Upgrading the Amplifier in a Jaguar F-Type.

Background.

So, let's start by clarifying the title. I have a 2016 F-type R with the 380w Meridian system. This is also know as NLI level C system or Incontrol Touch. Unlike the earlier models you can't swap out the amplifier for the 770w system. The 2 systems are incompatible and there is no manufacturer route for improving the amplifier. In other words it's a dead end.

Most forums you check you will find that the most people think the cars natural sound track is fantastic, but the actual entertainment system is poor, even the 770w. I am no different, it is definitely a weakness in the car. I have tried to improve the sound by upgrading all the speakers in the door, to JLR's signature speakers, as well as applying sound deadening material to the door cards and the skins. This has definitely improved the sound, but not to the point where I am happy with it.

The 380w system is a 12-channel amplifier, so 30w per channel. 1 channel for each speaker in the doors (6), plus 2 for each subwoofer in the rear, and the final 2 channels powering a speaker in each rear side, that is described as 'low' in the wiring diagram.

Approach

The picture on the left shows the rear speakers, the lower speaker is a 180cm subwoofer that is dual coil unit, and the upper speaker is a square unit that looks a bit like an oversized tweeter. Most people have avoided upgrading these units as they are very much custom for the F-type, and mounted in a moulded frame, which attaches to the bulkhead.

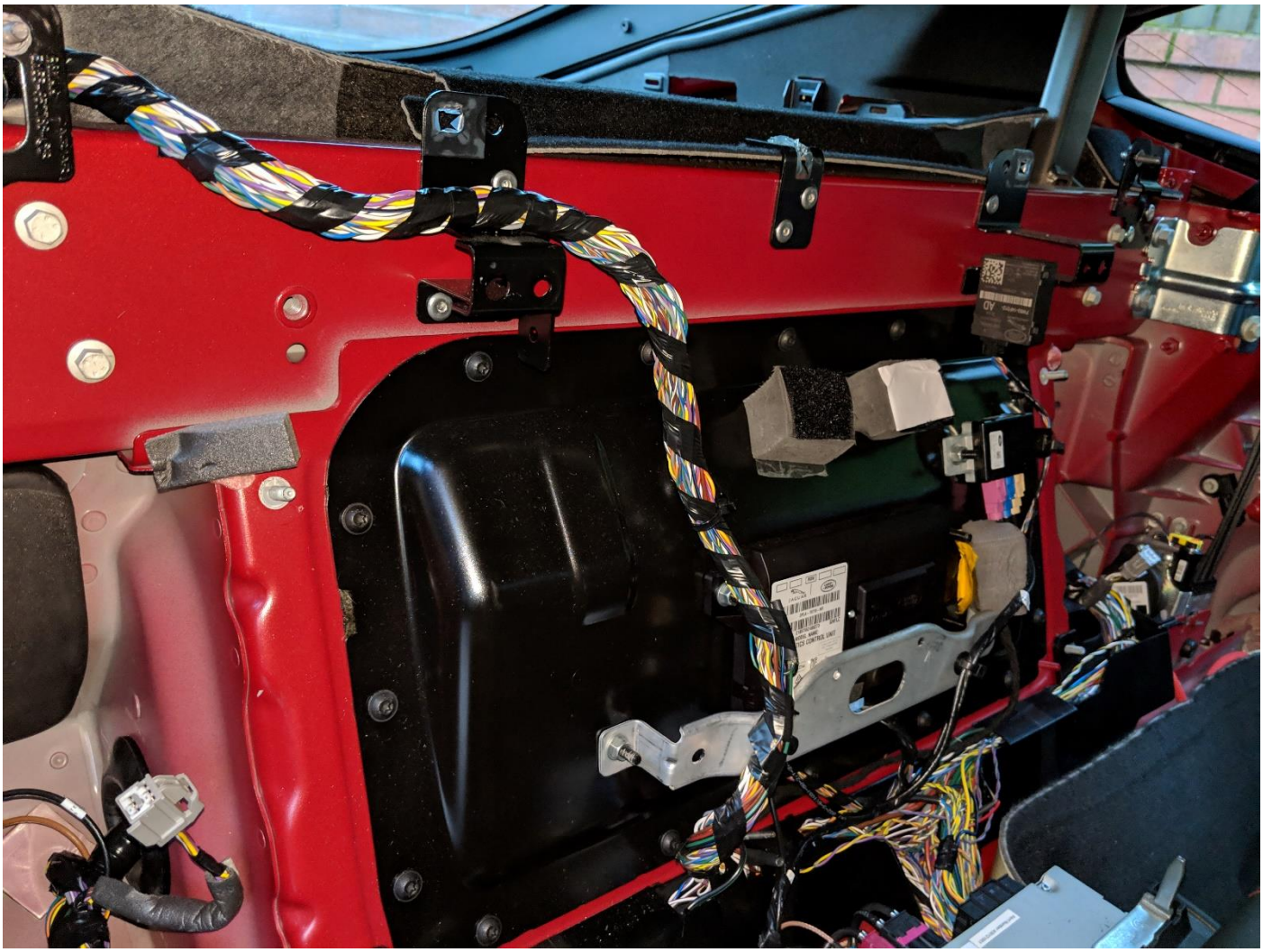
If you have the standard F-type, non Meridian Stereo, you wont have these in your car. I'm not sure if this is a good or bad thing because the paper cones in the subs, are really thin, and it doesn't appear to be a high quality speaker. So I wouldn't be surprised if they were contributing to the problem.

As part of my upgrade this time around, I am going to cut the subwoofers out, and replace them with Hertz Mille Legend 1800.3 speakers. I hope to mount them within the existing frame. This is an irreversible step as the frame forms part of the original speaker.

The second step is focused on the amplifier. The 380w amplifier does more than just process the audio inputs, as it takes a number of input sources as well as signals from the canbus. I don't know exactly what extra it does do, but my fear is that if it is removed from the vehicle, I will lose functionality. So, I am adding into the loom a signal processor and amplifier in one. This takes the signals from the output of the existing amp, flattens the signal back to its original form and cleans it up, then allows you to configure it for your vehicle, and then amplifies the signal into 8 channels (520w so 65w per channel). The unit I have chosen for this is the Audison AP8.9 bit. The Hertz speakers cost £500, and the Processor/ Amp is £700 at the time of writing.

Prep work

This isn't for the faint hearted! Be prepared to remove most of your interior trim behind the seats. Below you can see the rear bulkhead after the panels and rear speakers have been removed. The main loom you can see in the picture is predominately from the Audio Head Unit, to the amplifier.

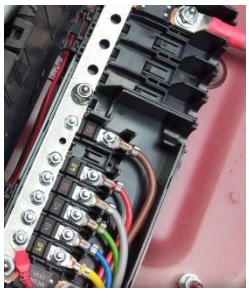


This is a point to note as the coupe has its amplifier tucked away behind the rear bulkhead below the rear quarterlight on the right-hand side of the car. The convertible amp is mounted in the centre of the front of the rear bulkhead.

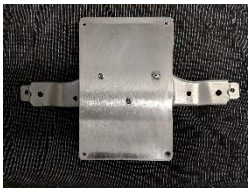
The prep work is broken down into the following items:

1. **Trim**. The workshop manual says that you need to remove the seats to remove the rear bulkhead trim, but I managed to extract it without having to take the seats out. You need to remove the trim around the door, and then the two panels in the boot that the parcel shelf sits on (coupe) and then the small cubbly hole hatch between the seats. After this you need to unbolt the seat belts from the floor. You can then pull out the rear shelf, followed by the two panels that hide the subwoofers.
   You also need to strip the boot, so you can access the distribution box and feed the wiring through. This means lifting out all the floor panels that lift up. Then removing the remaining floor panel towards the bulkhead, followed by the panel at the back of the car near the washer fluid. Removing the luggage retaining loops, then allows you to remove each of the side panels. You don't need to remove the rear panel to feel the wires through.
2. **Wiring**- Obviously this will be different dependant on the entertainment system you have in your vehicle. But it should roughly involve:

a. **Power**. The battery is in the rear boot under the floor and has a distribution box next to it. I am going to take two power feeds (more on why two later) from here and feed through the bulkhead on the left-hand side of the car. I am using some fairly thick cable rated at 50amps for this. The fuses are bolt down midi fuses, and I am going to use the spare slot in the junction box for the power for the Audison. This will mean removing most of the rear boot space to neatly feed the cables through. If you are planning to do this and currently use a trickle charger. This is a great time to install a CTEK comfort indicator panel. The negative supply will be from a point closer to the amp.



b. **Amplifier bracket**. There is a metal strip across the rear bulkhead across which I plan to mount the amp. This means making up a bracket to bolt the amp to the metal strip. I used a bit of stainless-steel sheet metal pop riveted to the metal strip to achieve this. The box the amplifier comes in has a template on the rear.



c. **Wires and more wires**. In simple terms the speaker out from the current amplifier needs to be feed into the AP8.9, and the speaker out from the AP8.9 needs to connect to the speakers. This means cutting into the existing loom and inserting the AP8.9 in the signal path. I have explored a number of ways of doing this. I used Molex connectors on each end of the cut so I can easily remove my mods out of the car if I need to. The Audison also uses Molex connectors, So I am going to make up a loom with Molex on each end. That way I don't need to use the connectors that came with the Audison, and worry about joining wires. I can also double check all my work before installing in the car. I am also going to put a Molex 4-way connector on the subs before connecting to the AP8.9 bit (I'll explain later).

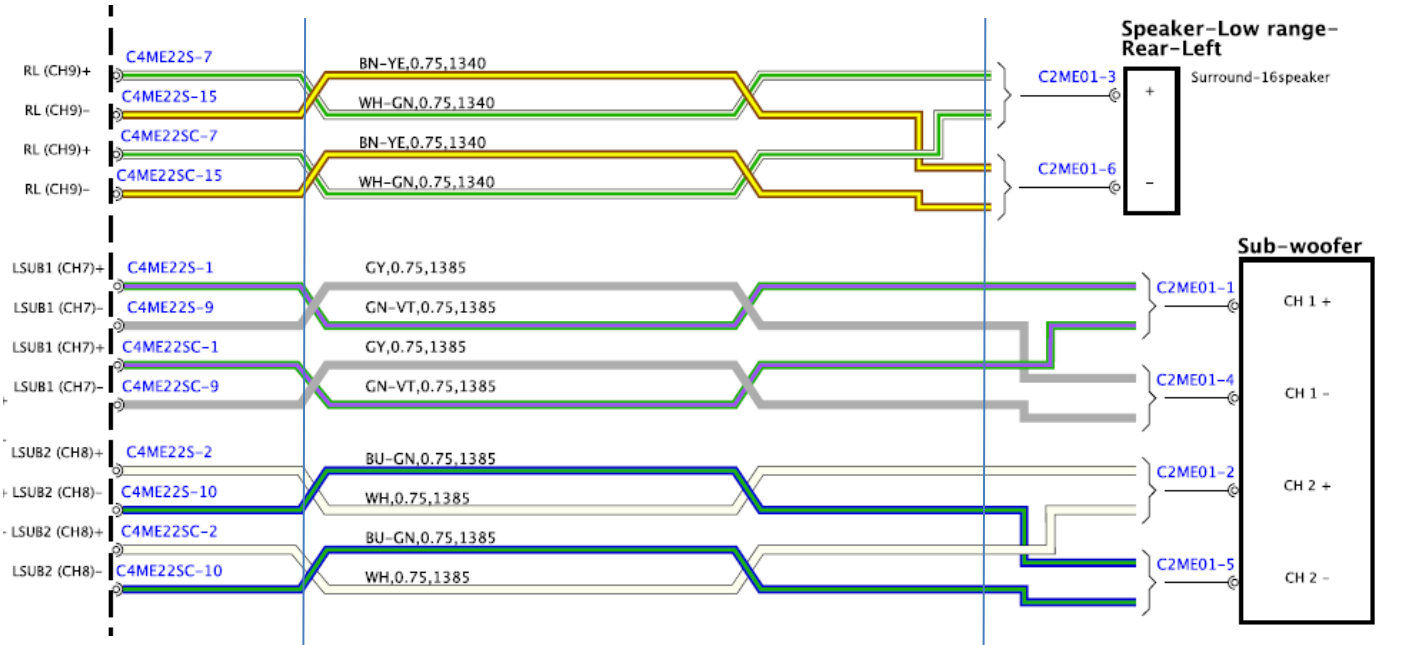
3. **Sound deadening** – just like the car doors, the rear bulkhead panels will probably benefit from the addition of some sound deadening material. I used some Dynamat extreme for this.

Design

I don't think there are too many options here as you need to rebuild the stereo signal from the speaker out on the original amp. Since I don't know what the rear speaker is, my only option is to rebuild from the front and use the three channels from the front door. This will then form 6 channels out, with the two remaining channels powering the new rear subs. I will continue to use 2 channels on the original amp to power the remain rear speaker. This will probably just about wipe out the rear effects, and negate the front rear fade, but I'm hoping it won't matter.

Existing Amplifier wiring.

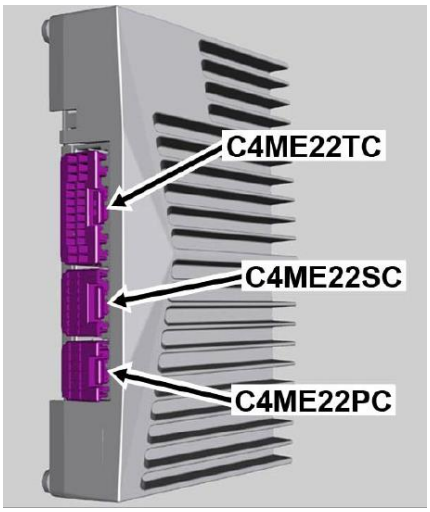
The jaguar wiring diagrams look like this:



Connection at the amplifier end	Wiring codes and Specification	Destination Connectors and item connected too.

Using this information, I noted the existing connection on my amplifier, and bought the appropriate matching cable to extend the loom to the new Audison AP8.9 amplifier.

Jaguar Amplifier Channel	Speaker	Connecting block on Amplifier	Jaguar Wiring Codes	Destination Connection
CH1	Front Left Tweeter	C4ME22TC	GN-OG(+) GY-OG(-)	C3ADR
CH2	Front Right Bass	C4ME22PC	WH-VT(+) WH-OG(-)	C3BDR
CH3	Front Left Mid	C4ME22PC	GN-BU(+) GY-BU(-)	C3ADR
CH4	Front Right Mid	C4ME22PC	VT-GY(+) YE-GY(-)	C3BDR
CH5	Rear Right Sub	C4ME22SC	VT(+) YE(-)	C2ME02
CH6	Rear Right Sub	C4ME22SC	WH-BN(+) VT-OG(-)	C2ME02
CH7	Rear Left Sub	C4ME22PC	GN-VT(+) GY(-)	C2ME01
CH8	Rear Left Sub	C4ME22PC	WH(+) BU-GN(-)	C2ME01
CH9	Rear Left Low	C4ME22SC	WH-GN(+) BN-YE(-)	C2ME01
CH10	Rear Right Low	C4ME22SC	BN-WH(+) BN-BU(-)	C2ME02
CH11	Front Left Bass	C4ME22PC	WH(+) WH-BN(-)	C3ADR
CH12	Front Right Tweeter	C4ME22TC	VT-OG(+) YE-OG(-)	C3BDR

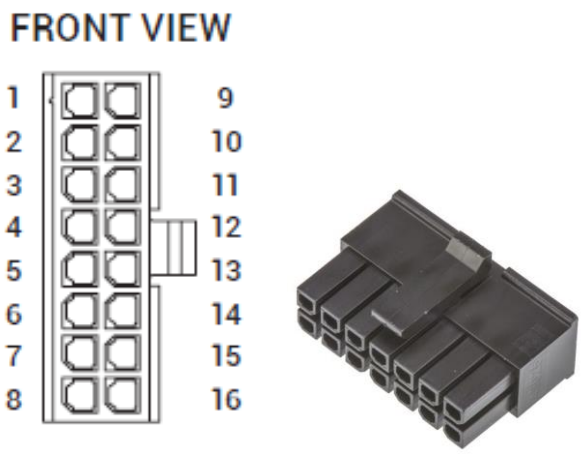


The first job is to create the loom to connect the speaker outs from the existing amplifier into the Audison. The amplifier has TE connectivity Multilock Hybrid (0.70,0.40) Connectors. However they are only available as wire to board configurations. So in other words you cant create a loom using these connectors as one end is designed to be mounted on a circuit board. So you will be cutting the loom !!

Since the connections on the Audison are Molex, I decided to use these to terminate the ends of the loom. This will allow me to create a set of looms that can easily be removed if needed and the system returned to factory state.

The Audison 'IN' connector is a black Molex Micro Junior 3.0 16 way connector. The first twelve connectors of the block are for inputs. I therefore wired the block to the three speakers in each door, excluding the rear, as this was to remain on the Jaguar Amp.

Speaker	Polarity	Cable Colour	Micro Molex Pin
Front Left Tweeter	negative	Grey-Orange	8
Front Left Tweeter	positive	Green-Orange	16
Front Right Bass	negative	White-Orange	3
Front Right Bass	positive	White-Purple	11
Front Left Mid	negative	Grey-Blue	6
Front Left Mid	positive	Green-Blue	14
Front Right Mid	negative	Yellow-Grey	5
Front Right Mid	positive	Purple-Grey	13
Front Left Bass	negative	White-Brown	4
Front Left Bass	positive	White	12
Front Right Tweeter	negative	Yellow-Orange	7
Front Right Tweeter	positive	Purple-Orange	15

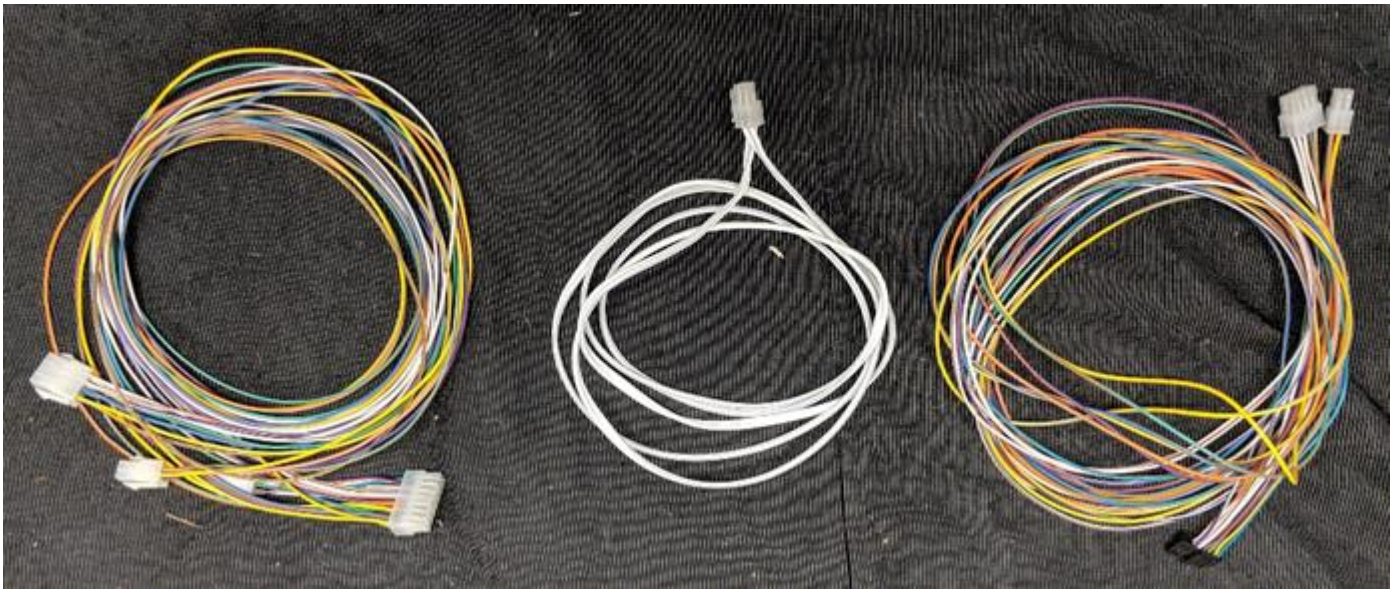


Breaking out connections on existing loom

Connections out from Audison

Pin	Ch	Colour	Speaker	Location	Side	Car Wiring	Amp Block Molex Pin	
1	8 -	White/Black	Subwoofer	Rear	Left	Blue-Green	4 pin	1
9	8 +	White	Subwoofer	Rear	Left	White	4 pin	3
2	7-	White/Black	Subwoofer	Rear	Right	Purple-Orange	4 pin	2
10	7+	White	Subwoofer	Rear	Right	White-Brown	4 pin	4
3	6 -	White/Black	Bass	Front	Left	White-Brown	8 Pin	1
11	6 +	White	Bass	Front	Left	White	8 Pin	5
4	5 -	White/Black	Bass	Front	Right	White-Orange	8 Pin	2
12	5 +	White	Bass	Front	Right	Purple/white	8 Pin	6
5	4 -	White/Black	Tweeter	Front	Left	Grey-Orange	4 pin	1
13	4 +	White	Tweeter	Front	Left	Green-Orange	4 pin	3
6	3 -	White/Black	Tweeter	Front	Right	Yellow-Orange	4 pin	2
14	3 +	White	Tweeter	Front	Right	Purple-Orange	4 pin	4
7	2 -	White/Black	Mid	Front	Left	Grey-Blue	8 Pin	3
15	2 +	White	Mid	Front	Left	Green-Blue	8 Pin	7
8	1 -	White/Black	Mid	Front	Right	Yellow-Grey	8 Pin	4
16	1 +	White	Mid	Front	Right	Yellow/purple	8 Pin	8

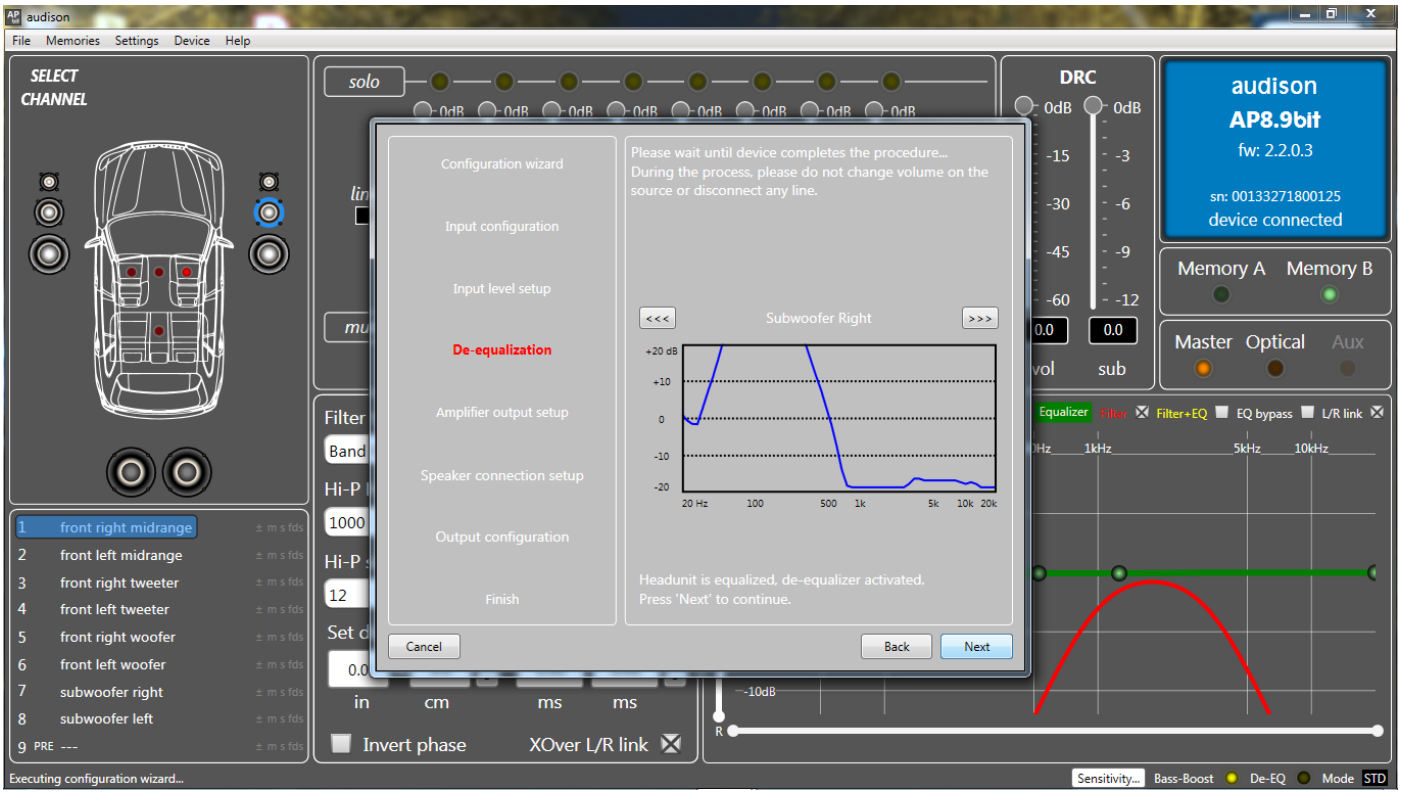
The connections into the audison are determined by how you configure the amp in the following section. I selected 2 way fronts + subwoofer L&R as my six channel input.



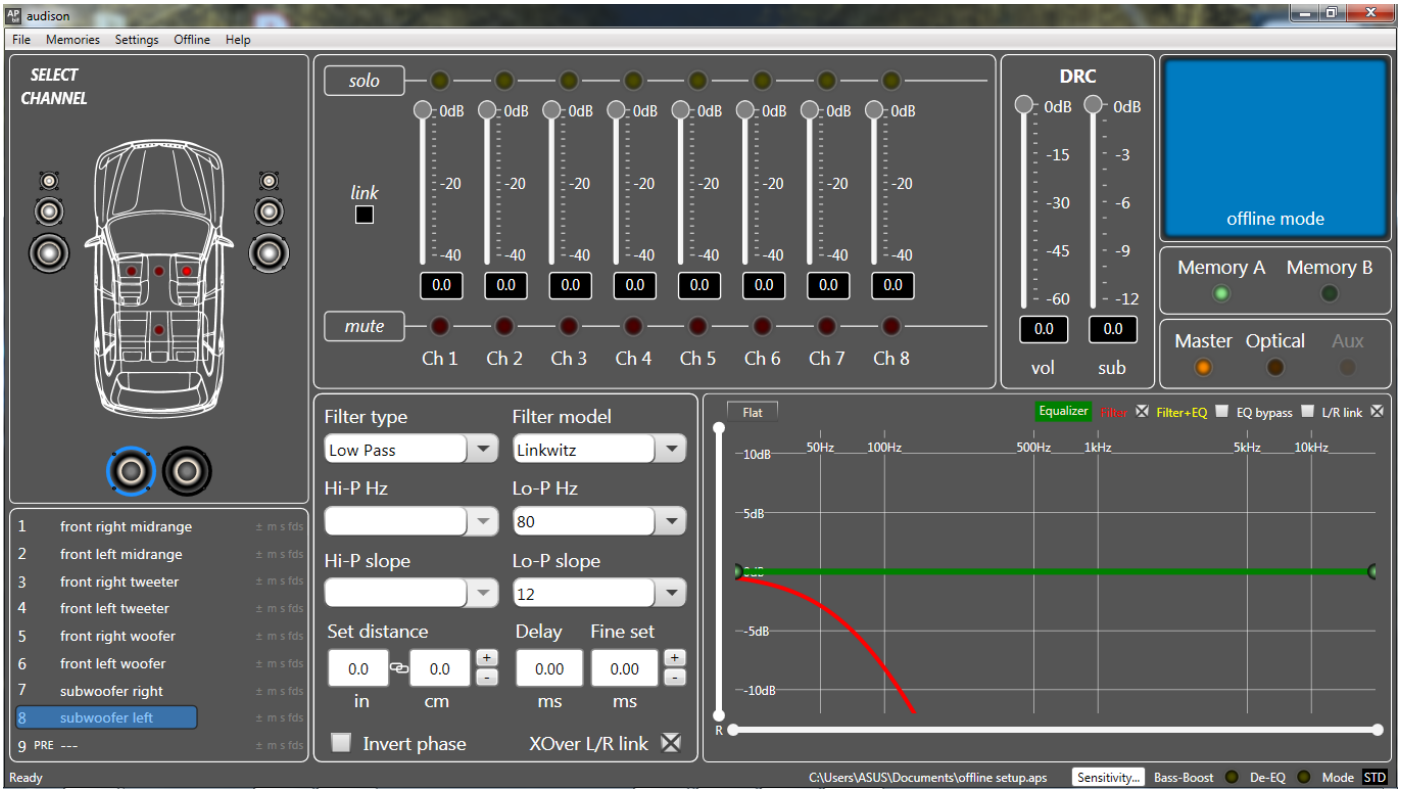
The wiring diagrams for the looms I have made up, are as follows (but, please check yours as these are specific to my car) :

Configure

Once everything is wired in, the next step is to configure the Audison AP 8.9 bit. The first step in this process is to configure the sound inputs and run the tests for the de-equaliser. This is a bit of a pain because the speakers need to be disconnected before you can run the tests. This is okay for the speakers connected to the Audison as they can be easily unplugged. But it still leaves the rear speaker that is connected to the jaguar amplifier. This needs to be disconnected.



Once the tests are completed, you can then personalise the amp. The first step is to configure the output. For my design, that is 3 way at the front plus left and right subs that are mounted in the rear. After you have completed the configuration wizard, you can then plug the speakers back in and start to tune the system.



Future

I mentioned earlier that I was feeding two wires power wires. This is because there is the option to add a second Audison amplifier. The AP8.9 has a sub line out connection that can feed an amp for the sub. This can be the ADP-1, which provides a dedicated 520w for up to two speakers. The additional amp can be stacked on the first. And yes, that's why I have put the 4-way Molex on the subs, as this will connect straight into the ADP-1. The channels freed up on the AP8.9 bit can then be put in bridge mode for the woofers (or Mids.) in the front door speakers. I have built out the bracket to support the additional amp, so if I do decide to go down this route, it will be a plug and play exercise.