

Installation-Instruction B-DAB-780 in Revox B780 (B739) Version 1.0

This document provides step-by-step instructions for installing the B-DAB-780 DAB+/FM retrofit kit for the Revox B780 receiver. The retrofit process for the B739 is similar. Please also note the prerequisites and optional steps.

Principle

The installation of the B-DAB-780 retrofit kit is fully reversible and can therefore be undone or removed later, if desired, without causing any permanent changes to the device. This means that no holes are drilled and no other visible changes are made to the housing.

Time requirement

For an experienced electronics technician, you can expect the installation of all components to take approximately 120 minutes, including opening and closing the unit, removing dust, cleaning the front panel and controls, and performing the final test.

Prerequisites

If the Revox B780 (B739) has been converted to DAB+/FM, not all components are used anymore; therefore, it is also possible to convert a unit that is slightly defective. The components listed below are **no longer** used and may therefore be defective. All other components continue to be used.

- 1.780.260 uC PCB
- 1.166.090 Dolby Dummy Plug
- Complete HF metal cage with all included assemblies
 - 1.780.151(.81) Frequency Synthesizer
 - 1.780.155 Meter /Deemphasis
 - 1.155.100 RF Front End
 - 1.166.120 IF Amp
 - 1.166.130 FM Demodulator
 - 1.155.150 Stereo Decoder

The battery compartment and battery voltage are no longer needed. Remove any batteries that may be inside.

Tools

- Various screwdrivers
- Hot glue gun (recommended)
- Plastic adhesive (not superglue)
- 1.5 mm Allen wrench for the volume knob
- Soldering iron
- Desoldering braid / desoldering pump
- Isopropyl alcohol and window cleaner
- Adhesive tape

In principle, the retrofit kit can be installed in the unit without overhauling it. However, to ensure that you can continue to enjoy your unit for many years to come, it's worth thoroughly overhauling all remaining components.

Important !

This product may only be installed by specialists who have in-depth knowledge of electronics. For laymen, the installation can usually not be accomplished in a compliant manner. In addition, the B780 will only function correctly with the technically correct procedure.

If you cannot fulfill the requirements below or you do not want to install the module yourself for other reasons, please contact Sumatronic AG or Lost Audio GmbH. You will receive a recommendation who can perform the installation for you.

Prerequisites:

- You are familiar with the handling of electronic components and assemblies and are particularly well versed in the subject of ESD (Electro Static Discharge).
- You have an appropriately equipped workplace and can thus ensure that the ESD specifications remain complied with.
- Among other things, they have the following tools at their disposal:
 - Soldering iron for electronic soldering work on printed circuit boards with ESD connection.
 - ESD work pad and wrist strap

Basic safety instructions

- Unplug the power cord and wait at least 10 minutes before starting your work.
- NEVER leave the opened device alone with the power cord plugged in, otherwise another person, or even yourself, could suffer life-threatening injuries.
- Read this manual and the safety instructions completely and do not connect the unit to the power supply until the manual tells you to do so.
- Any liability is excluded.
- Any warranty claim that may still exist for the device (e.g. after an overhaul or repair) may be voided by the installation. Because these devices have not been manufactured for many years, there is usually no longer any factory warranty.
- Do not touch any components on the circuit boards. Touch the circuit boards only at the edges.

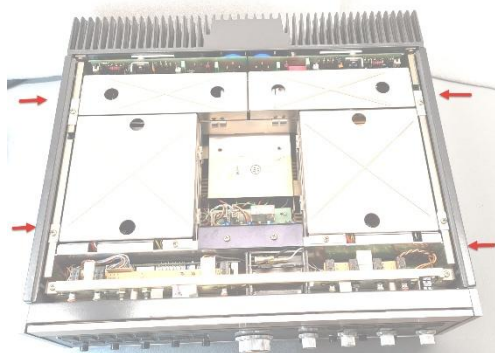


Opening the B780 and Removing Unused Components

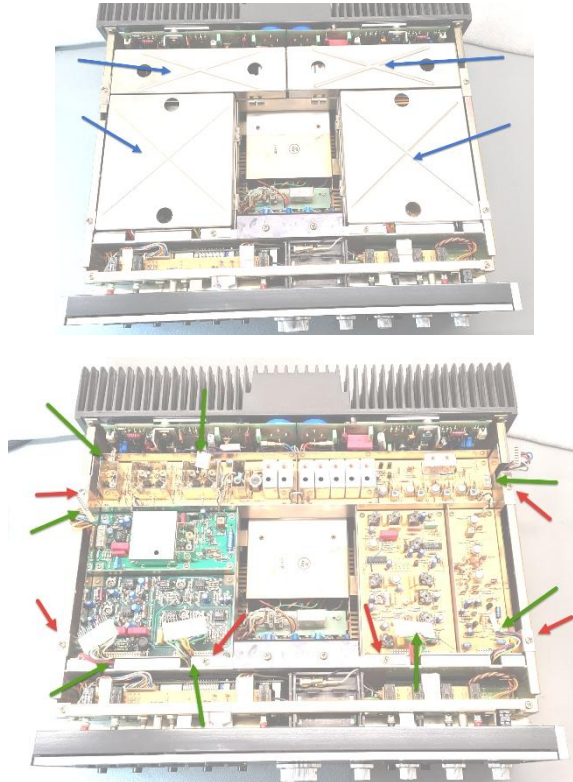
1. The modification is generally carried out in 3 steps. During the middle step (display modification), you'll need some space to perform the work while the device is open.
 - a. Removal of the components
 - b. Replacement of the display, display glass, display circuit board, and microprocessor circuit board
 - c. Installation of the new components
2. Before you begin work, familiarize yourself with the device if you are not already familiar with it. To do this, connect the device to a 230V AC power source and the speakers, and check the basic functions.
 - a. FM tuner static should be audible on both channels
 - b. Other connected devices (e.g., CD players) should play back via the AUX input
 - c. The input sources should be selectable
 - d. Buttons 1–10 should work
 - e. The center meter's backlight does not need to work; it will be replaced
3. The device must now be turned off and completely disconnected from all cables, especially the 230V power cord.
4. Place the B780 in front of you with the back facing forward and the feet pointing down. Now look at the B780 from the back, loosen the two screws at the top of the device (between the cooling fins), and then lift off the upper metal cover. The device will then be open at the top.



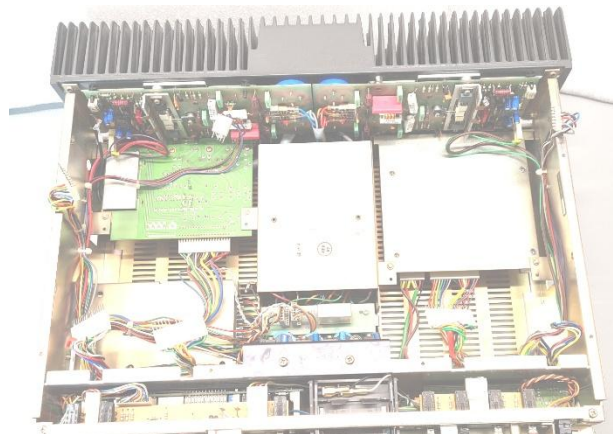
5. To prevent the device from getting scratched, remove the two side covers. Each is secured with two screws from the side.



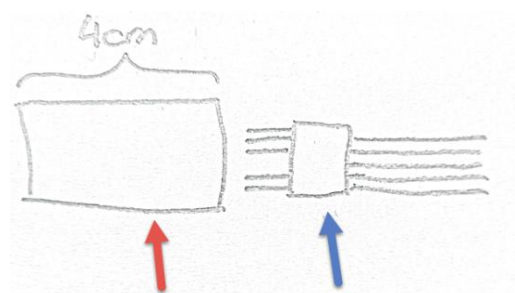
6. Now remove the 4 metal covers from the RF components (blue). Next, disconnect all the connectors (green) connected to them. Finally, remove the 6 screws (red) from the entire RF cage.



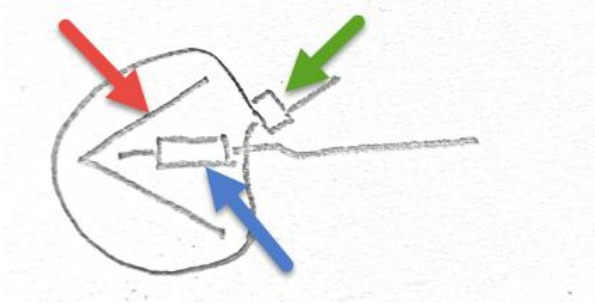
7. Now remove the entire RF cage by carefully lifting it out of the device. Be careful of the connectors on the loose cables, as they tend to get caught. These components in the RF cage are no longer needed.



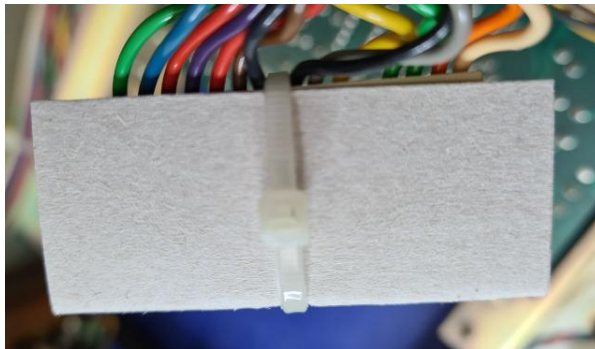
8. Now all the connectors must be insulated so that they cannot cause a short circuit anywhere. The easiest way to do this is as follows:
- Cut a strip (red) from a thin piece of cardboard—for example, from a pizza box or the packaging box for this conversion kit—that is 1 cm wider than the plugs (blue). The strip should be about 4 cm long.



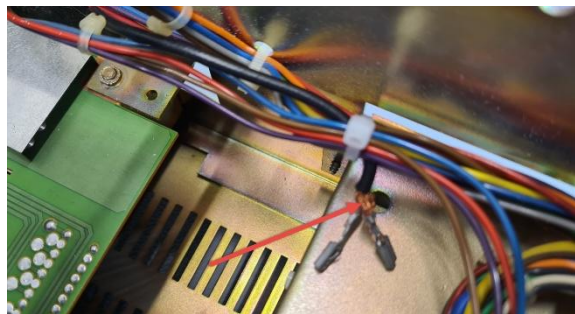
- b. Fold it in half
- c. Now wrap this piece of cardboard (red) around the front of the connector (blue) and secure it with the included cable ties. You'll need 1 cable tie (green) per connector. (This way, you can disassemble the tuner at any time.) Electrical tape leaves a lot of adhesive residue over time, which would be a problem here.



- d. Now do this with all the plugs.



- 9. Finally, secure the antenna cable together with the existing cables using a cable tie so that they cannot touch each other anywhere.



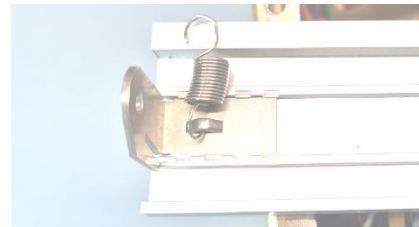
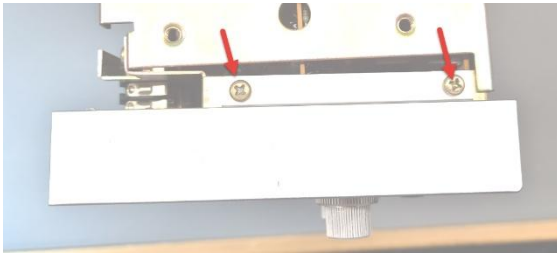
- 10. Now turn the device over so that it is resting on the open top.
- 11. Now use the 2 screws to remove the front foot or the foot rail



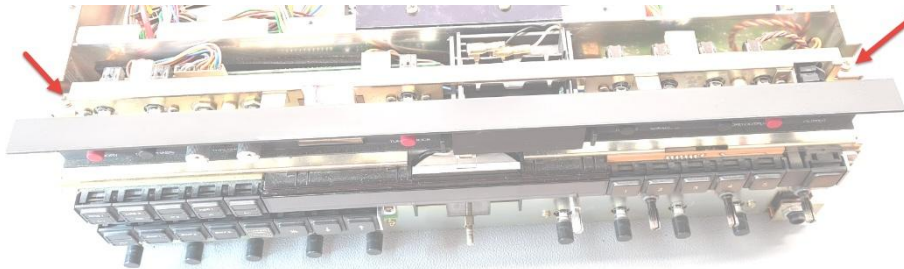
12. Now loosen the 5 screws and lift off the bottom cover so that the bottom of the device is now open as well.



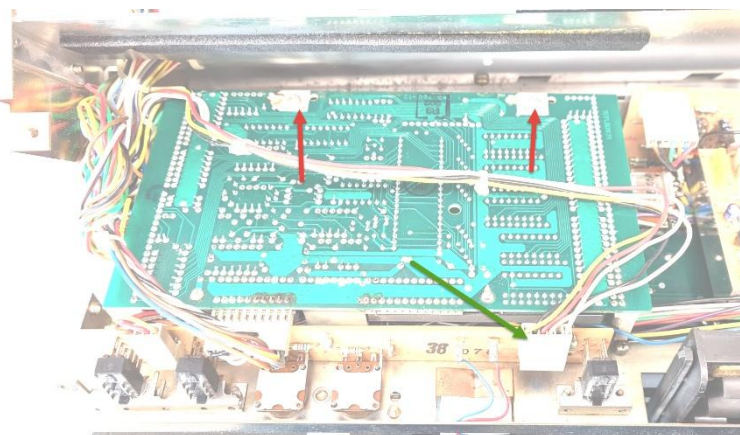
13. Now turn the device back over so that it is in its normal position again.
14. Now remove all the silver knob caps. The large cap on the volume potentiometer has a 1.5mm Allen set screw at the bottom (opposite the arrow) that must be loosened. Once this knob is removed, all the other knobs can also be removed.
15. Loosen the two screws on the left and right sides of the silver decorative trim strip. Then remove them. Be careful that the center cover flap at the top front doesn't just fall out. It is hooked onto this decorative trim strip with springs. Release the spring there. Set the decorative trim strip and the long cover flap aside. Be careful not to lose any springs. Now lift off the gray front panel as well. (At the beginning, take a look at how the spring is hooked onto both parts so that you can reinstall it correctly during reassembly.)



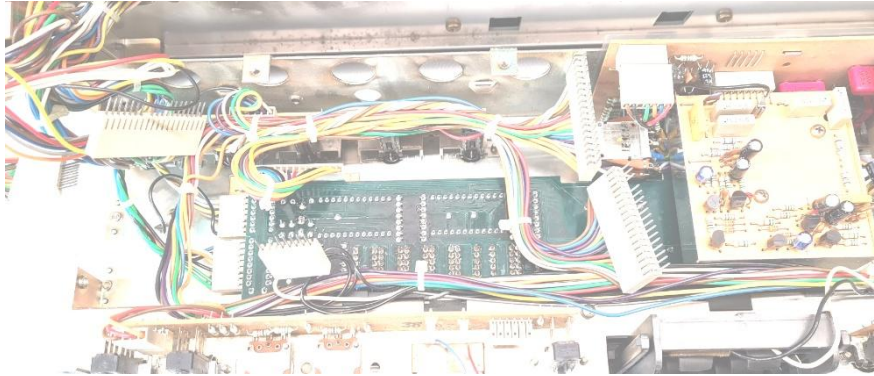
16. Now loosen the two screws that secure the front panel. Once they are loose, you can tilt the front panel forward.



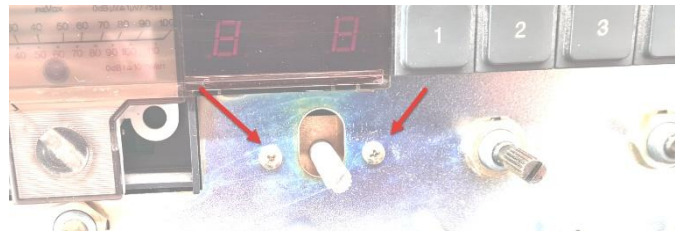
17. Now disconnect the plug (green) and the two screws (red)



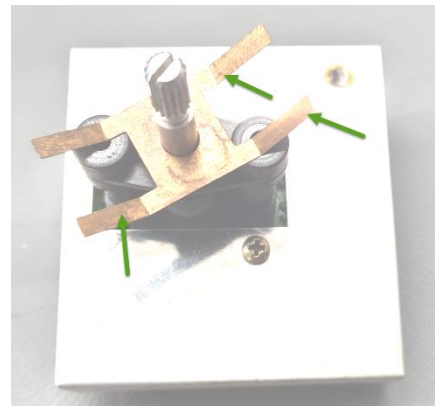
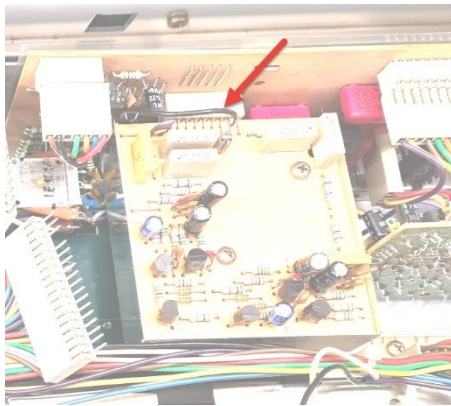
18. Carefully lift the microprocessor board, starting by disconnecting the connector plugged in from the top. Next, disconnect the small connector right next to it. Then disconnect the two large connectors on the right side. Lift these two out very carefully, and then disconnect the two long connectors on the left side as well. All connectors are keyed—that is, they have a notch—so they cannot be inserted the wrong way at the end.



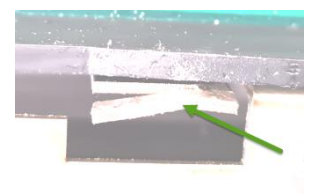
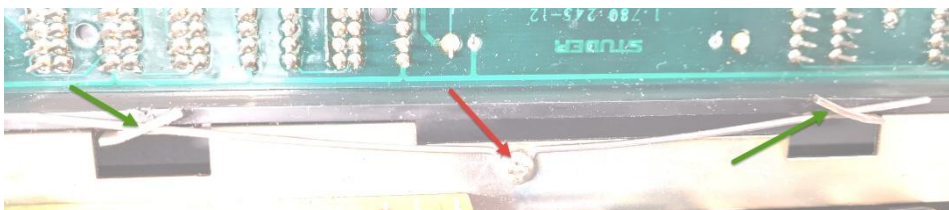
19. Now tilt the front panel back up so that it returns to its normal position. Next, loosen the two screws indicated by the red arrows next to the “Filter” switch. Then tilt the front panel back down.



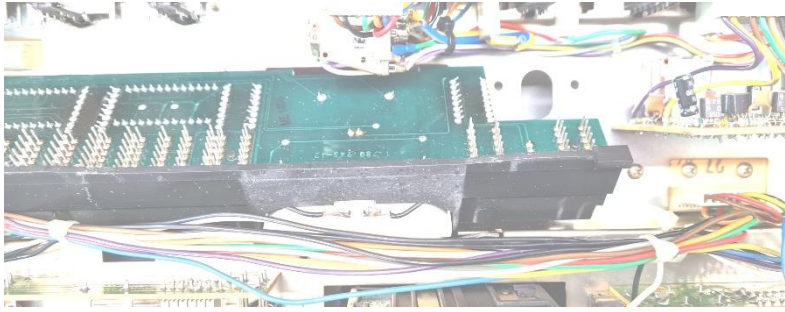
20. Now disconnect the entire filter assembly by pulling it out of the connector marked in red. The entire assembly is now attached only to this connector. Then lift it out and remove the ground spring (green) along with it.



21. Now, let's continue looking down at the tilted front panel from above. Loosen the screw marked in red, which secures a spring. Remove the spring, and then straighten the two tabs marked in green—or even bend them back a little further.



22. Now you can remove the entire display unit by carefully tilting it upward with the black plastic edge facing forward and then lifting it out.



23. Now tilt the front panel back up to its normal position and very carefully remove the Plexiglas cover from the display. You must proceed with extreme caution here, as the mounting hooks break off easily. Therefore, use your finger to gently push the mounting hooks from the back, alternating between them, until you can remove the display.

If one or the other breaks off anyway, it's not a big deal, since the Plexiglas will be held in place by the front once it's reinstalled. And two of these mounting hooks will have to be removed before installation anyway.

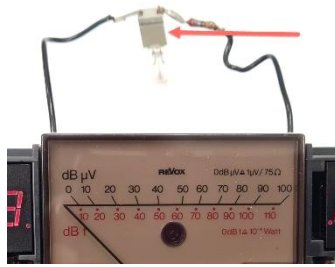
24. Remove the two red filters. They no longer fit the new display. New ones are included; when installing them, they must first be inserted into the plexiglass cover.



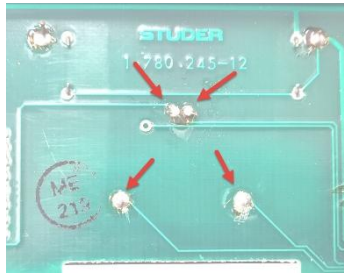
25. For the next few steps, you'll need some space and a soldering iron. So clear some space on your work surface.

Display Modification

1. You have now removed the old display board from the B780. Take the old and new display boards and transfer the signal meter from the old board to the new one. To do this, please follow the steps below exactly
2. Take the old display circuit board. Carefully remove the backlight from the signal meter by hand or with a pair of small needle-nose pliers.



3. Turn the circuit board over and desolder the 4 connections on the signal meter. The bottom two are for the signal meter, and the top two are for the stereo diode. Take special care with the stereo diode to ensure it does not fall into the signal meter. Now desolder these 4 solder joints and make sure that the diode's legs are still bent slightly outward so that the diode cannot fall into the signal meter. All 4 "legs" must be loose.



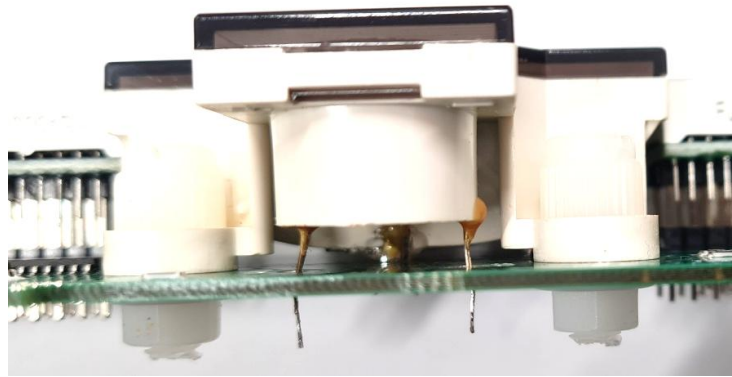
4. Turn the circuit board over and carefully pull the signal meter straight up from the top. Do not turn the signal meter over. You must always be able to see the pointer and the "dial."
5. Hold the diode in place with your fingers. Now check to see if the diode is still properly seated in the metal sleeve (as viewed from the front). If it isn't, you can reposition the diode correctly. Be careful not to rotate the diode in the hole, or the polarity will be incorrect. Now apply a small amount of hot glue or another adhesive that isn't too runny to the two marked spots so that the diode can no longer fall out or rotate.



6. Now straighten all the legs so that they would fit into the new circuit board.



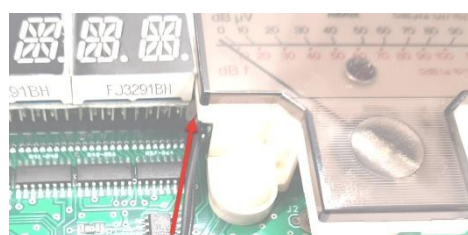
7. Now check to see how the meter would fit onto the new circuit board, and, to be on the safe side, double-check the polarity of the stereo diode in the signal meter and on the new circuit board. The positive terminal of the diode (anode) is marked with a + on the circuit board.
8. If everything looks right, insert the signal meter precisely into the corresponding slot. It's very tight and will probably get stuck a bit, but it fits perfectly into the slot. The holes for the connection pins are intentionally made very large so that you can insert it easily without damaging the pins.
9. Now secure the signal meter using the two included M5 plastic screws. Insert the screw from the top through the signal meter and then through the circuit board; then place the plastic nut on the screw from below. Now tighten this screw relatively firmly. Unlike metal screws, these plastic screws don't hold as tightly, but they can still withstand a fair amount of torque. Make sure the signal meter is aligned straight with the edge of the circuit board.



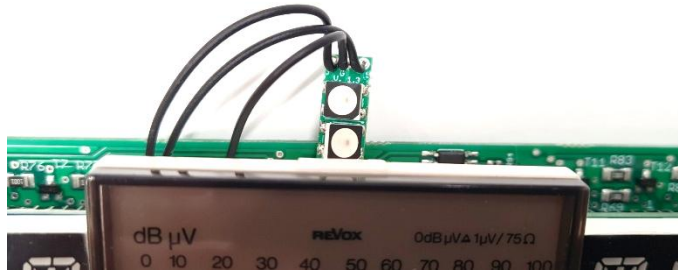
10. Now you can solder on the four legs. Since the holes are quite large, there's no need to fill them with solder; it's enough if the legs are neatly soldered to the edges.



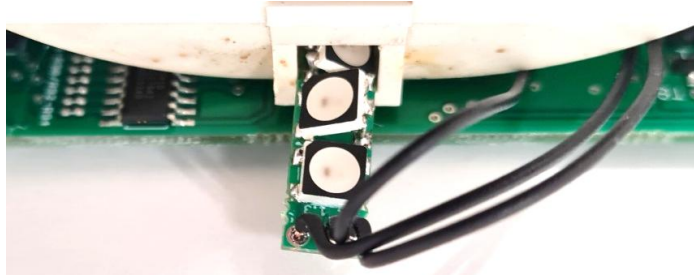
11. The signal meter is illuminated by an LED. Due to the extremely long service life of LEDs, it should no longer be necessary to replace this light source. I recommend using the LED and skipping this step. However, if you still wish to use a standard light bulb, this is still possible. Reinsert the original light bulb into the signal meter and connect it as follows:
 - a. Connect the wires to the empty terminals labeled "BULB-15V." You will need to extend the wires and route them properly. These terminals are located right next to the connection for the LEDs.
 - b. Remove the LED lighting. Desolder or cut the wires.
 - c. Install a series resistor in the designated slot "R125." 100 ohms is probably a good value. A resistor in the cable is no longer necessary. This resistor extends the life of the light bulb because it dims it slightly.
12. Now insert the light through the meter display.



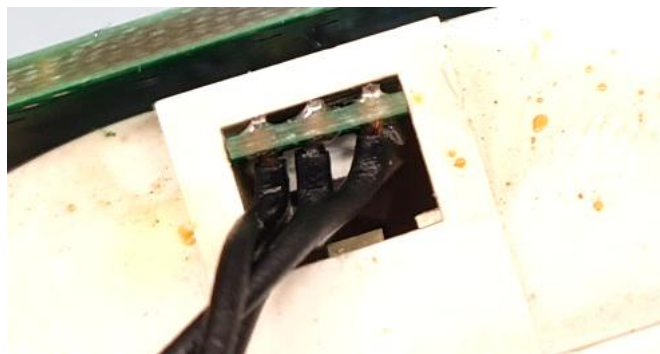
13. Then carefully insert them from above into the opening where the light bulb used to be. Please be very careful. Sometimes it takes several tries before they fit properly.



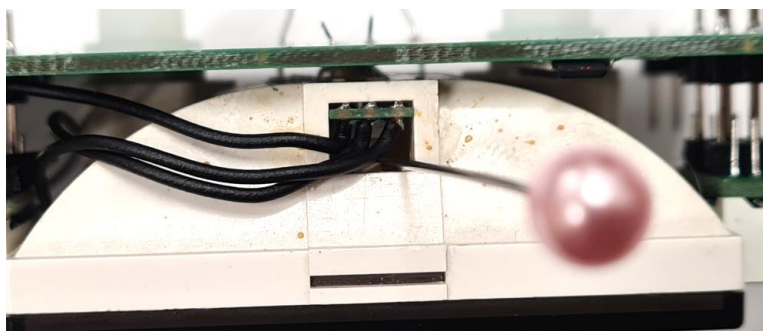
14. The LEDs are not soldered flat onto this circuit board; instead, one is soldered flat and two are oriented sideways. This results in slightly better illumination of the signal meter.



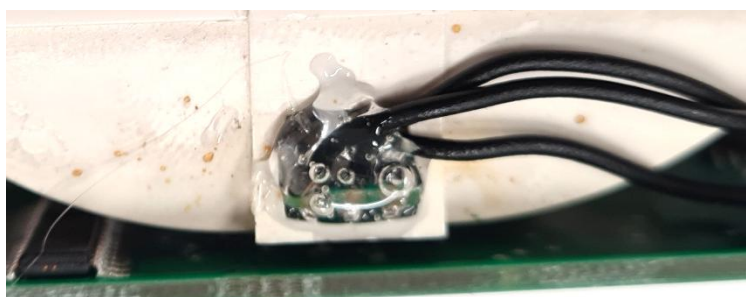
15. Insert the circuit board very carefully until it is fully seated.



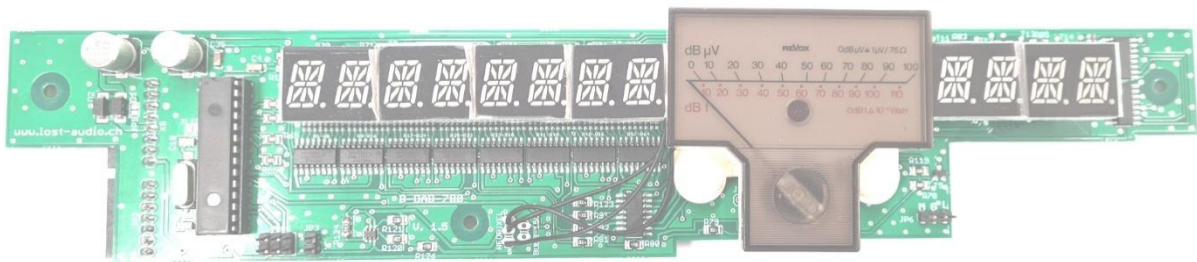
16. Use a small needle to align the circuit board so that, when viewed from above, it lies flat against the "bottom." This is the only way to ensure optimal illumination.



17. And then, when it's in the right position, secure it with a little hot glue. The glue should only adhere to the circuit board from the outside; do not squeeze any glue into the signal meter.



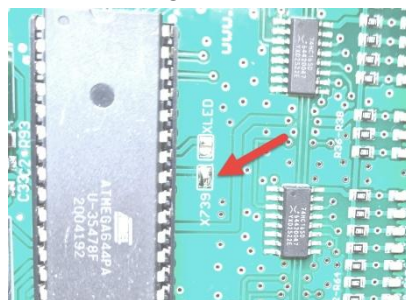
18. The circuit board is now ready for installation in the B780/B739



Note: Given the current design of the circuit board, a normally aged signal meter should be able to reach 100% modulation without any problems. However, if you find during your first test that the signal meter can no longer be modulated up to 100%, it has likely already been damaged by the heat from the tube. In that case, you can slightly reduce the value of resistor R124. The current value of approximately 12.3 kOhm can be reduced to 10 kOhm or 8.2 kOhm. However, only do this if it is absolutely necessary. Be sure to first check whether the pointer might be hitting something, such as the dial or the top of the viewing window. The pointers tend to bend downward or upward.

Modification of a Microprocessor Circuit Board

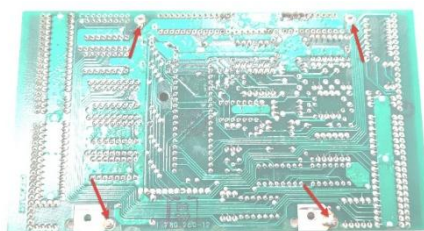
1. If you install the kit in a B739, you must now close solder jumper **X739** on the **microprocessor** board. It is located right next to the large processor.



2. Take the removed microprocessor board in your hand

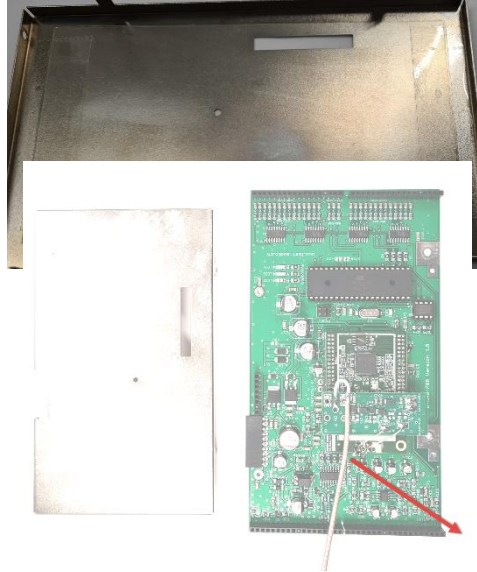


3. The shielding plate must now be transferred to the new microprocessor board. Desolder the 4 solder joints where the shielding plate is attached.

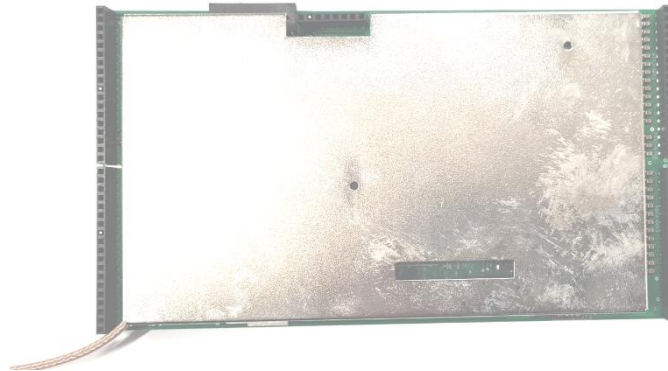


4. Then carefully lift the sheet metal; once the solder joints have been thoroughly desoldered, the sheet metal can be removed without much effort.
5. Clean the inside of the tray with a little alcohol

6. Now place the included plastic sheet in the center of this shielding plate on the inside and secure it with two strips of tape. This provides insulation so that the top wires of the new microprocessor board cannot come into contact with the shielding plate.



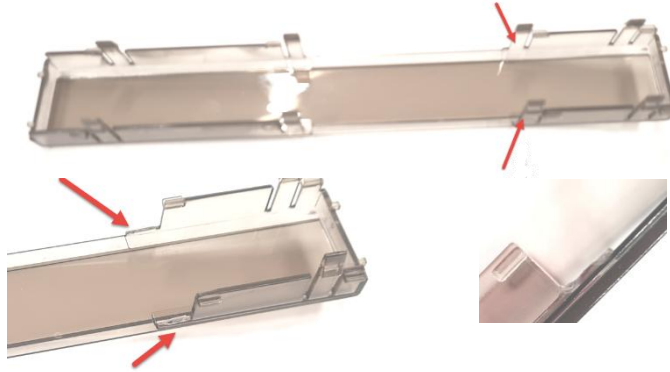
7. Now place this shielding plate on the new microprocessor board. The mounting holes align exactly with the 4 solder tabs. Make sure the antenna cable is routed exactly as indicated by the red arrow. Once soldered, the antenna cable cannot be repositioned, so it must be routed correctly during the soldering process.
8. Next, solder the 4 solder tabs on the shielding plate. When you're done, the microprocessor board should look like the image below.



9. If your B739/B780 is equipped with an antenna rotor control unit, this connector is no longer connected. The new hardware no longer includes an antenna rotor control unit. Any such connector must be isolated as described above.

Plexiglass Display Modification

1. You'll now need to snap off two of these mounting hooks from the display glass. On the side with the smaller display, you'll need to snap off both hooks, since the signal meter requires about 2 mm of space there. The display will still hold securely because it is clamped into the aluminum front panel. Snap them off with your fingers. Afterward, you'll need to straighten out the break. You can do this with a very sharp side-cutting pliers, a knife, or a file. However, always be careful not to scratch the display.



2. First, practice inserting the red sheets into the display. The sheets rest on the tab and are glued in place there.
3. Now you need to clean the display, preferably with a mild window cleaner.
4. Once the display is dry, position the two red films in the two corners and glue them in place. Use a plastic adhesive and allow it to dry completely before continuing. Superglue has the disadvantage of often leaving a whitish film on adjacent parts, and mistakes cannot be corrected. Based on my own experience, I therefore advise against using superglue. Now remove the protective film from **both** sides of the two red films.
5. Now place some glue somewhere—for example, on a strip of paper. Squeeze a small amount onto the strip of paper. Dip a size 0 screwdriver into it so that there is just a tiny bit of adhesive on the screwdriver. Then apply it to the edge of the display where the film should adhere. Refer to the green dots. Four small dots with just a tiny bit of adhesive are sufficient.
6. Now position the red film all the way into the corners of the display and hold it firmly in place for a moment. It should not be bent or creased when you apply the adhesive. It rests on the tabs where the adhesive has been applied.

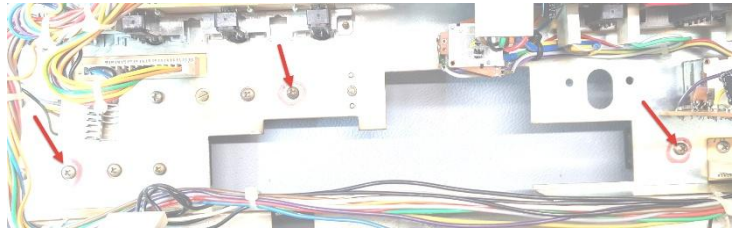


7. Now repeat this step on the other side. Make sure that the display doesn't get smudged with adhesive or that there are no fingerprints on the inside that you won't be able to clean off.
8. The Plexiglas should now look like this. Let it dry for the amount of time specified by the adhesive manufacturer.

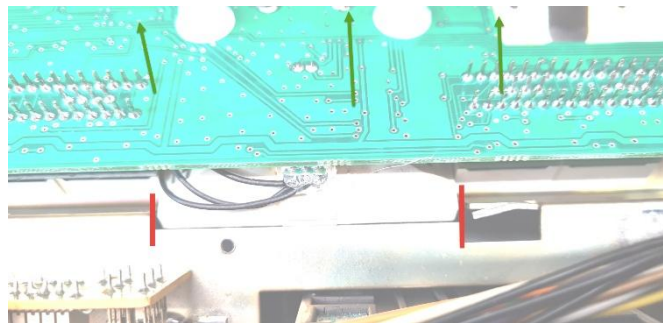


Installation of the new components

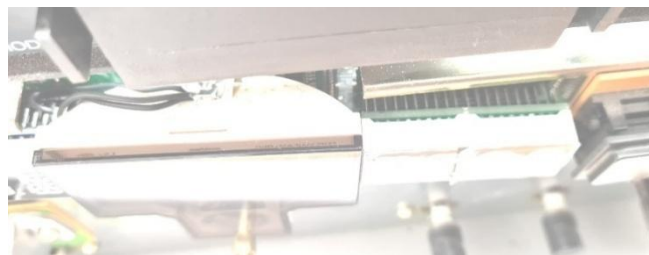
1. First, remove the following 3 screws marked in red. The new display is then secured in place with a new screw.



2. Now insert the new display circuit board. Again, do this with the utmost care. If everything is positioned correctly, it will slide into place without any force. Tilt the display back into place. This means that on the long side near the volume potentiometer (green arrow), the circuit board is initially close to the metal plate and is then carefully tilted into place. The signal meter must fit exactly into the cutout in the metal plate (red mark). Therefore, tilt the board downward so that it passes precisely through the cutout. You cannot install it flush just yet. As soon as the pointer instrument has passed through the cutout, put the front panel back in place. Now use both hands—one from the front and one from the back—to ensure that the pointer instrument fits all the way through the cutout toward the front.

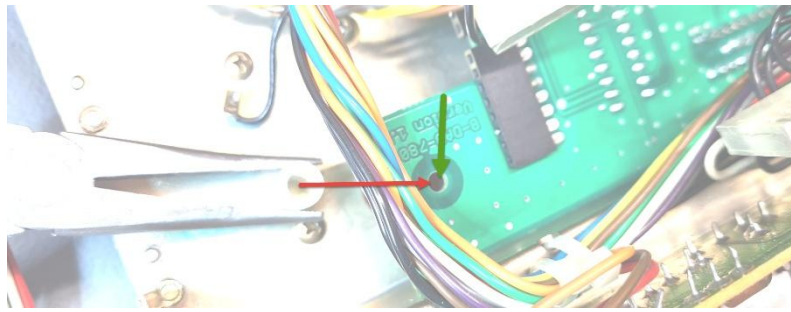


3. Now slide the circuit board to the right toward the power switch so that the analog gauge is in front of the metal plate (see picture).
You can now move the circuit board closer to the metal plate from the back, because the first red segment display on the left now fits through the opening as well. You can now align the circuit board properly.
4. The signal meter is now slightly to the right of the recess (note the red mark). Once the screws are tightened, the circuit board will be properly aligned.

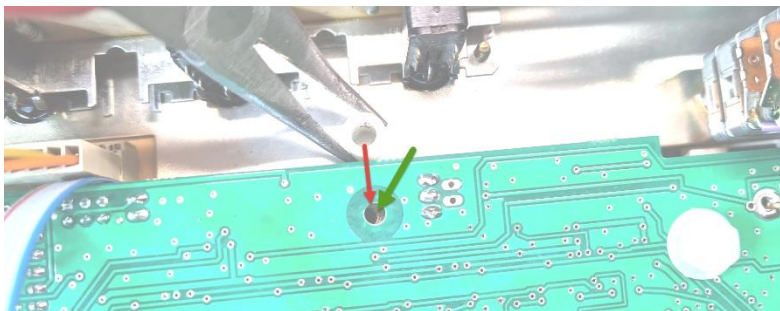


5. The signal meter is no longer exactly centered, but 2–3 millimeters to the right of center. This is normal and will remain that way. It isn't noticeable during everyday use.

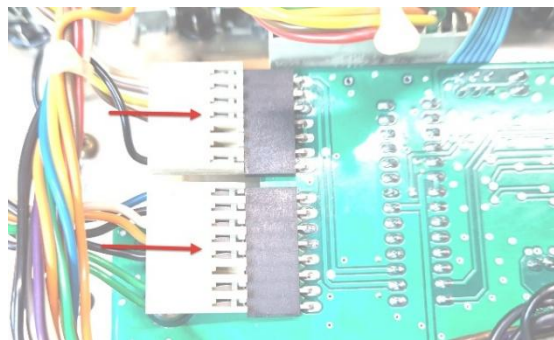
6. Now lower the front panel back down. Take the 3 new long screws. Now place each of the 12-mm spacers exactly under the screw hole (red arrow). Then carefully press the circuit board down so that the plastic doesn't slip. Next, insert the first screw (green arrow) and tighten it slightly so that it doesn't fall out, but the circuit board is still very loose. Do this first on the left side of the display.



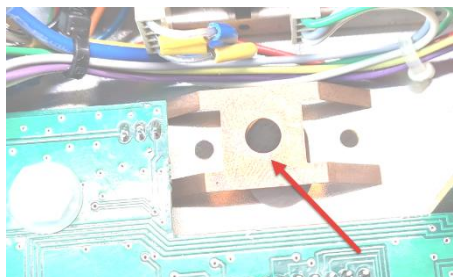
7. Now repeat the same step for the middle screw.



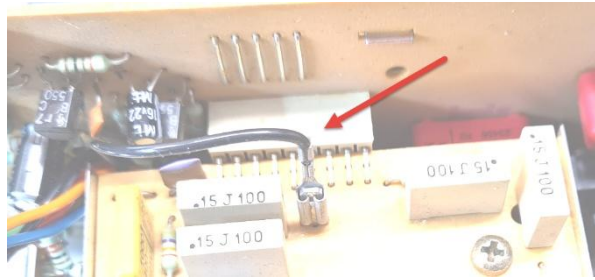
8. And finally, on the right side. The connector gets in the way on the right side during this task. Unplug it briefly, secure the display, and plug it back in right away.
9. Now carefully tighten all the screws, just enough to hold the display in place. Since no force will be applied to it later, the screws do not need to be tightened very tightly.
10. Now connect the two connectors from the display board to this new board. Be sure to pay attention to the keying pins—that is, the missing pins—which must align with the occupied holes.



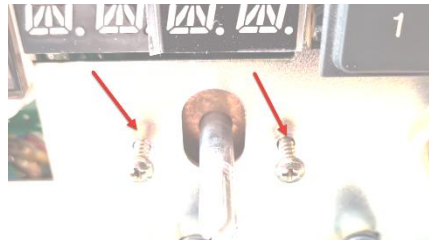
11. Now the filter circuit must be reinserted. To do this, first place the ground spring exactly over the hole.



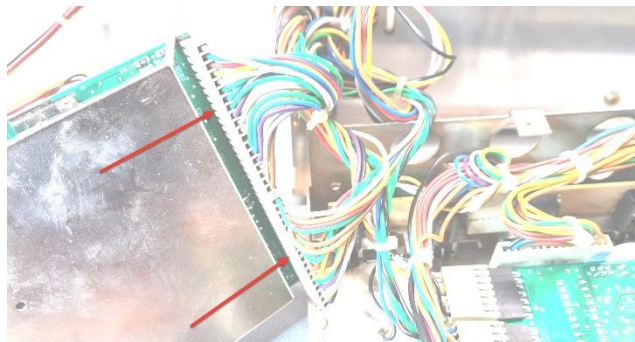
12. Now insert the filter circuit. Make sure the ground spring fits snugly into the hole and doesn't twist too much. The filter circuit is now plugged back into this jack.



13. Reattach the filter assembly from the front using the two long screws. To do this, you'll need to prop up the front panel briefly.



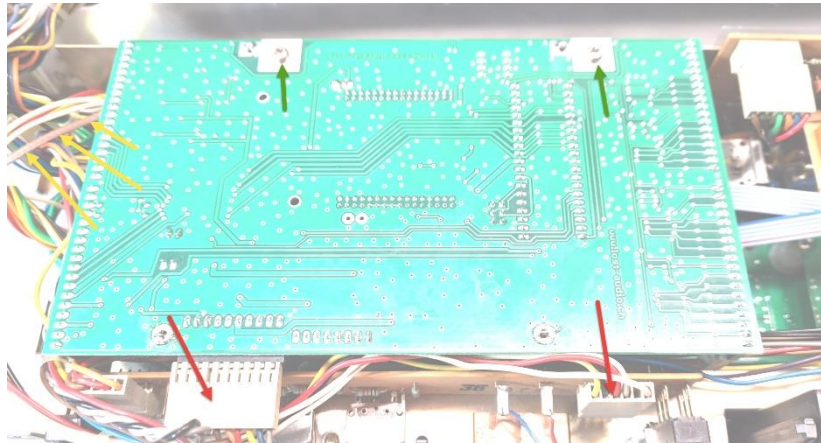
14. Now it's time to install the new microprocessor board. First, plug in the two connectors on the left side. Make sure the cables are routed neatly so that everything fits together properly in the end.



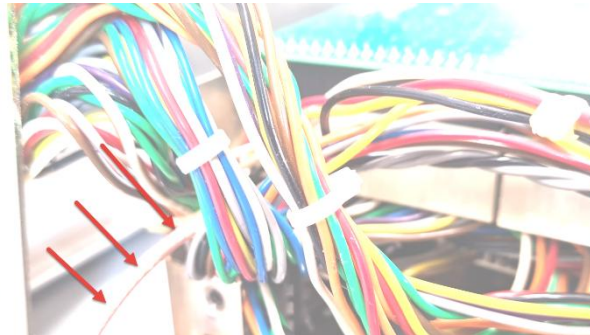
15. Now plug in the two large connectors on the right side. Then plug in the connector from the bottom.



16. Now position the circuit board correctly so that it can be secured again with the screws (green). Make sure the antenna cable (yellow) is properly routed and isn't pinched or kinked anywhere. Then reconnect the two connectors (red)—one to the microprocessor board and one to the circuit board on top of it.



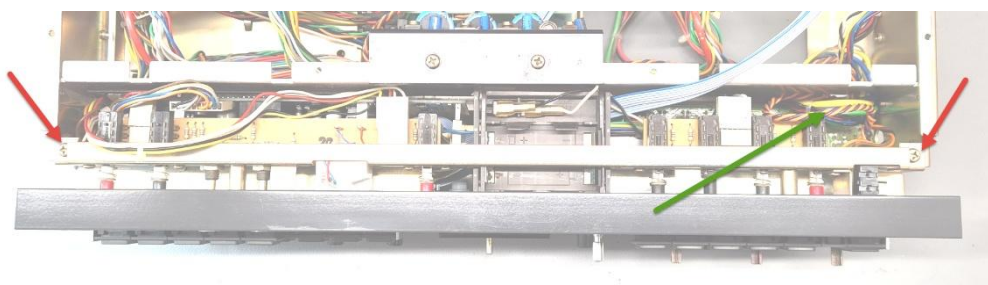
17. The antenna cable should run neatly out of the wiring harness on the side



18. Now thread the antenna cable through the opening in the lower-left corner.

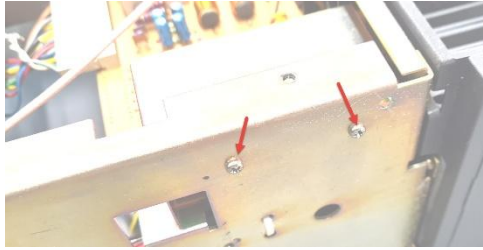


19. Now reinsert the front panel correctly into the device and secure it with the two screws (red) from above. Make sure the cables are neatly routed into the wiring harness on the left; they should fit without any force. On the right, the cables usually need to be lowered so that the thick part of the cables (green) lies below the circuit board.

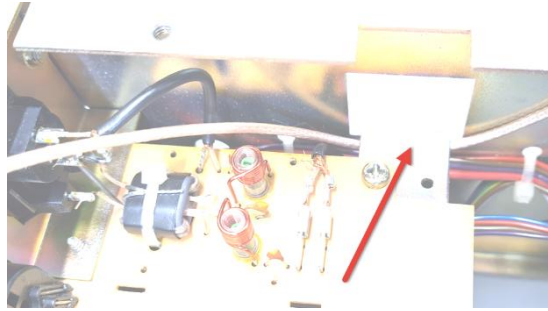


20. Ignore the visible gray ribbon cables; they are not actually present in your device.

21. Now turn the device over so that the antenna cable can be routed.
22. Use the two screws to remove the cover over the antenna jack



23. Now route the antenna cable neatly all the way to the antenna jack. At the red arrow, the antenna cable is routed back up to the antenna jack, passing underneath this mounting bracket.



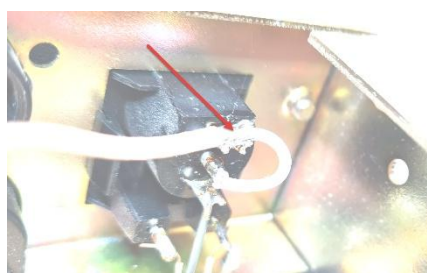
24. Then unsolder the original antenna cable and secure it to the circuit board with a cable tie so that it cannot cause a short circuit.



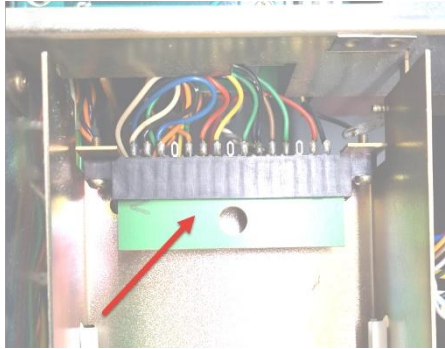
25. Now solder the new antenna cable in the middle first. Heat the center metal sleeve, and then slide the core of the antenna cable into it.



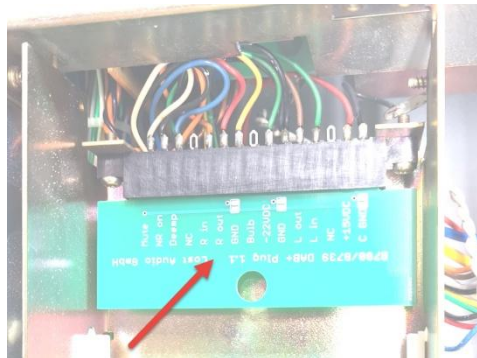
26. Then carefully bend the cable around and solder the ground shield to the ground pin.



27. Now replace the cover and secure it with the two screws.
28. Now look inside the Dolby expansion slot and pull out this small circuit board.



29. Insert the new circuit board into this slot. The label must be visible as shown in the picture.

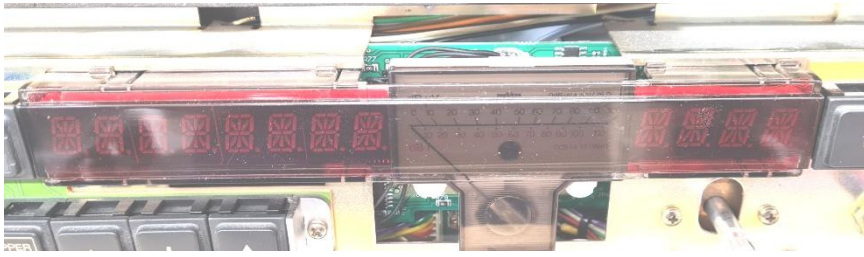


30. Now turn the device back to its normal position so that you can look at the front from the front. When you look at the display from the front, you'll see that a protective film is attached to each display element. Now is the time to remove them.



31. Now you can perform an initial functional test. Be careful—the device is connected to 230V, which could cause injury. You must know what you're doing! Use the two speaker switches to turn off both speaker groups, A and B, and turn the volume knob to 0. The device can now be connected to speakers, a DAB antenna, and the 230V power supply.
32. Turn on the device. The signal meter should light up yellow; the display will first show the startup logo and then go dark. The right display will show "DAB." You can now program and test the device according to the user manual before reassembling everything.

33. Once you've tested everything, the first thing to do is carefully reinstall the display glass.



34. Now the aluminum front panel is installed



35. Now it's time to install the silver side trim strips. Start with the left one and hook it right into the long cover flap. First, tighten only one screw—the top one—and make sure the long cover flap doesn't fall out. If it does, just hook it back in right away. It is assembled as shown in the picture.



36. Next, lift the long flap slightly forward, hook the right trim strip into the spring and then into the flap, and insert the trim strip. Then, start by inserting only the top screw. Check that the trim strips are properly seated and that the long bath cover flap is correctly installed and can be opened and closed. If everything is correct, tighten the screws and then insert the lower ones as well.

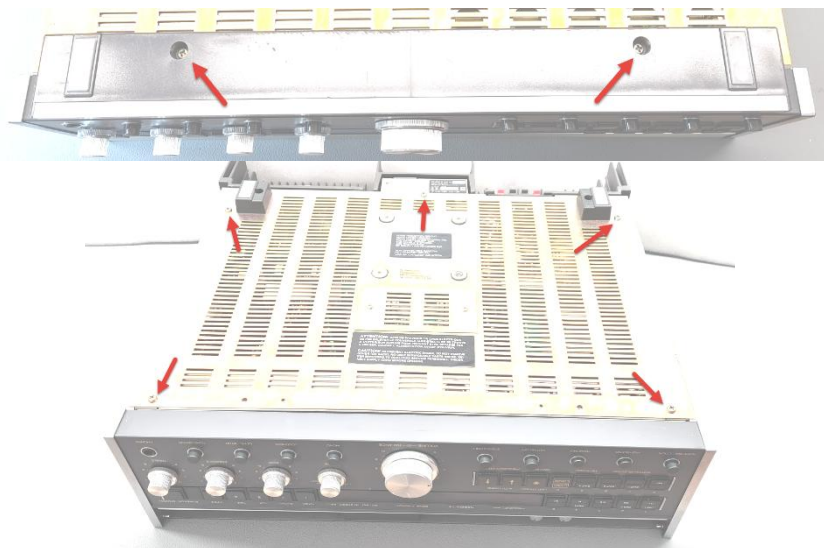


37. Now insert the knobs. Turn all the controls except the balance control all the way to the left; this will make it easier to align the knobs, since the arrow should then point exactly to the left end. The balance control should have the flat side facing up, so you can insert this knob with the arrow pointing up right away. Finally, install the volume knob. First, insert the 1.5mm Allen wrench into the set screw, then insert the knob and tighten the set screw.



38. Turn the unit back over so that the bottom is facing up. Place the base plate back on top and secure it with the 5 screws.

39. Replace the front baseboard and secure it with the two slightly longer screws.



40. Turn the device back over so that it is now standing on its feet. Now reattach the two side covers on the left and right, securing each with 2 screws.
41. Replace the unit's cover and secure it with the 2 screws. Insert the screws from the outside, into the second slot, starting from the cooling fins.
42. The conversion is now complete. Test the device thoroughly according to the user manual.
43. Connect the 230V power supply, the antenna, and the speakers. Turn the volume control to 0. Turn on the device and enjoy the new DAB+ and FM reception.