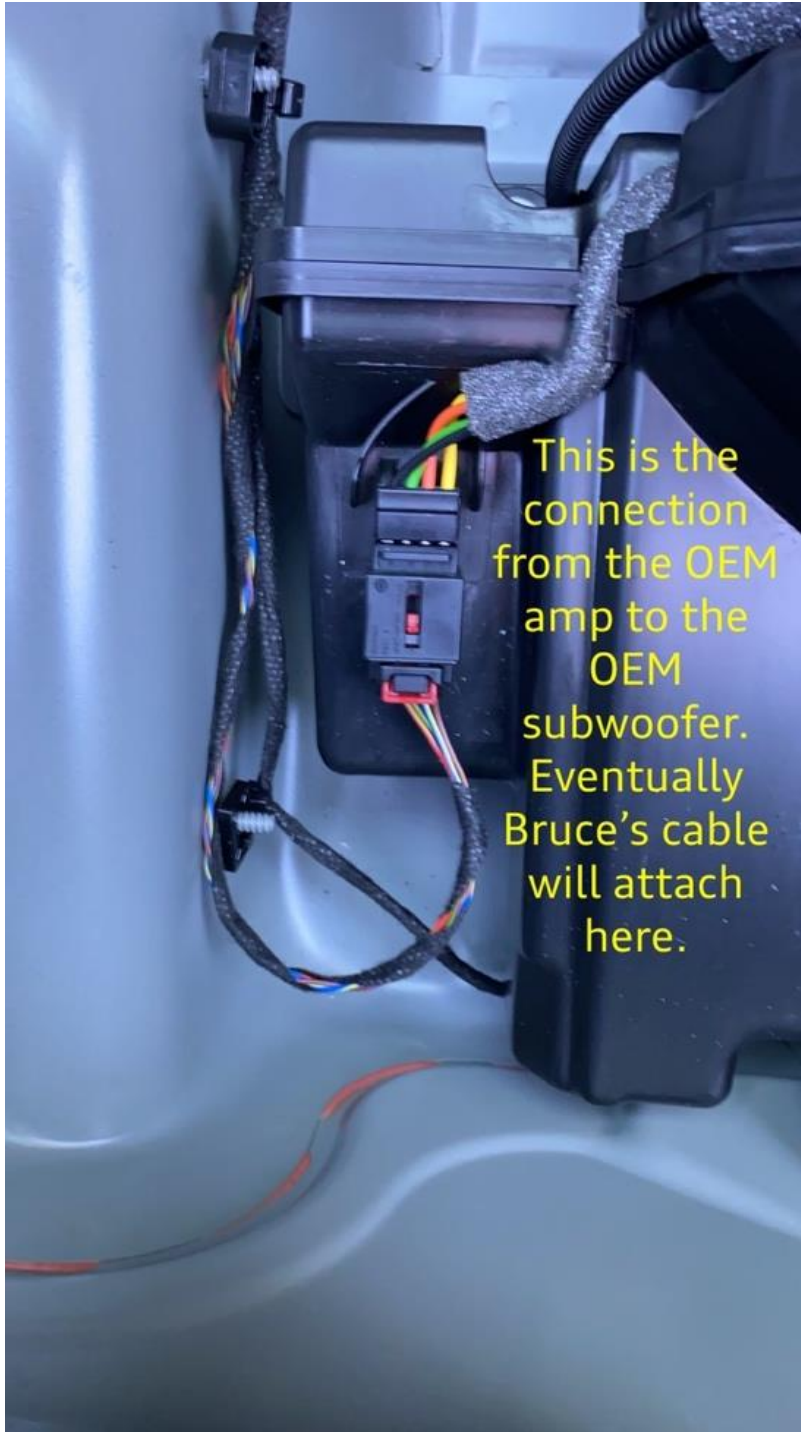


Figure 10: OEM Sub-OEM Amp Connection

Back in the car, connect Bruce's cable between the car's wiring harness and the OEM subwoofer. To do so, slide that little red tab back a bit. This will allow you to depress the black tab it surrounds, and to then pull the two harnesses apart.

Bruce's cable is idiot-proof. There's only one way for it to snap into this chain. The car harness goes into Bruce's cable, and one leg of Bruce's cable plugs into the OEM subwoofer's connector. Things now look like this:



Figure 11: Bruce's cable plugged between car's wiring harness and OEM subwoofer.

At this point, write down how the colors correspond between Bruce's cable and the OEM subwoofer's harness. In my case, it went like this, but you need to verify how your wires go for yourself:

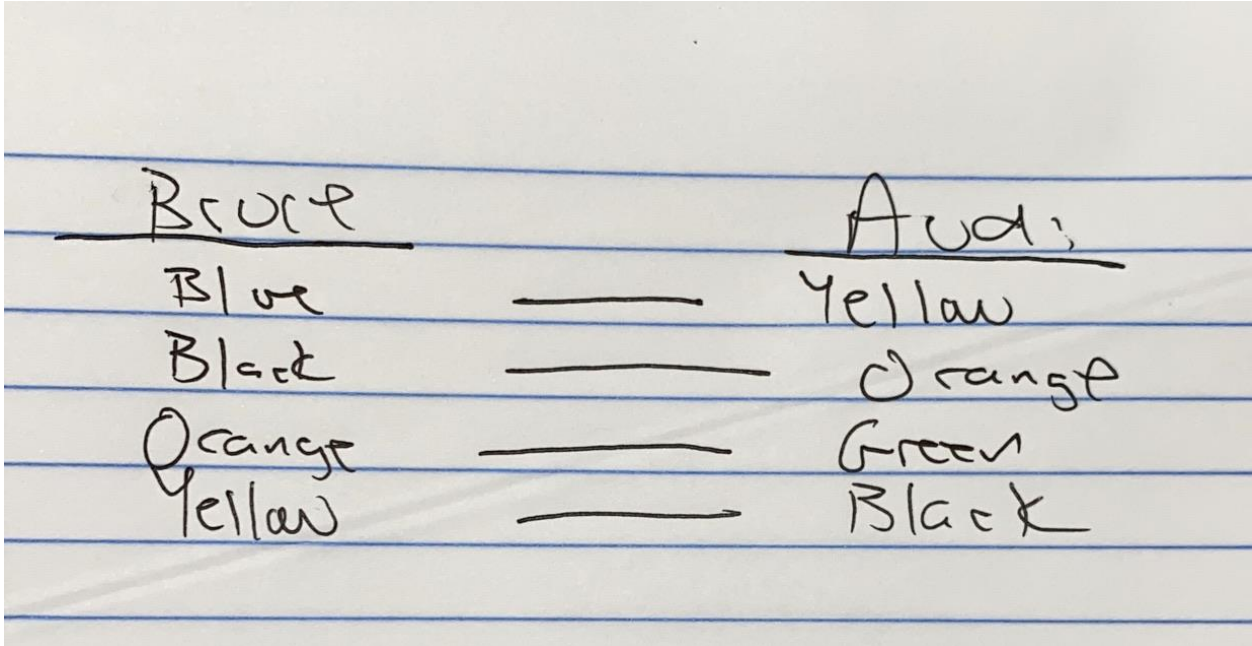
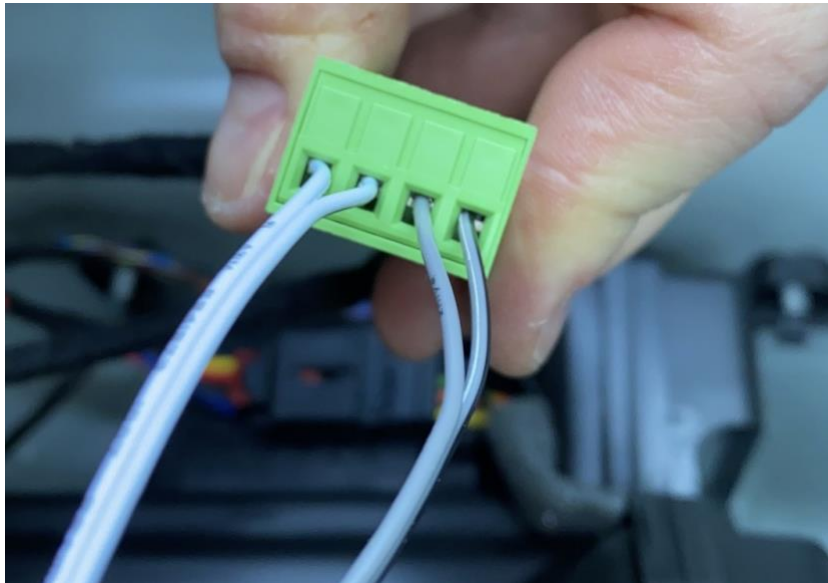


Figure 12: Lining up colors between Bruce's cable and the OEM subwoofer's connector.

Now strip about ¼" from the ends of the Kicker amp's cable, where you snipped off the RCA jacks. Note that you've got white and grey wires there, each with and without a stripe.



Briefly plug the Kicker cable into the amp, and update your note with the colors to trace the connections on the Kicker amp and cable, like so:

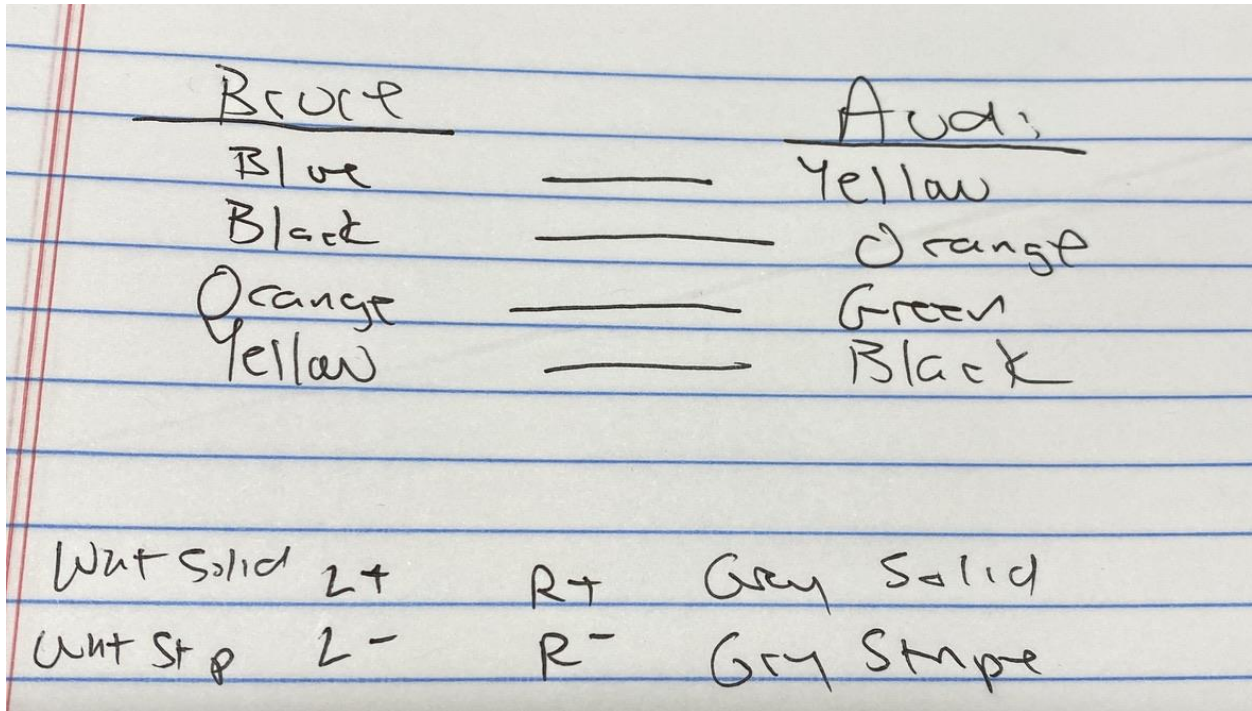


Figure 13: Tracking colors between Bruce's harness and the OEM sub's harness, and between the Kicker amp and it's cable.

Now open up the screws in Bruce's green connector and connect the stripped ends of the Kicker cable to it as follows:

Kicker Cable	Bruce's Cable	OEM Subwoofer cable
White Solid (L+)	Blue	Yellow
White Stripe (L-)	Black	Orange
Grey Solid (R+)	Orange	Green
Grey Stripe (R-)	Yellow	Black

Remember, the Audi subwoofer harness wire colors are not always consistent. Make sure you've traced the connection from it to Bruce's cable correctly, and then tie it up to the Kicker cable accordingly, as shown above.

You're done with Step Three.

D. Step 4 – Connect amp to power.

This is the final main step.

Run speaker wire from the back of the Basser Box to wherever the amp will be mounted. If you're not sure, leave yourself enough wire to get to wherever you *may* want to put it, to avoid having to re do this part (though if you had to, it isn't the end of the world). Run the remote wire at the same time, in the same length. The remote wire that came in my amp wiring kit was blue. You may or may not end up needing this. More on the remote line later.

To get the wires from the back of the passenger-side cubby out to wherever you're running them, just raise the edge of the trim / liner and pass the wires right under. I thought this would be difficult, but it wasn't.

Use the allen wrench that came with the Kicker to open up the speaker connections on the amp, and connect the red Basser terminal (striped wire, in my setup) to the positive speaker output on the amp, and the black Basser terminal to the negative output on the amp.

What is Heat Shrink Tubing?

This would be a good time to talk about what I learned about making neat, safe connections. As noted above, I had no idea what heat shrink tubing was before this project. Same with ferrules. I didn't find good ferrules, so I never used them here and instead focus on using heat shrink. You should look into ferrules, though.

Heat shrink tubing comes in all lengths and diameters. In short, you slide the tube over the wire, apply heat, and it shrinks down to fit around the wire.

Why use heat shrink? It makes your installation look nice and neat, but it also helps avoid having stray strands sticking out the sides of the terminal. This isn't such a big problem with speaker wire, but the 8 gauge power wire, for example, barely fits in the amp's terminal. If you're not careful, you'll find some stray strands outside the terminal, waiting to cause a short or some other problem. The heat shrink helps prevent that.

Strip your wire to the right length, slide the heat shrink over the wire so that just a bit is over the bare wire and most is on the insulation, apply heat and, when shrunk down, make your connection.

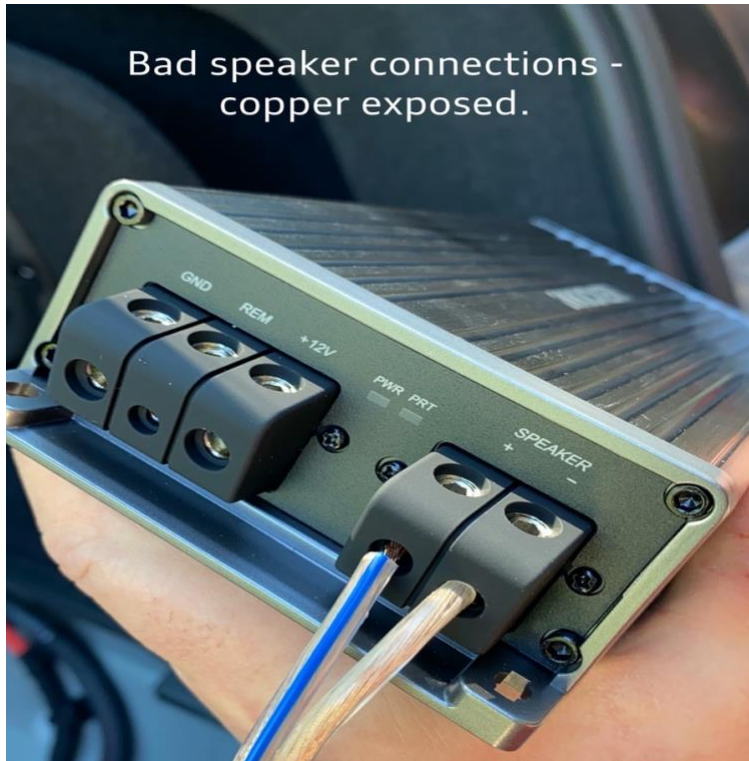


Figure 14: Bad Speaker Wiring.



Figure 15: Better Speaker Wiring



Figure 16: Good speaker wiring, using heat shrink.

After you've wired the speaker connections, move on to the power wire. Note that the power wire needs to have a fuse holder. The power wire that came in my wiring kit had one pre-installed, but you may need to wire a fuse holder into your line. In any event, once there's a fuse holder in line, DO NOT work with the power line at all unless the fuse is not installed. This is important. With the fuse out, the wire can't carry power past the fuse holder – the connection is broken. Putting the fuse into the holder will be the last thing you do. Don't do it now.

I didn't take any length off the power or ground wires at this stage. That ensures maximum flexibility, but it also ensures that you will want to go back after this is all wired up and working and make some changes. That's what I did, and I was happy for the opportunity to redo some of my wiring connections anyway.

Strip the end of your power wire and connect it to the 12V input on the amp. Screw it down tight. Do the same with the ground (GND) wire, and the remote wire. Make sure that all of the strands are inside the connector; no stray strands, please:

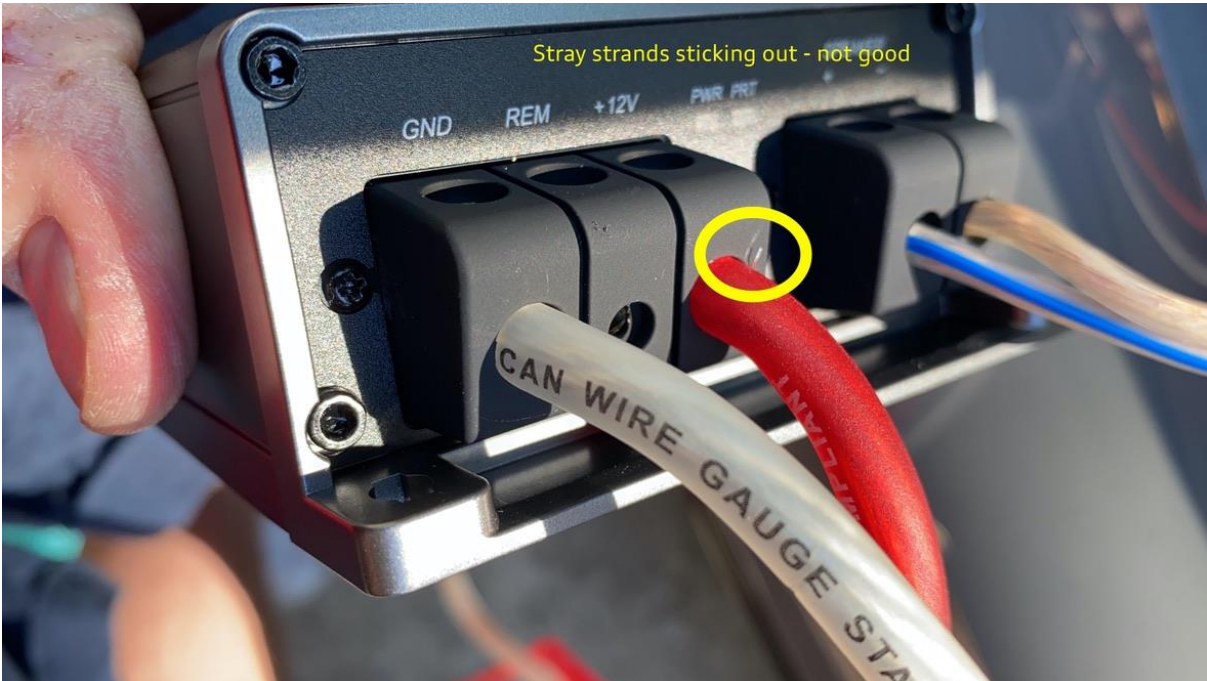


Figure 17: Example of bad power wiring at amp.



Figure 18: Example of good power wiring at amp.

Now unclip the plastic cover over the positive side of the battery. There are two pieces of plastic there that I found difficult to pry off, but you'll get it. This will expose the area to which you will connect the end of your power line with the loop on it.

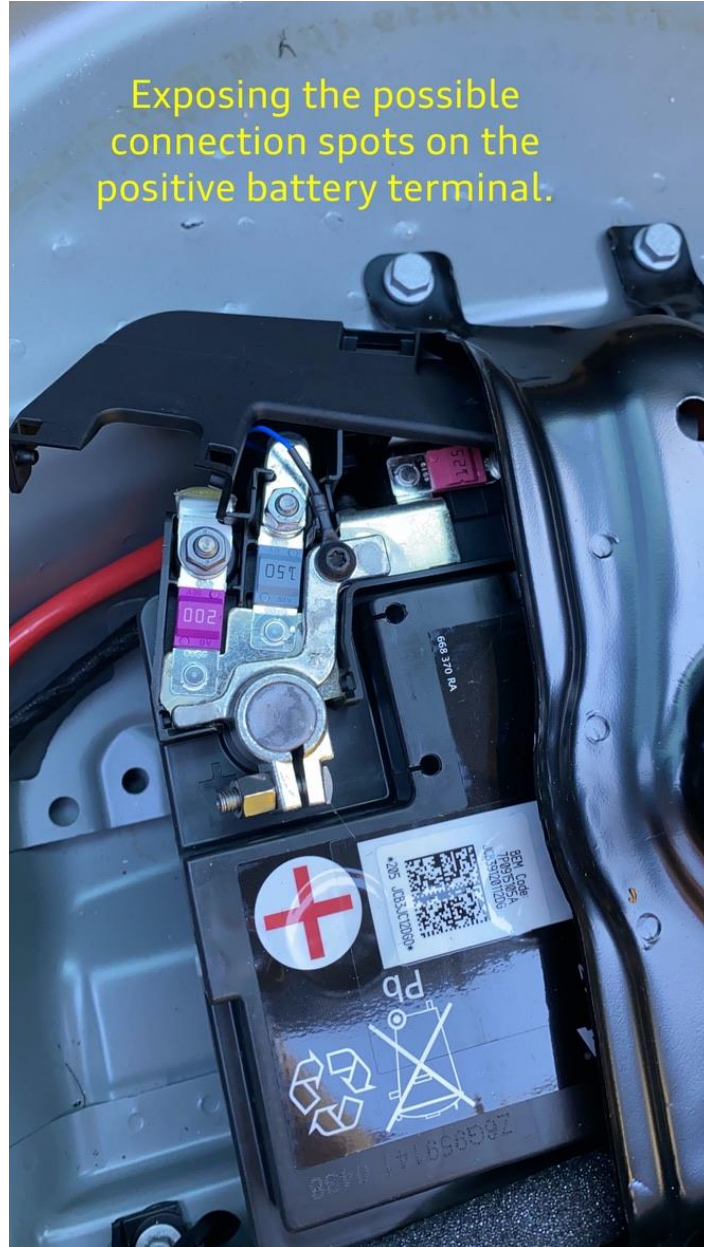


Figure 19: Positive battery terminal exposed.

I ended up using the connection at the hex nut, because that was the easiest to get off. There's a blue wire here from the car that needs to remain. Just gently undo that hex (T-25) and lay the loop from your power line on it. Before you tighten it back down, note that you're going to need to get your fat power line back under the plastic covers you removed. I ended up going toward the passenger compartment briefly, down toward the bottom of the well, out toward the driver-side, and around to where the amp is mounted. That may sound complicated, but you'll get it once you're in there. You may also come up with a better solution, but this gives you an idea:

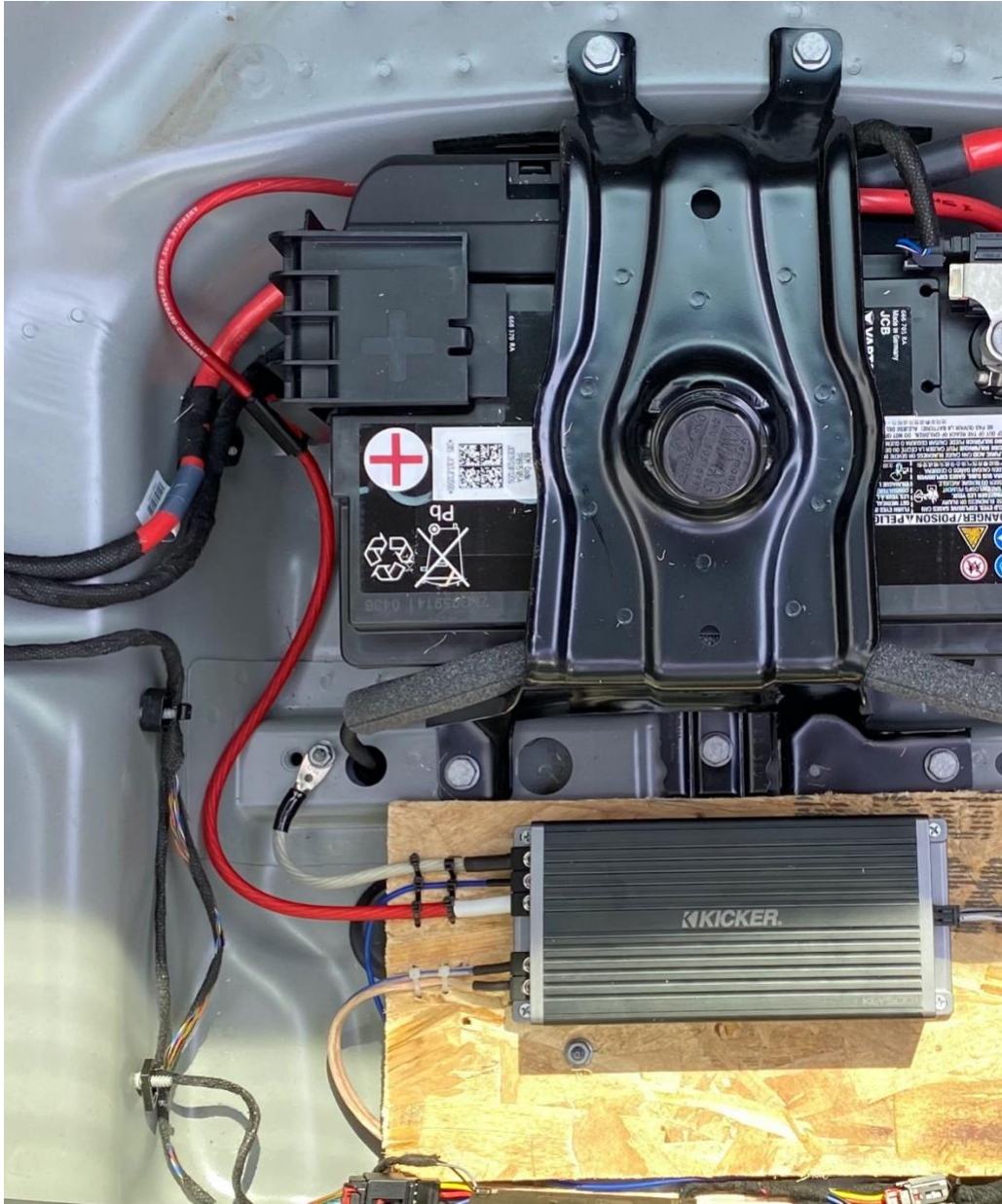


Figure 20: Trace red power line from amp to battery.

Note that Figure 22 shows the amp mounted and things tidied up. At this point in the installation, though, my amp was just resting somewhere convenient while I worked on getting everything wired and working.

The final connection to make is the GND wire. You can see where mine ended up in Figure 21, above. That stud sticking up there was one of three points used to secure the OEM subwoofer. That one in particular was held down by a plastic-feeling nut. When I secured the loop on the GND wire to this stud, I used the metal nut from where the antenna module holder was attached in the passenger-side cubby that I mentioned you may need to use again.

Anyway, if you have a multimeter and want to test this for yourself as a good GND location, set it to DC Voltage and put the red probe on the multimeter on the battery terminal, and touch the bolt I'm talking about with the negative probe. My reading was 12.5 or so, which shows this is a good GND location. One wrinkle in my particular installation is that the loop supplied on the end of the GND wire was not large enough to fit over the nut, so I had to open it up with a drill before I could fit it and secure it down. To double-check that GND connection once it's fastened down, use the multimeter on the battery terminal and the Kicker GND terminal. I got 12.5 again, so all good.

Now plug in the wiring harness to the Kicker amp. If you haven't shoved the Basser Box mostly into the passenger-side cubby yet, do so now.

The moment of truth: Insert the fuse into the fuse holder on the power wire. Did the green power LED on the amp light up? You're in business. Turn on the MMI in the car, at low volume, and set the EQ settings there to 12 o'clock. Play some music and enjoy. If this has all worked out correctly, you'll be immediately hearing a huge difference.

Post-script on this section: What to do with the remote wire we ran with the speaker wire from the back of the Basser Box? That's to remotely turn the amp on, with the 12V coming from the outlet that's supplied in the lower corner of the passenger-side cubby. You may not need it or want it, as noted above. But we've come this far, so let's go ahead and discuss how to wire that in, too. You'll make your own decision about whether you want it or not.

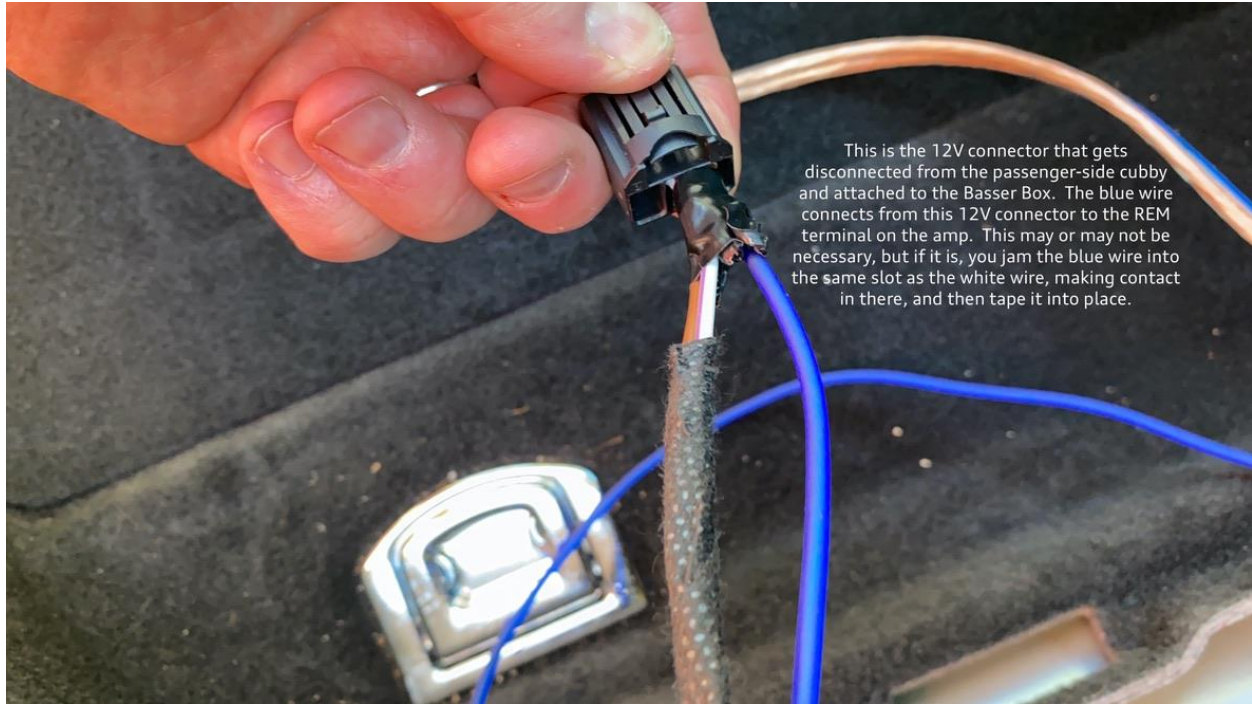


Figure 22: Installing the remote power line.

Strip the end near the cubby to maybe $\frac{3}{4}$ " or so. Double the exposed wire back on itself. Now take a look at the back of the 12V outlet. There's a white and a brown wire going into it, and if you follow them in to the outlet, you'll see a little crimp where each wire terminates. You're going to basically cram your stripped remote line into the area where the white wire connects, and tape the remote line in there well. Once you've done that, take the multimeter and touch the positive probe to the remote, and negative to GND on the amp. You may need to turn the car on, but you should get in the 12s, as I did.

This step is finished, and the project is mostly finished, too.

E. Step 5 – Finalize mounting and installation.

You've now wired everything correctly and satisfied yourself that the amp and subwoofer are working as intended with the car's system. It's time to 1) cut the wires to an appropriate length, improve any connections you wish to improve, and mount the amp in a final position.

Important Note: Before setting out on this phase, or every doing anything again involving power, you must do two things: Pull the fuse from the fuse holder on the power wire, and pull the remote wire from the 12V outlet.

Having decided to mount my amp in the bottom of the well where the OEM sub used to be, I considered how to fix it there.² I decided to use a combination of industrial Velcro and one of the mounting points for the OEM sub. In sum, I cut a scrap piece of OSB (engineered plywood) to size, and drilled out a hole on it at the location of the nut I'm talking about, as seen here:



Figure 23: Mounting the amp.

Obviously I've disconnected all of the wiring here, which was fine as much of mine needed improving. I laid out the wires anyway, and marked spots to drill very small holes to accommodate zip ties. The reason to do this is to make sure that the wires stay put, even if they manage to come free from the amp itself. You wouldn't want, for example, the wires to come into contact with each other, or with the metal surface inside this area of the car.

Get the amp wired up again, and zip tie things down securely:

² The basic idea for this approach came from "Rob01S4" on the AudiWorld forums.



Figure 24: Final Wiring and Tie Down

Once my platform for the amp was ready to go, I inserted the fuse, checked everything once more, then pulled the fuse again. I wiped the area at the bottom of the trunk clean with a rag, collecting all manner of little bits of copper, insulation, etc., then placed two healthy pieces of industrial Velcro in the raised areas I knew would come in contact with my OSB platform:

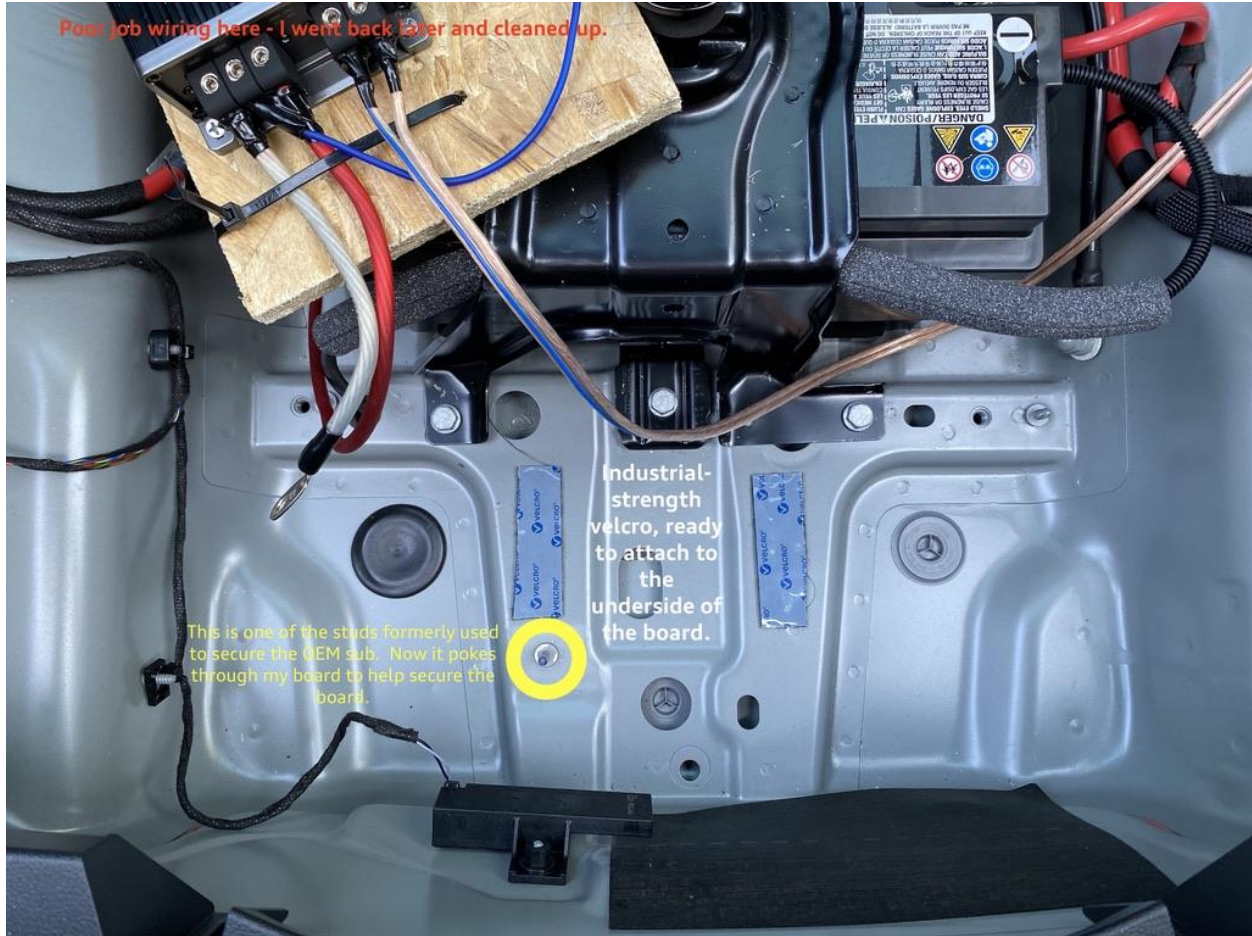


Figure 25: Preparing area for final installation.

After exposing the adhesive on the Velcro, I carefully placed the platform in the area, aligning it with the nut so that came through the hole I'd drilled for it. I applied pressure for a while to get the Velcro to stick to the OSB, and then I also fastened the board down with the nut I removed from what is now my GND location. Between that nut and the Velcro, it's plenty solid and going nowhere. It's also easily reversed if I ever wanted to do so.

Here's how it looks fully installed:

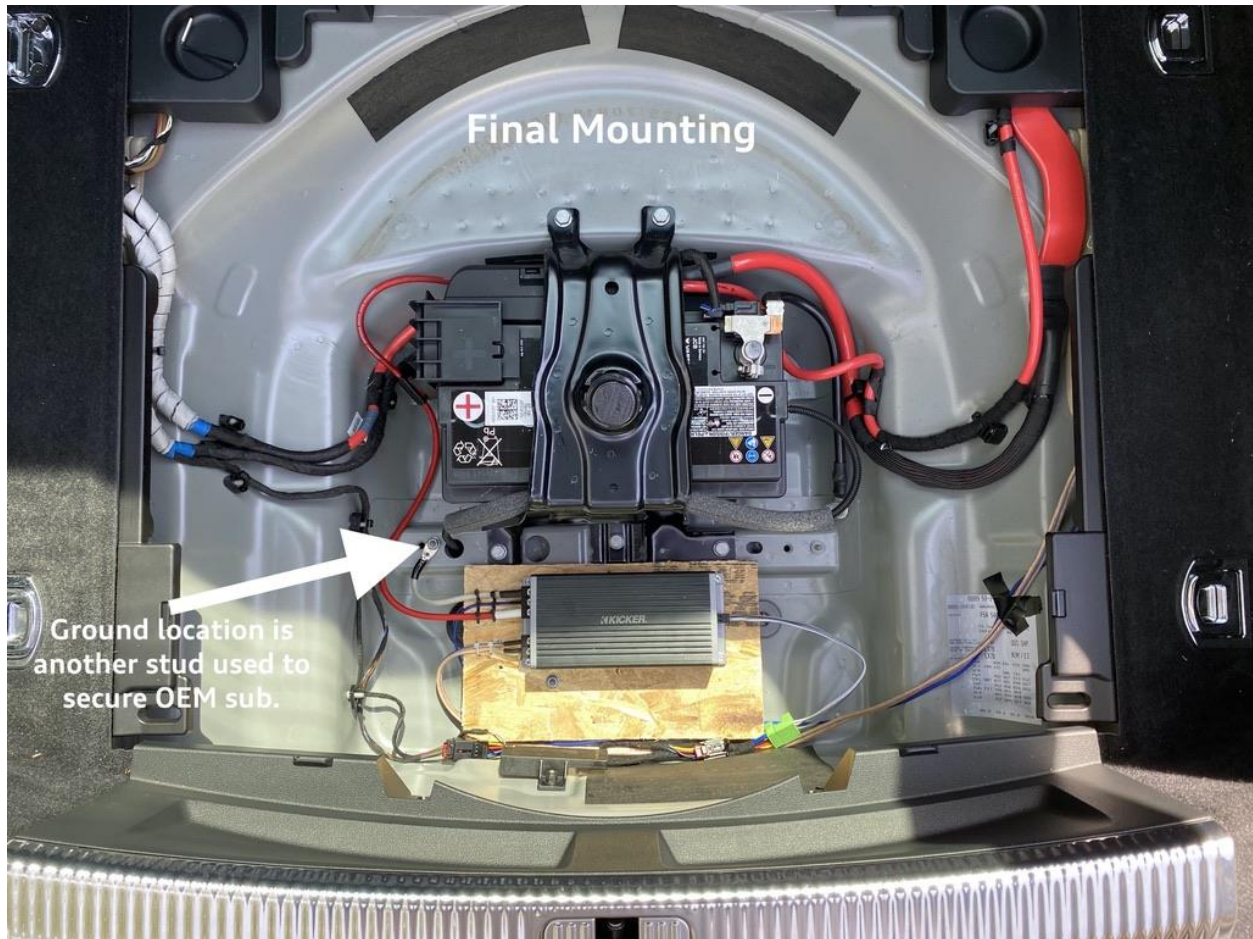


Figure 26: Final Amp Mounting.

I should also say that my Basser Box fits quite snugly in the cubby, such that I've taken no steps to secure it there. I intend to, but refer to the threads on AudiWorld for tips on doing this bit, which is really small stuff at this stage.

While my mounting location is not the most efficient use of that space freed up by removing the OEM subwoofer, I still managed to wedge the jack bag (which is delivered by the factory – most inelegantly – attached to the tiedowns on the surface of the trunk) next to the spare:

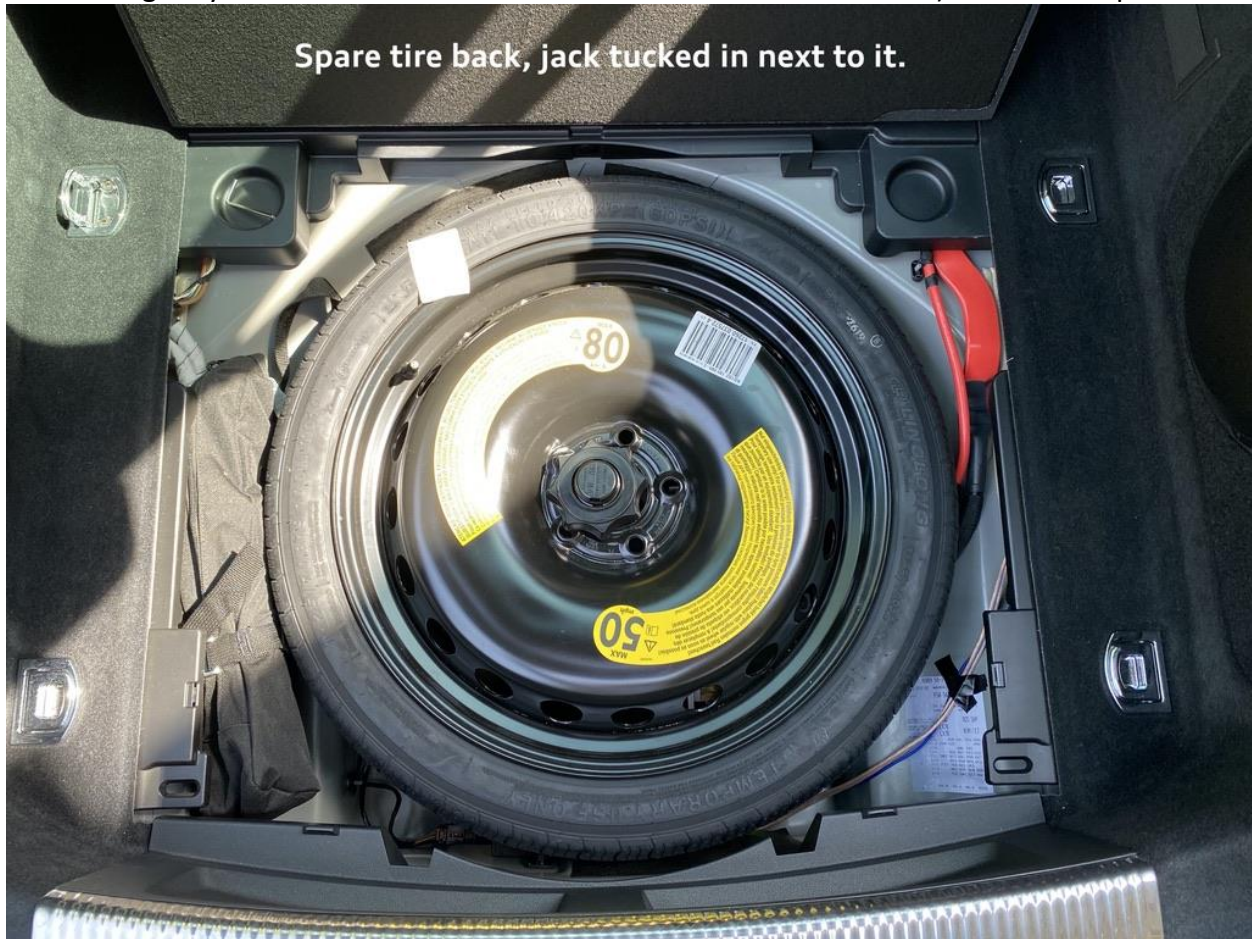


Figure 27: Spare tire back in place.

UPDATE – APRIL 2022 – I’ve abandoned the wheel well mounting location for the amp, in favor of the left cubby. No genius solution to how I secured it in there – I just used a zip tie around the amp and underneath the plastic tray, and I also used some industrial Velcro. This has been in effect for about a month now, and it seems rock solid. Here’s a photo:



Figure 28: Final Mounting Location - Left Side Cubby

But wait! Do you see that plastic bit at the top of the cubby, above where my amp is sitting now? Evidently, someone has created plans for a 3D-printed bracket that will attach up there, and hold this particular amp. I learned of this days after I moved and re-wired the amp, or I'd have explored further. So I don't know how well it works, but if you're inclined, give it a look:

<https://www.thingiverse.com/thing:4722938>

Don't forget the grill on your subwoofer to protect that speaker from whatever ends up going in the trunk:



Figure 29: Installation Complete

F. Step 6 – Tune amp/subwoofer.

You should probably do this step before replacing the spare tire, if you've mounted the amp where I did. Otherwise, pull it back out because you need to access the amp to follow the steps described in the Kicker's manual. Not having to pull it back out is your reward for having read through this entire guide first before getting started.

Follow the manual's instructions for tuning. This is basically a two-step process, once you've downloaded the test tones you'll need (download the .wav files, not the .mp3 files). I put them on an SD card and then used that to transfer them to the car's hard drive. Not necessary, but handy, and they'll be there in the future if I need or want to redo these steps.

Basically, the first thing to do is to Gain Match, where you come to a final position for the Gain control on the amp. Mine ended up just a shade lower than the original starting point shown above. Then you do the Key process, and you're finished. It's easy enough to follow in the manual, and worthwhile.

From here, you can make small adjustments in the MMI as needed; you may find that one source or another needs help.

IV. Conclusion

This is a great project for anyone – no matter your level of experience working in modern car audio systems – who cares about how music sounds in your car. I'd have never tried, let alone succeeded, absent the contributions on the AudiWorld forums, and in particular I'm indebted to Bruce Miranda.

Go do it!