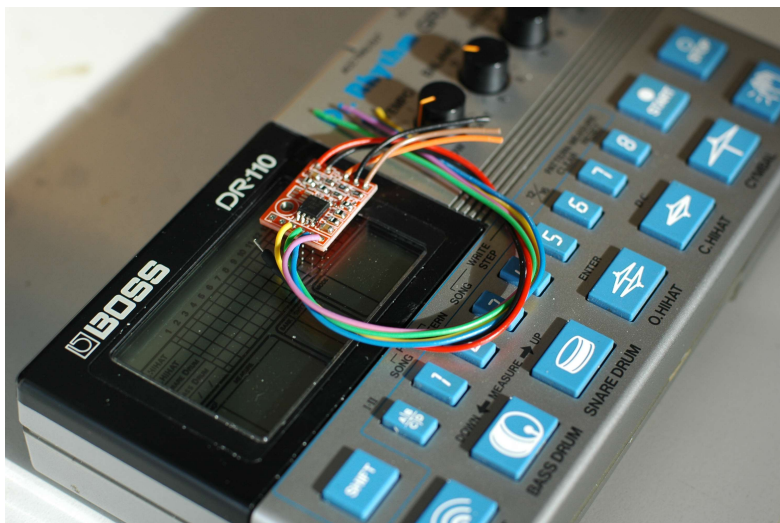


# Boss DR-110

$\mu$ Sync installation guide  
version 1.0, 27 september 2016



[www.artefacts.nl](http://www.artefacts.nl)

## **Introduction**

The Boss Dr-110 has no standard din sync input. Artefacts developed a piece of hardware to convert a standard 24ppqn DIN sync signal to the needed clock, start and stop signals to get the DR-110 running in sync. If no external din sync signal is present the Dr-110 uses it's internal clock and start/stop circuitry. The  $\mu$ Sync switches to the DIN Sync input as soon as a master start is detected on the DIN sync input. So no need for switches to switch between internal and external clock. The current consumption is only 1,5mA.

## **Before you start**

Before you buy and install this kit make sure you have the needed skills and tools to perform this modification and the DR-110 is fully functional. Although it is a simple modification it is important to read and follow the instructions.

Skills you need:

- basic metal working skills
- basic soldering skills

Tools you need:

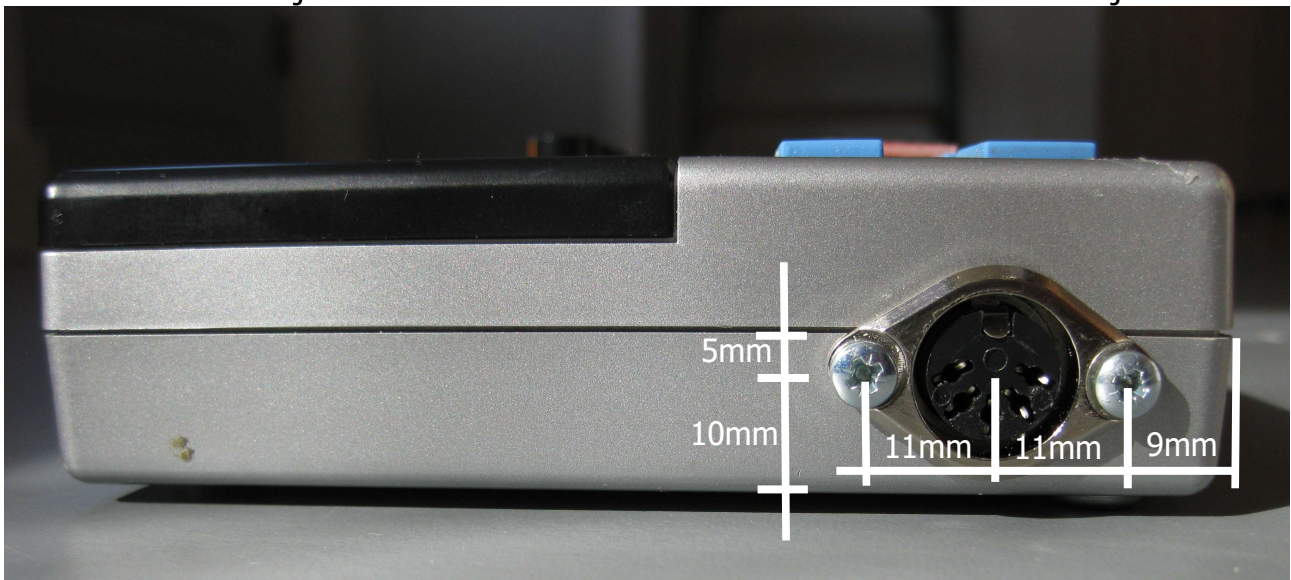
- hand held drill or drill press
- a 3mm drill bit
- a 16mm hole saw or a step drill bit or drill bits in various sizes up to 10mm
- Digital multi meter(DMM)
- soldering iron
- solder wick, de-soldering pump or de-soldering iron
- screwdriver philips #2
- screwdriver pozidriv #1
- heat gun
- transparent tape

## Opening the DR-110 and getting ready for installation.

Before you start make sure the DR-110 is fully functional. To install the din socket a large hole has to be drilled in the left hand side. This is a tricky job because the hole is in both the lower and the upper part of the DR-110 case. The plastic has become brittle over time and you have to be careful not to damage the enclosure or battery compartment on the inside. Keep the unit closed and make sure the screws are tightened. I stick some transparent tape on the area I will be working on, this protects the case from scratches or marks while drilling. Mark the position of the holes, see picture 1.

If you have a 16mm hole saw drill the pilot hole in the right position and use the hole saw at very **low speed**. If you have a step drill bit you can not use it up to the end size because the tip will touch the battery compartment. With normal drill bits you have to be **extremely careful not to crack the case!!!** Best is to drill the holes to a size of about 10mm and than use a round file to make the hole the needed size(15,5mm). Then fit the din socket and drill the 3mm mounting holes. Do not screw the DIN-socket into place yet.

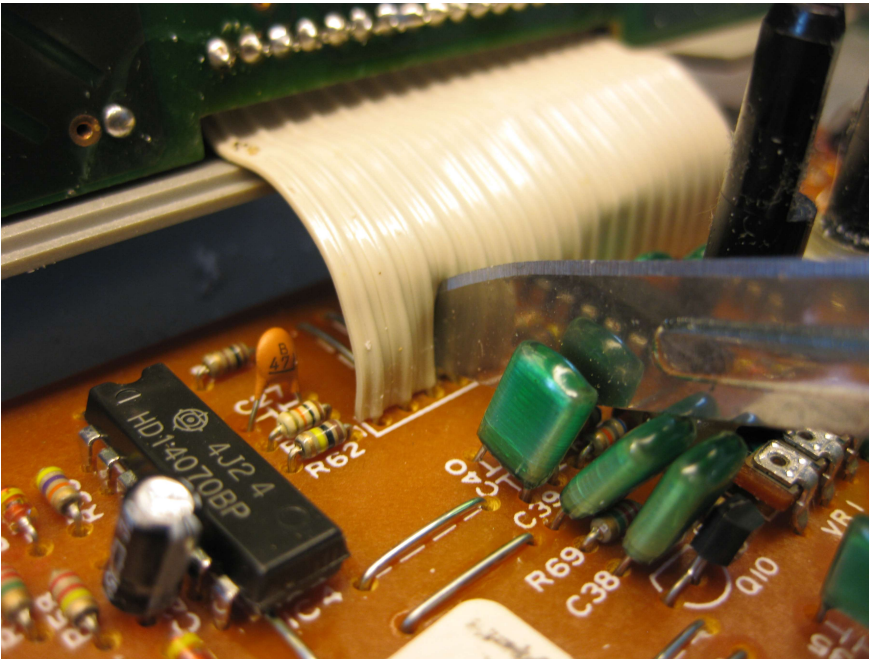
If you don't want to drill the large hole in your DR-110 you might consider to use a stereo mini jack and make a dedicated cable from Din to mini-jack.



*Picture 1, the location of the DIN-socket.*

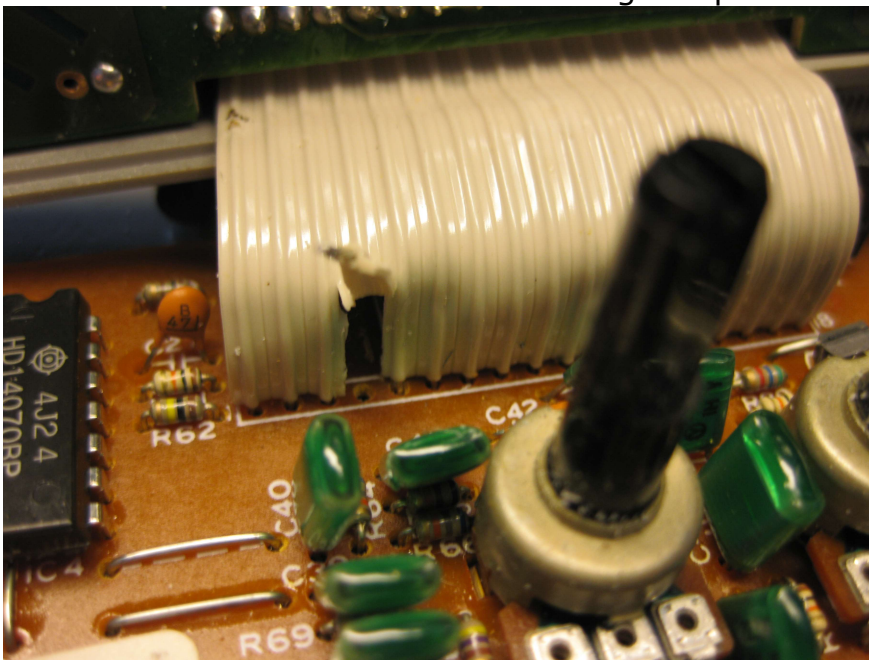
Open the case of the DR-110 by removing the 3 screws in the bottom, lift the back side and slide the case gently open(it has some "hooks" on the front side of the case).

Locate pin 4 on the ribbon cable, see the picture 2 for details. Use a sharp knife to make a small cut on both side of wire 4, the length of the cuts should be approximately 1,5 centimeter.



*Picture 2, cutting the ribbon cable.*

Desolder the wire from the bottom side of the voice board and remove the wire from it's hole. It should look something like picture 3.



*Picture 3, the ribbon cable removed.*

### **Installing the DIN socket.**

Solder the brown, black and orange wire to the din socket.

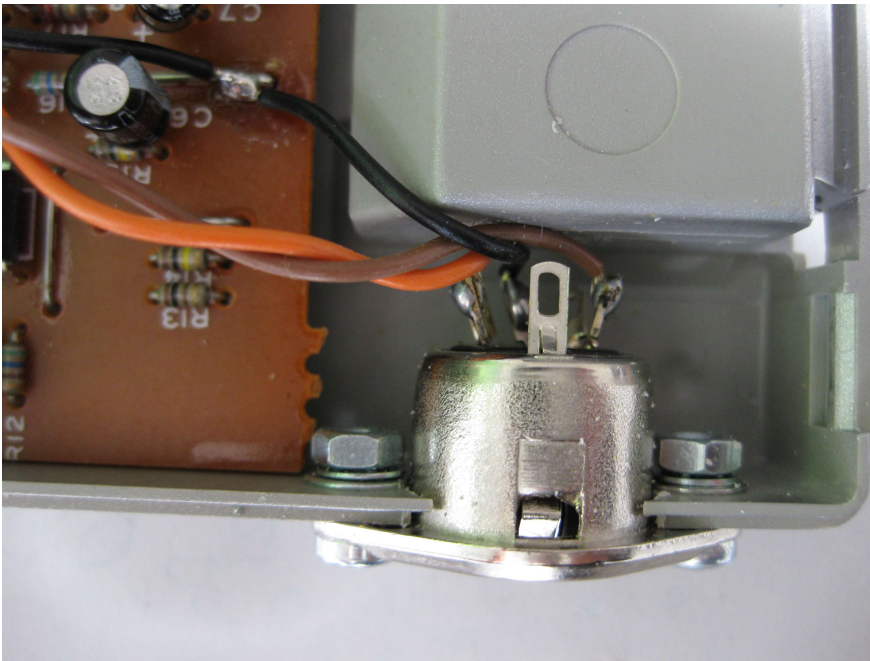
Pin 1 = brown

Pin 2 = black

pin 3 = orange

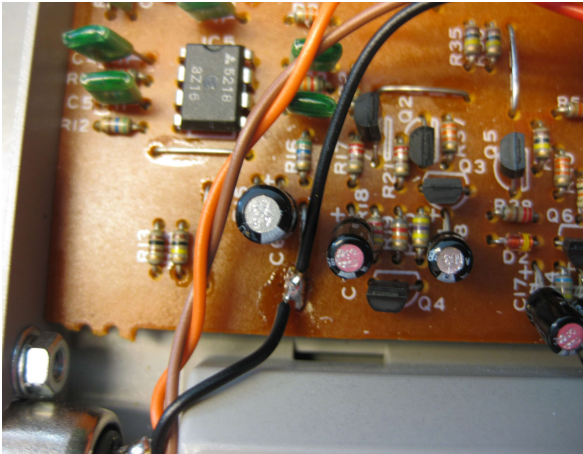
See picture 4.

Mating the male din connector with the din socket is easier when you can see the little nudge on the connector, therefore I advise to install the din socket with it pins located on the lower side. If you have a different opinion on this feel free to install it the other way around. Use the included M3 screws, washers, lock washers and nuts to mount the din socket into the lower part of the enclosure.

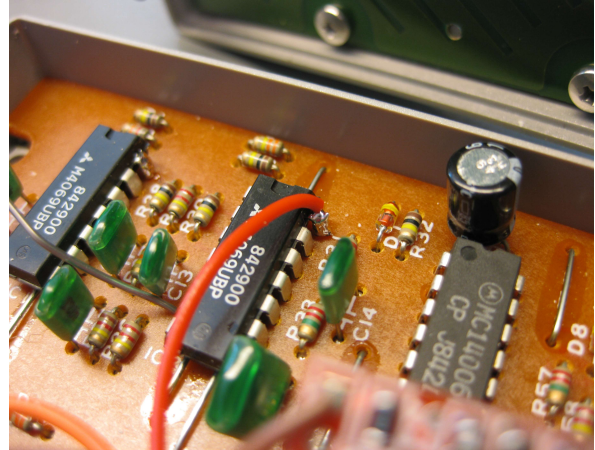


*Picture 4, the DIN-socket installed.*

## Wiring from the $\mu$ Sync to the DR-110



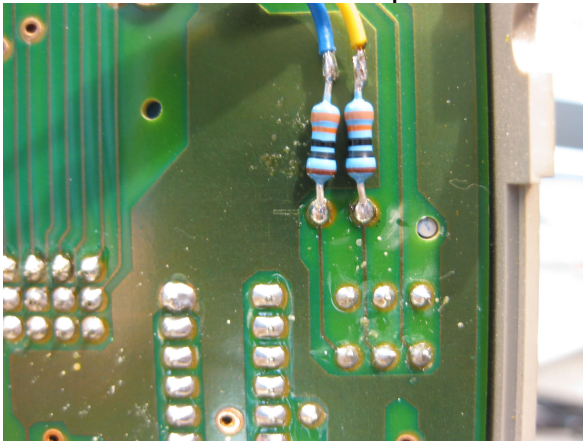
Picture 5, location of the black wire



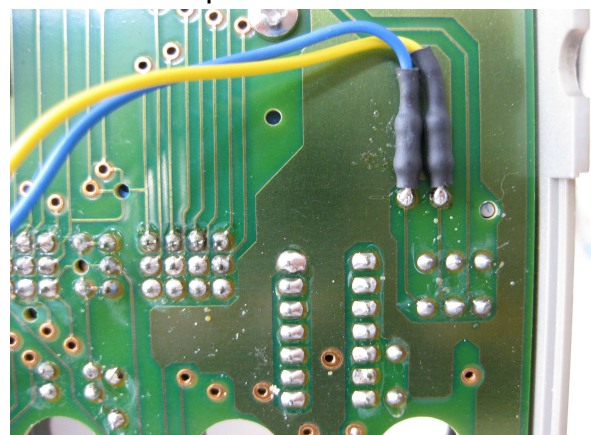
Picture 6, location of the red wire.

Connect the black wire to the jumper near C8 on the voice board together with the black wire coming from the din socket, for details see picture 5.

Connect the red wire to pin 14 of IC 2, for details see picture 6.



Picture 7, location of the resistors and yellow and blue wires

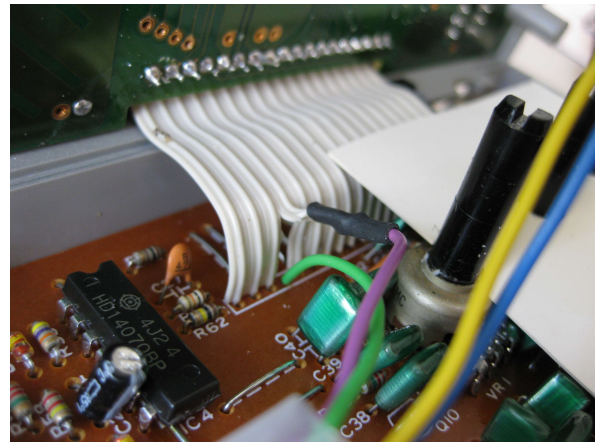


Picture 8, heat shrink fitted over the resistors.

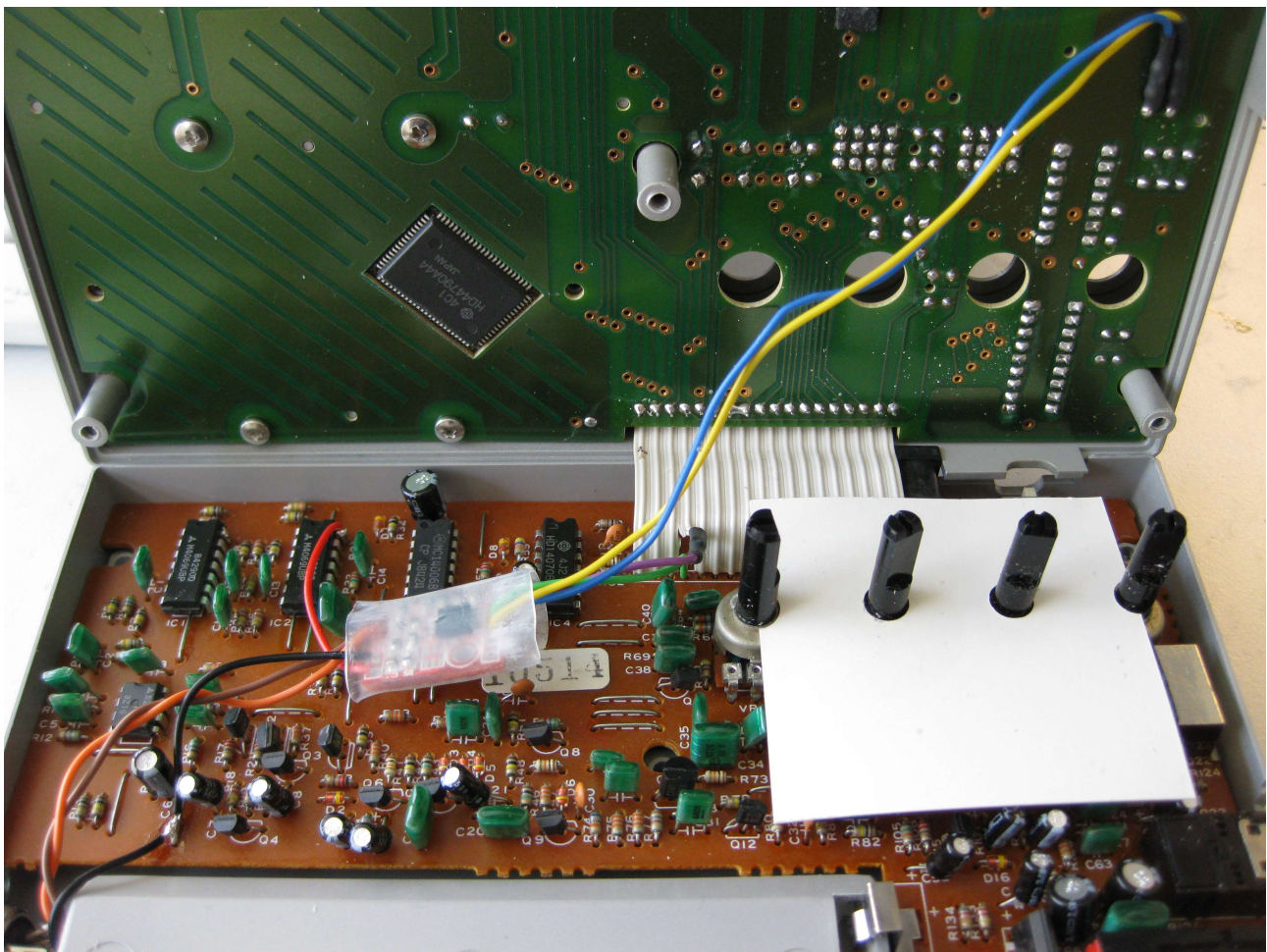
Before proceeding to the next step put the large transparent heat shrink onto the long wires so you can isolate the  $\mu$ Sync board in a later stage.

Solder the 2 included resistors to the yellow and blue wire. Put the small black heat shrink over the resistors and solder the resistors to the pads on the bottom side of the CPU board as indicated on picture 7. Use the heat gun the shrink the heat shrink over the resistors. The result should look something like picture 8.

Fit one of the small pieces of black heat shrink over the purple wire and solder the purple wire to the flat cable. Solder the green wire in the hole where the flat cable wire use to be. Slide heat shrink over the connection between the flat cable and purple wire. Shrink the heat shrink to a tight fit. See picture 9. Picture 10 shows an overall view of the DR-110 with the  $\mu$ Sync installed.



*Picture 9, location of the purple and green wire.*



*Picture 10, an overall view*

### **Test**

At this time it is wise to test DR-110 and check if everything is working as it should. Make sure the  $\mu$ Sync pcb is not touching anything inside the DR-110, you can do this by sliding the heat shrink over the  $\mu$ Sync pcb. Put the batteries inside the DR-110 or connect an external power adapter. Turn on the DR-110 and check without a sync cable connected if the DR-110 is behaving in the same way as before. Start a rhythm and change the tempo. If the DR-110 runs fine, stop the DR-110 and connect a sync cable to din sync source. Test if the DR-110 is running in sync with the master. If you use a Roland Tr-606, TR-808

or similar drum machine or sync box make sure the master is set in the right scale or division factor i.e. 24ppqn.

If the test works out fine put the heat shrink over the  $\mu$ Sync PCB and use a heat gun to shrink it to a tight fit. The  $\mu$ Sync can be placed in the free space on the voice board. When closing the DR-110 make sure the blue and yellow wire are fitted below the row of potentiometers. Now you can re-assemble the DR-110 and make some cool beats.