

ZIRCONIUM

TOOLS PROD0291



- Soldering pen and solder tenn (not in Picture)
- Cable cutter with correct setup
- side cutter small
- Long allen tool M2.5
- short Allen tool M3
- Allen tool M1 (for binding posts)
- jigs for the speaker (they are round atoms and need a jig)
- Amplifier (for sound testing)

PREPARE

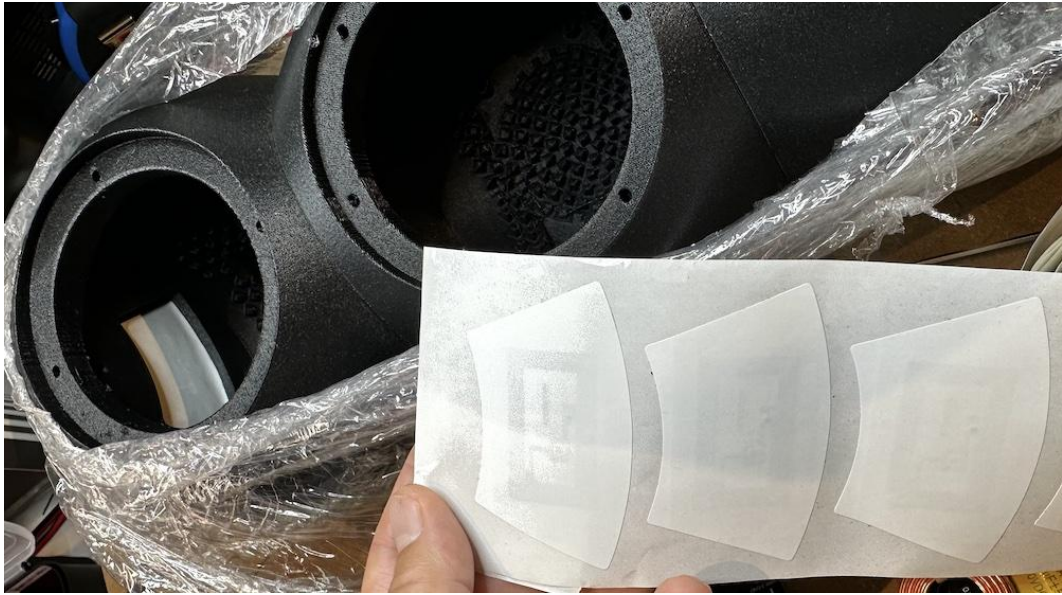


- The 3D printed casing should be ready and placed on the jig.
- Precut, presoldered Red-Black internal speaker cables should be ready in 200-300 and 400mm length
- Crossover PCB should be ready with components mounted.



Step by Step

1. Do not remove the plastic cover, it is there to protect the surface of the 3D printed casing from hot soldering tenn as well as protect it from scratched. Open up the plastic with a scissor or knife very carefully without touching the cabinet itself. Fold the plastic inwards to keep the driver openings free, but still cover most of the cabinet.
2. Remove a NFC tag carefully from the roll and insert the NFC tag in the slot visible on the inside top module of the speaker cabinet. The chip and glue side should be facing upwards and against the inside to stick neatly to the product.

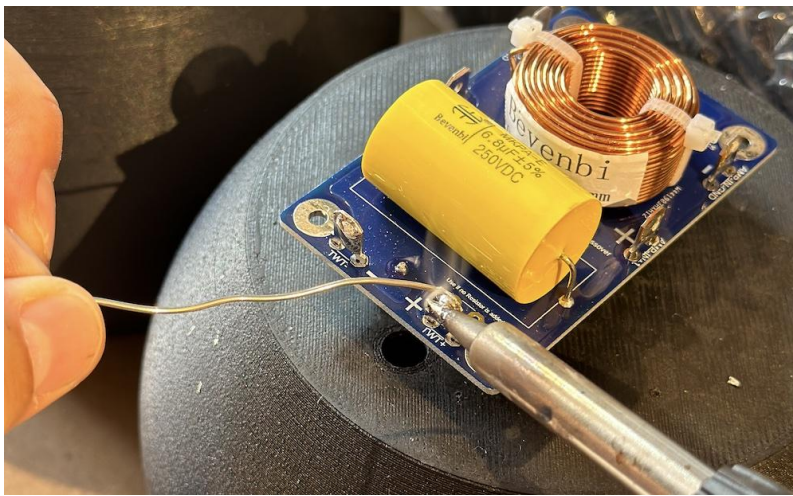


3. Program the NFC tag with the whatt.io APP. Choose Infinite acoustics as brand and program the tag as the correct Product. A GREEN OK button shows that it was successful. Test the NFC tag by tapping with any phone on the outside of the speaker to see that it is working.
4. Locate the thick white speaker cable that should be pre-cut to 820 mm, the article nr is CMPN0238. The text YYTCG SP-240XP with arrows shows the MINUS-GROUND cable. The other one is PLUS-positive. It is very important when soldering cables in the assembly to have correct plus-minus (red-black) cables, connectors, pcb and on drivers. Use the tool to remove the plastic protection and twin the copper.



Approx 10 mm of the copper wire should be visible. Solder the cables to prepare for being attached to the first PCB.

5. Push the white SP240-CMPN0238 cable through the center hole in the bottom of the speaker cabinet. It is easiest to push the cable from inside and out as the hole is smaller on the inside.
6. To prepare all crossover PCB's to be soldered to cables inside the speaker cabinet start with pre-solder all connection points that will be used in this application. refer to the mounting drawing for the Zirconium. All 3 PCB's can be pre-soldered and the four black selfthreaded screws with lock rings can also be mounted at this time.



Please use shorter screws for woofer crossovers and longer screws for the tweeter crossovers (as it has a power resistor attached on the back.)



Pre soldering makes it faster and easier later to solder the cables. In Zirconium both double pairs of woofers are attached in serial which means only WFR-1 is used. It is not needed to pre-solder ears for WFR2 as they are only used in a parallel application. All four soldering ear connectors for AMP IN and AMP out should be pre-soldered on the Woofer Crossovers. On the Tweeter crossover it is only needed to pre-solder the AMP-IN ears as it is at the end of the signal chain.

7. Use two ATOMS as support to be able to rest the PCB and later the drivers as the cables are quite short, it will help keeping the parts leveled with the opening of the speaker cabinets holes. Start with solder the white speaker to the PCB at AMP-IN. Be secure of plus and minus cable (minus have text). Be very careful and cautious in every solder, it is crucial for a perfect audio signal to be attached properly and an accurate soldering with enough heat will prevent a cold-solder that would be devastating for the audio signal. On the other hand don't overheat as this can harm the components on the PCB.



8. Next step is to unpack the 5 drivers. We need one Tweeter CMPN0013, two aluminium woofers CMPN0016 and two Carbon fiber drivers. Please handle with care and make an early inspection that they look perfect. The drivers are sensitive audio components and should be handled carefully. wear white gloves or keep hands clean and tidy. The magnets are also very strong so be secure that you keep them away from any metal, like screws... It is easy to pickup stuff that later will be inside the speaker, which is a bad thing. After unpacking the five drivers, bend the connectors a little so the points straight down, this will make it easier when mounting the drivers later. Pre-solder all connectors on the drivers to make the future steps faster and safer. Be careful with hot solder pen and tenn as a small hot drop can damage the drivers top surface...



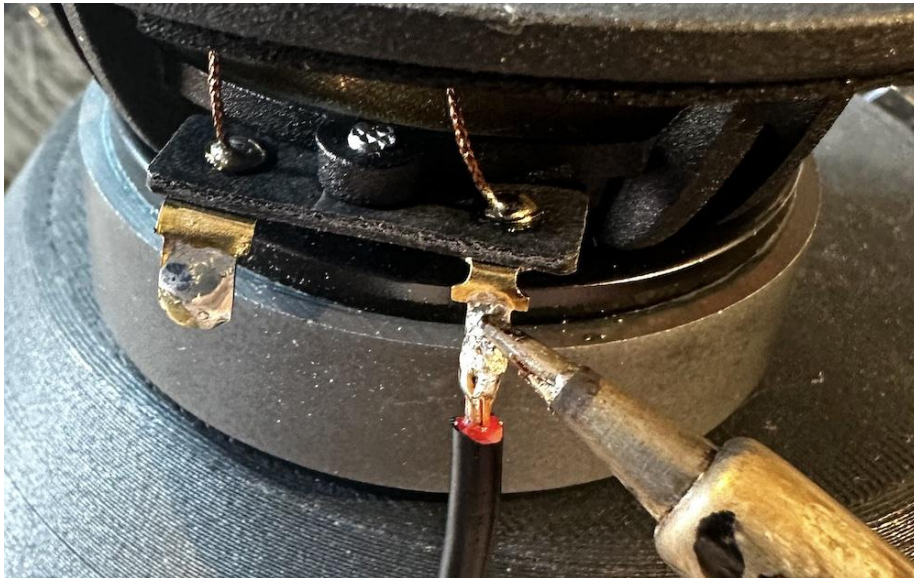
9. Next step is to start soldering the internal red-black cables and build the inside of the speaker starting from the bottom and go upwards. That means starting with the Croosover with the largest spool and the two Carbon fiber woofers. Again as you solder quite close to both the cabinet and the woofers, be careful with the solder, it is hot, 380 degrees and can damage both. Best is to work slowly and with no stress, step by step. Keep the precut red-black cables handy in 200-300 and 400 mm length. Have the assembly schema in front of you on the wall for instance for visual guidance. The PCB should be placed in the correct ATOM and in the right direction as the drawing shows. Take a 300 mm pair of cables (red-black) and solder to AMP-out (+ is RED and - is Black always)



A good process is to have solder material on the pen, start with heating up the tin on the ear and at the same time moving the cables pre tinned copper part into the floating tin on the ear. Tin has a tendency of very fast be float when

attached to other floating tin. This makes for a fast and accurate soldering process with no excessive heat added to the components.

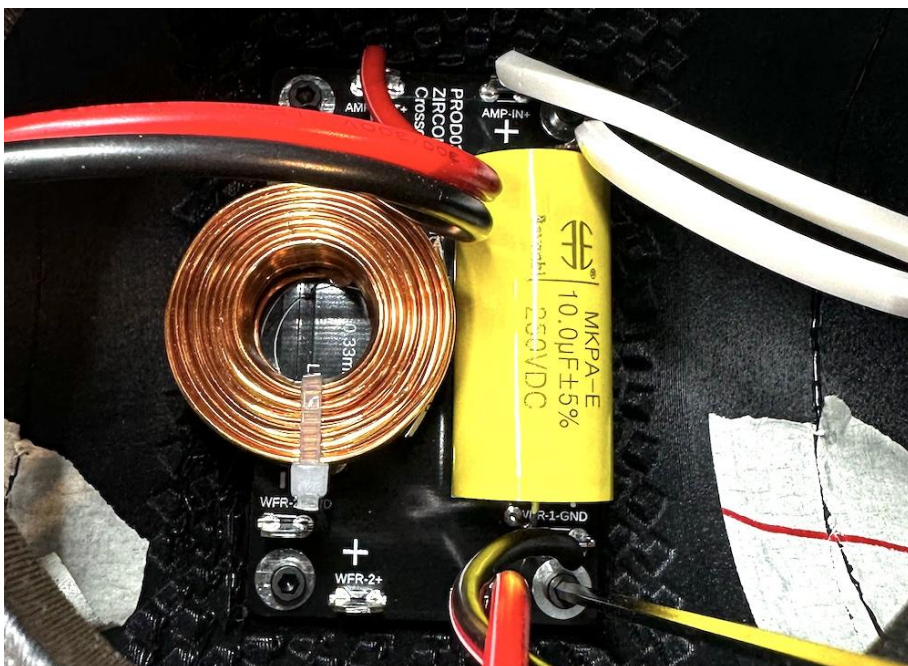
10. Add the cables for the first woofer in this order. Black 200 mm cable from WFR1- minus to the minus connection (always the thinner version on drivers) on the 1st lower carbon driver. It is important to solder the cable straight down, see image for a clean angle of the cable....



11. Solder the inbetween 200 mm cable (can be any color) between the NEGATIVE (-) connector on 2nd woofer driver and leave the other side of the cable hanging for now (it will later be connected to PLUS on the other lower woofer).
12. Solder a 300 mm RED cable from WFR1+ Plus connector on the crossover and leave the other side hanging from now. We do it this way so we can mount the crossover PCB inside the Cabinet with all cables soldered and attached. It is not possible to solder once the PCB is locked into place inside the cabinet... (too big risk in damaging other areas with a hot solder pen.)



13. Time to mount the PCB Crossover inside the Cabinet. Carefully insert the circuit board in the correct orientation, text should be readable as on the drawing. Use the long allen tool for 2.5M and position it correctly and fasten all four screws. Don't use more power than needed, use the moment that seems appropriate for the PCB to be safe and fasten properly, see to that all cables are running up and away from the PCB. Cables should be kept away from the COIL. The screws are self threading and should fasten nicely without any excessive force. No cables should run under the circuit board (PCB). Tighten all four screws crosswise with small forces. It is important that the PCB is fastened but don't apply too much force, then you can break the board or the case.



14. Time to place the first Woofer, the Carbon fiber lower one, but before we mount it in the cabinet the inbetween cable should be connected that runs from the 2nd woofer minus connector and be soldered to woofer 1 on the positive connector. As you see we run the two identical woofers in serial due to impedance issues. When that is done we will add sound damping wool covering the PCB and creating a damper for the back sound. The inner bumpy surface inside the atoms will help to attach the dampening wool firmly. A square 150x150 mm wool piece should be cut out and be placed in the cabinet between the PCB and the driver. Be sure to even out the wool and get it attached to the bumps inside.



15. Carefully push in the first Carbon fiber woofer in the hole of the cabinet. Please use good strong lights so you can position the driver correct for the 6 holes. It is very tight (for no air pressure to leak) so sometime it needs some careful love and pressure to mount it perfect. Only put pressure on the outer ring of the driver. Never touch the sensitive carbon material in the inner part of the driver, that can and will damage the woofer. The driver can be pushed in with some force also through the holes and you can use a little bit longer mounting screws to thread it down with the allen tool gently.



Add one or two screws at this point so it is firmly and correct mounted. There are three different lengths of the black driver mounting screws. The shorter version is the standard length and should be used in normal cases. The next length is 2 mm longer and can be used when the shorter one doesn't reach or in some special cases. The extra long version should be avoided. The Addnrite material is very strong and the rubber component in the material makes it sturdy and easy to thread down screws in, however too much force or too long screws can damage the cabinet and in worst case create a crack, which would be devastating for the whole speaker and that would be to start over with a new cabinet. It means very carefully add force to the T handled Allen tool and don't over do it.



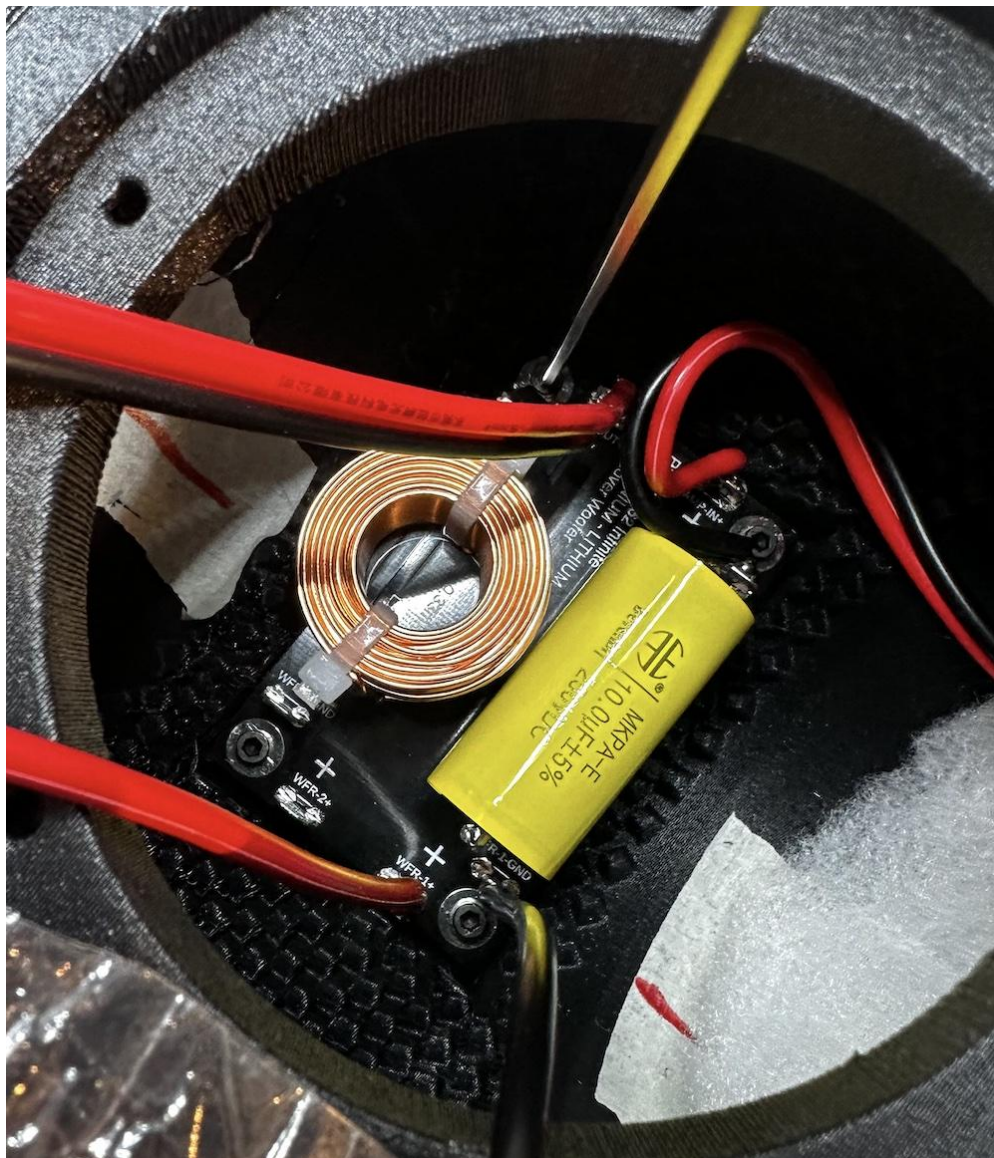
16. Add the 2nd Carbon woofer. Add the inbetween cable and the RED 300 mm cable that is coming from the Crossovers PLUS connector on the PCB. The speakers are running in serial remember. The AMP Out cable from the PCB should run underneath the dampening wool and be entering into the next section as it will later be connected to the 2nd PCB for the two Alu drivers. Add Dampening wool 150x150 (use a scissor to cut the wool) as for the other driver and mount the woofer carefully in the same way as above. Use one or two screws only at this point. We will add all six screws at the end of the assembly process.
17. Test point. We will now test what we have done so far. Just to be secure that all connections is done and that this part of the speaker works. It is not a full test, just a short functional test that the signal is going though the PCB and the two drivers are running. Connect the outgoing white speaker cable to a Amplifier and run some sound through it. It will sound dampened and lower spectrum of sound will only appear that is the way we want it to be. After this short test we can continue assembling the three other drivers, two Aluminium woofers in serial and finally the single silk dome tweeter on top. If no sound appears or it sound very strange, call supervisor to do a full check. dismounting of drivers and PCB will be needed to find the error.
18. Assembly of 2nd crossover and both Aluminium drivers. Very similar to the process above for the Carbon drivers. Start with soldering on a 400 red-black pair of cables to the AMP out ears of the PCB. These two cables will run below the damping wool up to the Tweeter casing and attach to AMP IN on the Tweeter crossover (but that is done at the end).



19. A black 200 mm cable soldered to MINUS connector to the lower of the two Aluminium Drivers. Other end solders on to WFR - minus on the PCB. See drawing for more detailed orientation.
20. A red 200 mm cable soldered to the WFR + PLUS and the leave it for later (it will be soldered to the PLUS of the 2nd Alu driver after montage of the 1st driver.



21. Connect the PCB to PCB cable that comes from Crossover one (AMP out) to the AMP IN (plus and minus) to this PCB for alu drivers. The cable can be quite short but it works if you gently lean the crossover on the plastic cover of the cabinet. See image.
22. Solder the black 200 mm cable from WFR- minus to the first Alu drivers ground (minus) As before the minus pole on drivers are always the smaller (thinner) one.
23. Mount the Crossover PCB inside the cabinet with the four screws. As before be gentle and dont use excessive force. No cables should run under the PCB and keep cables away from the coil (magnetic). Same procedure as the first PCB montage.



24. Before mounting the first Alu driver we need to attach the final cable to the positive pole of the driver. Use a 200 mm cable and solder to the driver. This cable will be connected to the other drivers minus pole (serial connection)



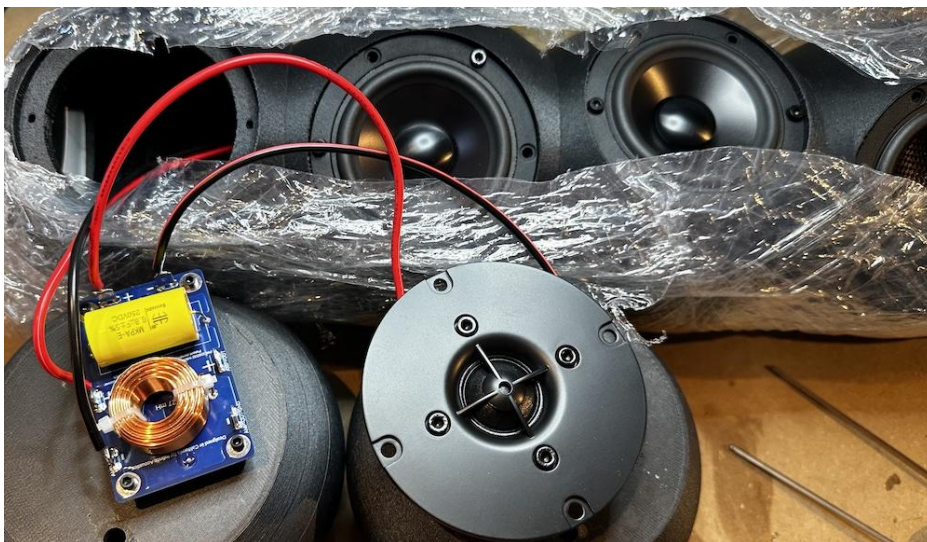
25. Add the damping wool, the same process as before and then mount the alu driver same process as above. It could be wise to add the two cables to the 2nd Alu driver and solder them before actually mounting the first alu driver with screws. Keep in control which is plus and minus. Very important so the two driver are connected in serial. If the driver makes resistant to be mounted, you can use a large screwdriver and gently knock down with some minor force from your hand. Dont use a hammer, it is tight but not that tight. Later add one or two screws to keep it in place. Remember that these are artisan pieces that are 3D printed in 100% recycled material, there might be some small inconsistencies.



26. Add damping wool to the last alu driver (4th all in all) and mount the final alu driver in the 2nd top hole of the cabinet. When done you should have two carbon and two alu drivers mounted and the AMP out red-black cable should be available in the final top mounting hole for the tweeter.



27. Add then final PCB with crossover for the Tweeter. This board have a power resistor on the back side of the board so it needs longer mounting screws that the other two board. Start with soldering red-black cables both positive and negative to the tweeter. Use 200 mm red-black cable pair. The cables have to be soldered on the Tweeter straight done as fitting in the cabinet is very tight.



28. Solder the other end of the Tweeter cables to TWT+ and TWT - as well as solder the inbetween cable in the cabinet to AMP IN + and -
29. Mount the Tweeter crossover PCB in the cabinet. Be sure to have all cables on the right side of the PCB and avoid running cables close to the coil.
30. Add damping wool and finally mount the Tweeter with all four screws. It is tight but gently push it in place.

31. Sound check. stage 2. This will be the second station for testing the speaker. So before adding the rest of the mounting screws we want to perform a quick test to see that all drivers perform and that it sounds correct. Connect to the test equipment and run the tests. If anything fails in this test, call your supervisor and start failure tests (potentially need to dismantle the speakers drivers).
32. Mount all the final black anodized screws, Be careful as before not to over tighten the screws. The material is very sturdy but you can crack it with too much force.
33. The ZIRCONIUM speaker is always mounted on a single metal stand. There are two options black low or high stand. Procedure is the same, but the first cables (WHITE) decides which stand it was aimed for. Low stand requires 820 mm cable. Push the speaker cable through the stand and then lift up the stand and the speaker atoms, rotate and push gently to slide it into place. It is quite exact measures but a gently turn and push will slide it into place.



34. Finally use a 1 mm Allen tool to loosen the binding posts stop screws and fasten the cables in the binding posts. Please again be careful with getting the poles right. Black post means ground-Minus and corresponds to the text on the white cable. No text goes to RED that is PLUS.



Excessive cable can be hidden into cross structure. It is possible to shorten the cable around 100 mm but be careful not to shorten too much as then a disassemble process have to be performed to exchange the inner cable. At Infinite Acoustics we strive to hide as much of the cables as possible, it makes assembly somewhat more challenging but very rewarding.



35. Dolby Atmos Music test and final control before packaging process.