

BASTL INSTRUMENTS

SKIS v1.1-1.2 - Assembly Guide

bastl-instruments.com

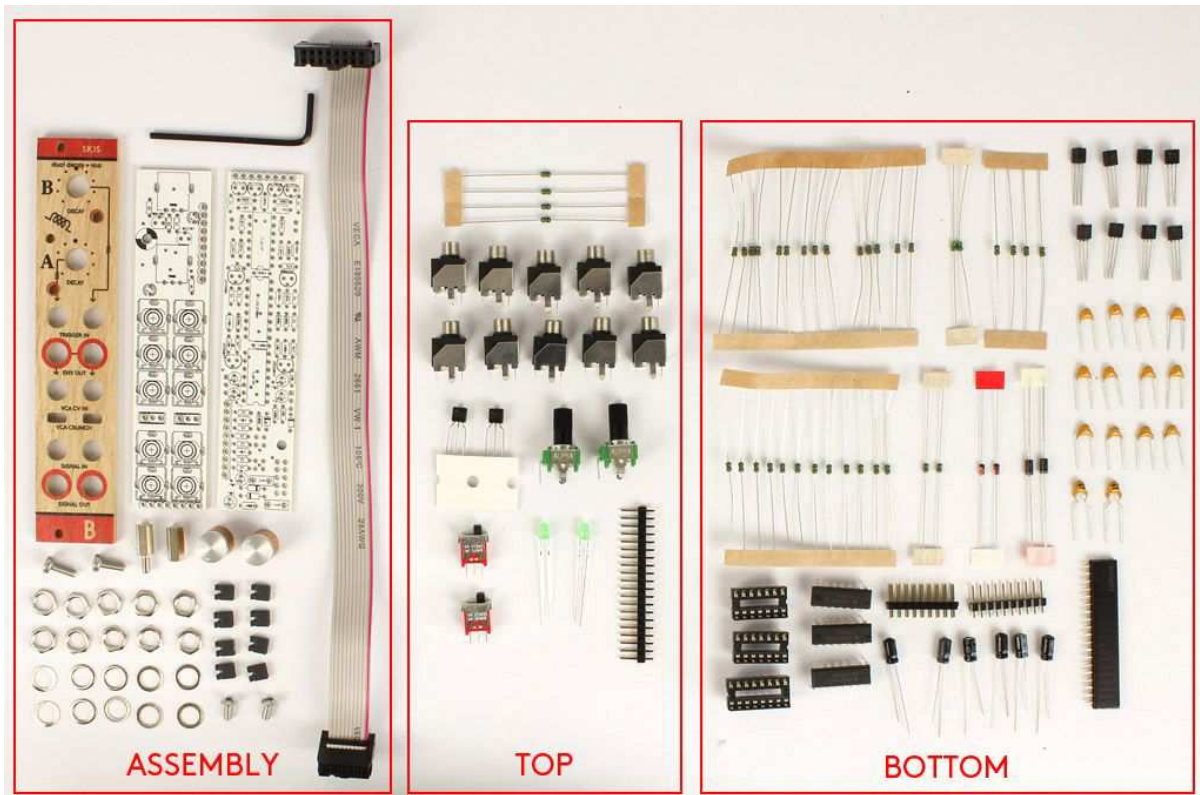


INTRODUCTION

This guide is for building Skis module from Bastl Instruments. It is good to have basic soldering skills and to be able to identify electronic components before starting this kit. However if you have never soldered before, check out this [tutorial first](http://www.instructables.com/id/How-to-solder/)¹. We included some of the best quality solder to help you solder everything faster and better.

The Skis module consists of two boards. All the parts comes in three bags separated for Bottom board, Top board and Assembly parts. See Bill of Materials ([BOM](#)) for detailed list.

¹ <http://www.instructables.com/id/How-to-solder/>



Before starting this kit, prepare the following tools:

- Soldering iron (15-20W)
- Multi-meter
- Flush cutters
- n2. hex screwdriver or allen key (enclosed with kit)
- Phillips screwdriver (cross)
- Wrench No. 8
- Protective eyewear

We suggest that you work in a clean and a well lit and ventilated environment to avoid accidents or losing any of the small components.

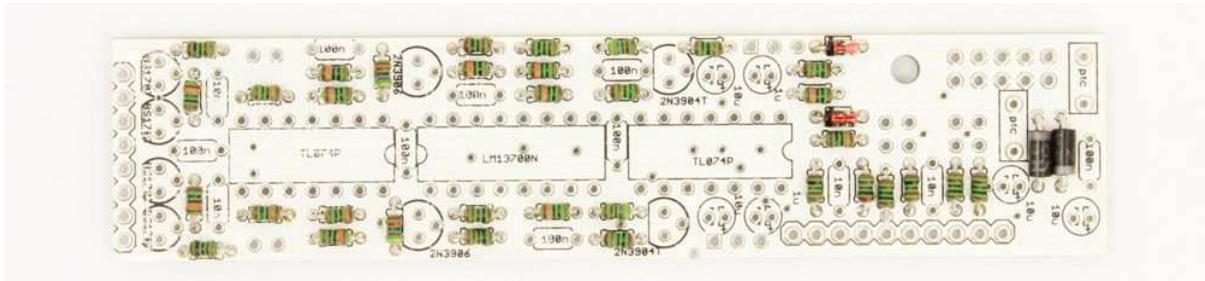
Also briefly go through this guide and make sure that you understand all the steps.

BOTTOM BOARD

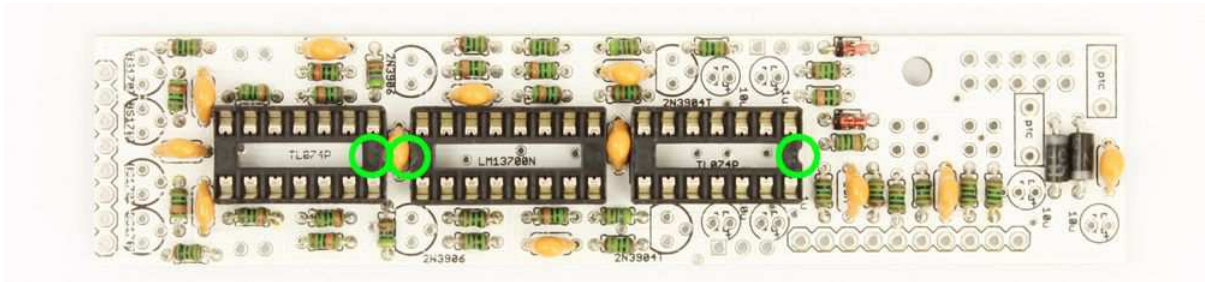
Let's start with the bottom board. Before you start soldering, take your time and find all the **resistors values** [using a multimeter](https://learn.sparkfun.com/tutorials/how-to-use-a-multimeter/measuring-resistance)² (or you can check the color codes if you are seasoned enough).

Now insert and solder 44 **resistors** (14x 100k, 4x 10k, 12x 1k, 2x 47k, 2x4k7). Then snip the leads as close to the PCB as you can (be sure to make this step on all remaining leads in the course of this guide). After that solder the **diodes**. There are four of them (2x 1N4148, 2x 1N4007). Be careful, diodes are polarized! Make sure that the marking ring on the diode body matches the marking on the PCB.

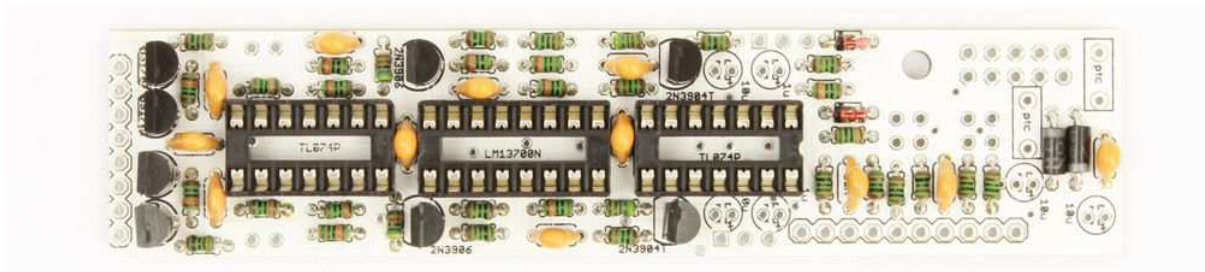
² <https://learn.sparkfun.com/tutorials/how-to-use-a-multimeter/measuring-resistance>



Now move to soldering the **IC sockets** (2x 14 pin, 1x 16 pin). **Make sure that the notch on the socket matches the print on the board.** After that add some **capacitors**. There are eight 100nF (marked "104") and four 10nF (marked "103").



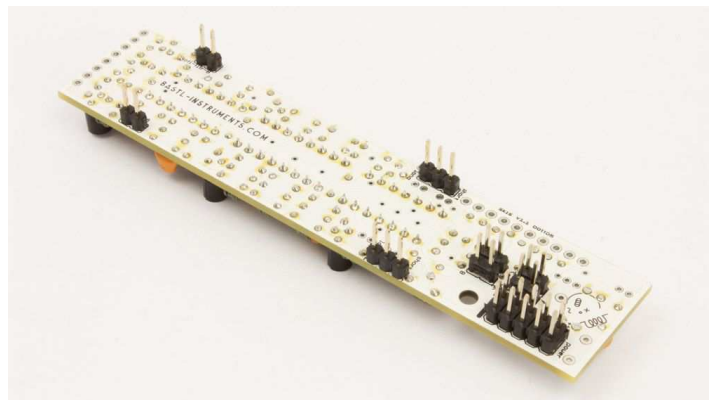
Next solder in the **transistors** (be careful though, they look quite similar): two **2N3904**, two **2N3906** and four **BS170**. Take care that they are oriented the same way as printed on the board. Flat side of transistors must match the outline drawn on the PCB.



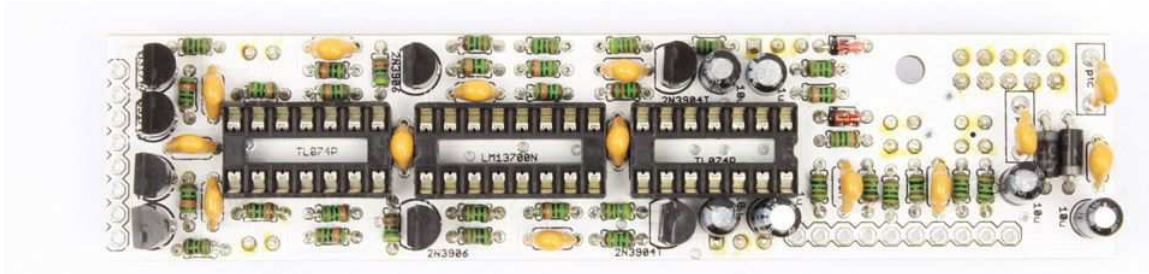
Turn around the PCB. Prepare with your flush cutters and solder the following **pinheaders**:

- **2x2 pin male** (2x)
- **2x5 pin male** (1x)
- **2 pin male** (2x)
- **3 pin male** (2x)

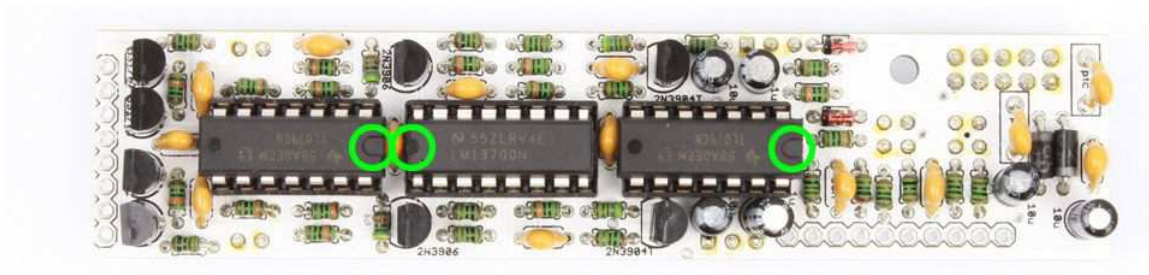
Be careful to solder the pinheaders straight. You may first solder one of the pin, take the board in your hand and re-heat that pin while pressing down on the header to align it (be careful, you don't want to touch the pin you are heating up). Wait for it to cool and solder the rest of the pins.



Turn the PCB back around. There are also **electrolytic capacitors** to solder: two 1 μ F and four 10 μ F. **Watch out for orientation!** There is a plus (+) sign on the PCB that should match the longer lead of the electrolytic capacitors. Then you add two **protective fuses** (they look quite similar to a ceramic capacitors but are placed in the “PTC” rectangular).

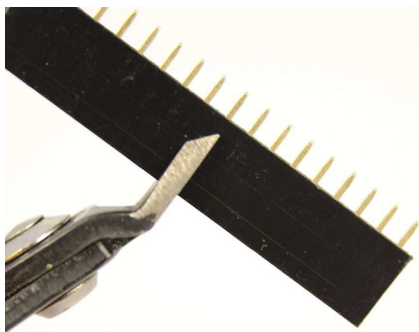
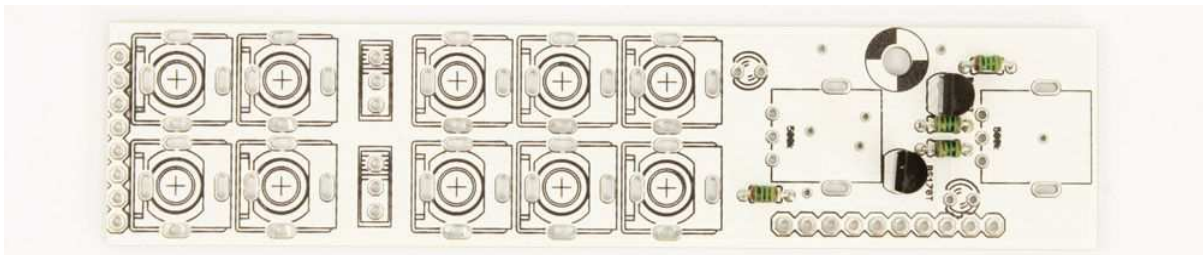


Next don't forget to place three **ICs** into the sockets (1x LM13700N, 2x TL074). There is a **notch** on the ICs that should match with the notch on the socket.

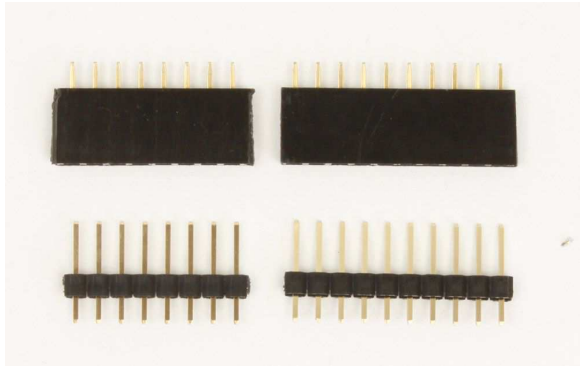


TOP BOARD

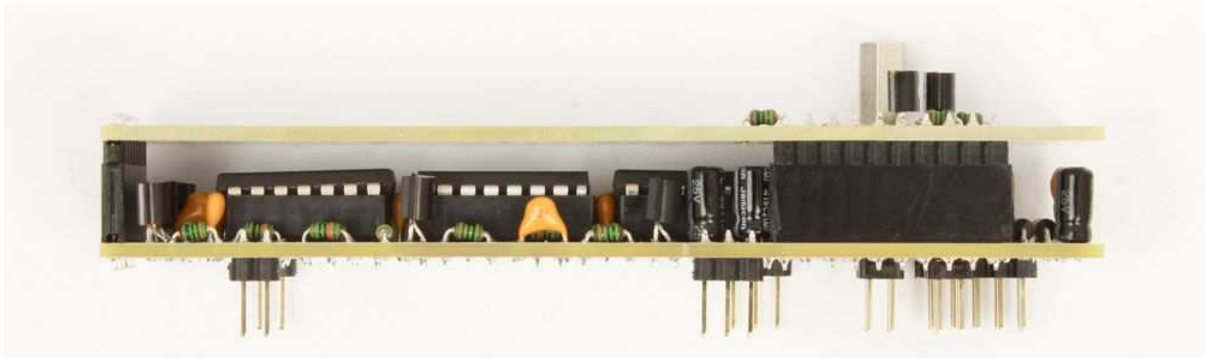
Now populate the top. Again start with the **resistors**. There are four of them (1k). Solder them and proceed to the **transistors** (2x BS170). Watch out for orientation here as well.



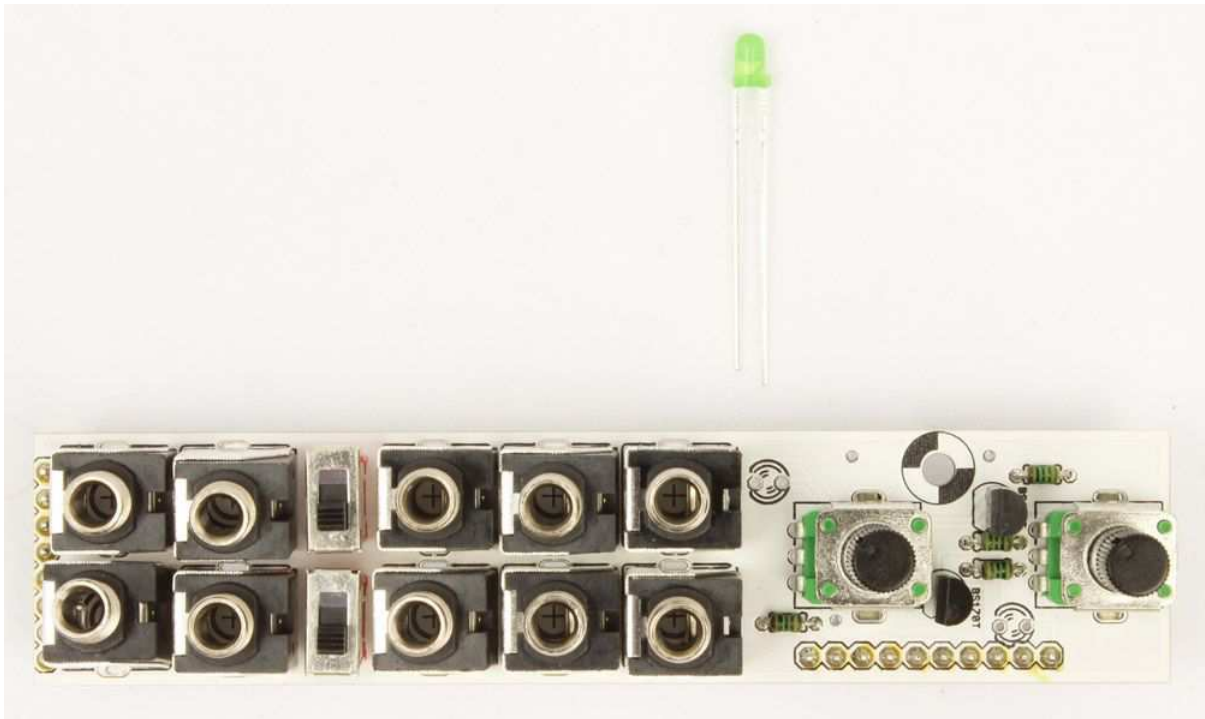
Prepare pinheaders with your flush cutters now. You need one **8 pin male** and **10 pin male**. Also do the same lengths from the **female** pinheader (you will always lose one pin when cutting the female headers, so be sure to cut it always after the last required pin - check the picture to see where to cut to get 8 pin).



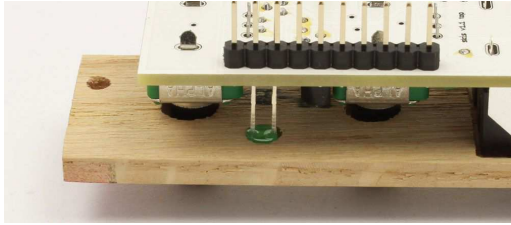
Now to ensure that the headers are properly aligned, screw the hex screw and the standoff on the bottom board. Place the female headers on the bottom board with the male pins inserted. Now place top board, screw with the standoff screw and finally, **solder the headers to both boards**. Unscrew the top saser and disconnect the boards then.



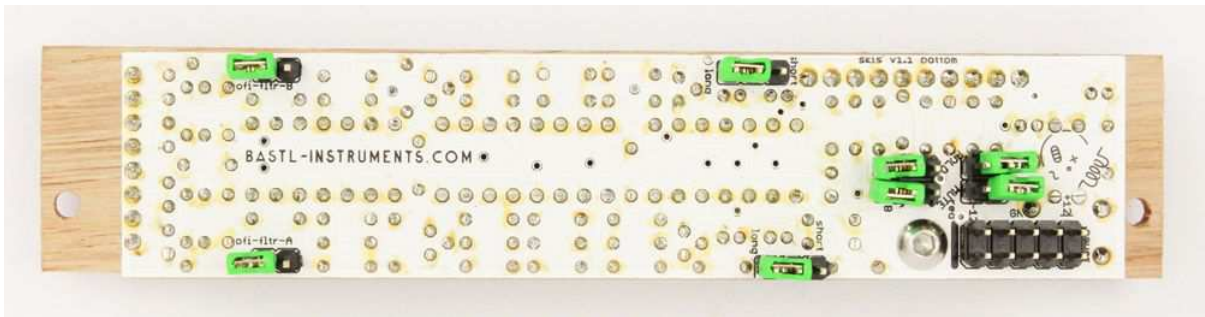
Place the two **potentiometers** to their respected places on the board. Push them well until they sit absolutely flat on the board, but don't solder them yet. Next, place the mono **jacks** (10x) on the board, the **LEDs** (2x) and the **switches** (2x). The **LEDs are polarized** so make sure that the longer leg matches the plus hole (+). Also the flat side on LED and the PCB should match. **Still don't solder anything yet.**

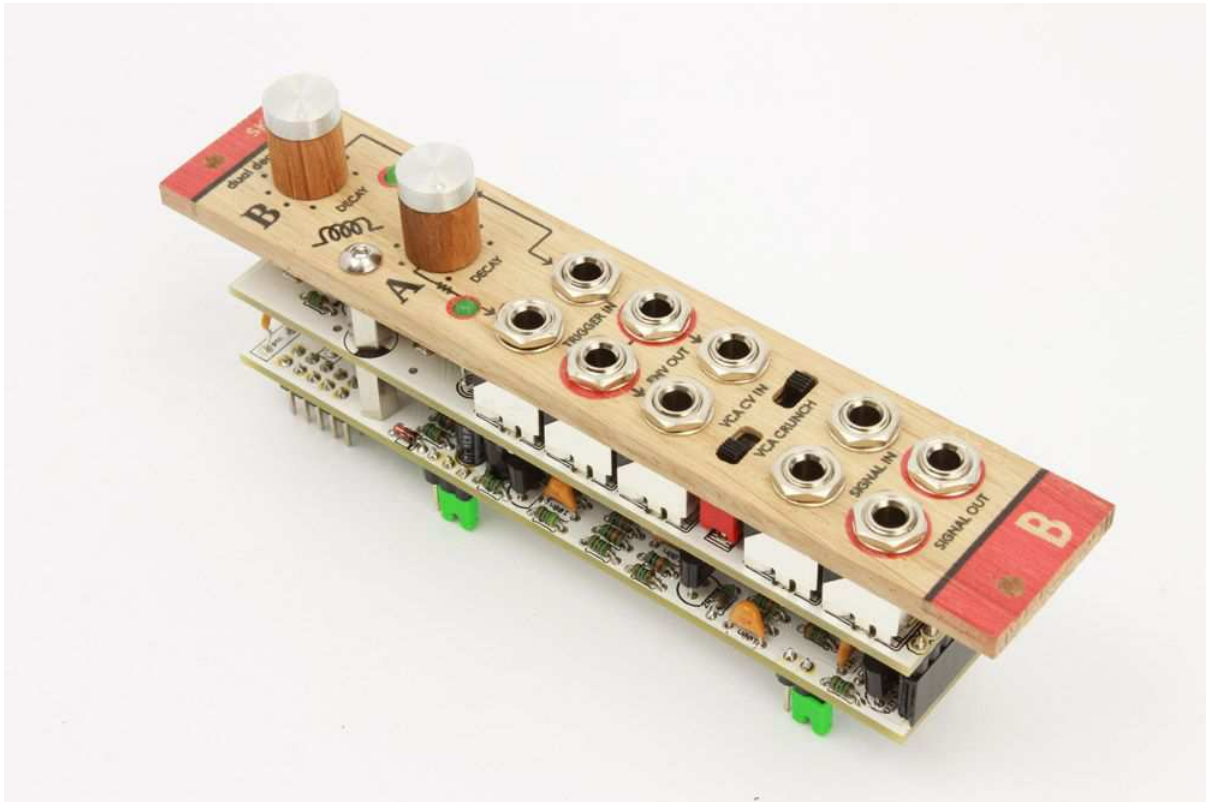


We want to make sure that all the components are properly aligned with the **front panel**: take the **nut - screw spacer** and place it in the opening. Screw the front panel with the **hex screw**. Secure also the jacks to the panel with the **washers** and the **nuts** (Don't tighten the screws and jack washers too much as you may damage the panel). Push the **LEDs** to fit its head on the panel. Push also the **switches** to be sure that they come through the panel. Make sure that everything is properly aligned. Now you are finally ready to solder all these components.



Congratulations! You have made it through, now just connect the boards together, add the **knobs**, **jumpers** (see the picture) and you are ready to enjoy your new module.





Before you connect anything, make sure that your system is disconnected from power. Also double check the polarity of the ribbon cable, the red cable should match the -12V rail both on the module and on the bus board!

TROUBLESHOOTING

First check out the [DIY F.A.Q.](#)

If you are having some more trouble, the best thing is to take a nap! Especially late at night!

If you are still in trouble you can send the detailed description of the problem with enclosed high-resolution photos on diy@bastl-instruments.com.

If you think that you are unable to make the module work on your own, consider our "[Come to Daddy](#)" service.

SKIS v1.1 BILL OF MATERIALS		
SOLDERING_TOP_SKIS		
qty	value	part
4	1k	R-EU_0204/5
10	jack connector	PJ-301BMB
2	BS170	unipolar transistor
2	500k	linear potentiometer
2	difuse green	LED
2		switch
1	18pin	male pinheader
SOLDERING_BOTTOM_SKIS		
14	100k	R-EU_0204/5
4	10k	R-EU_0204/5
12	1k	R-EU_0204/5
2	47k	R-EU_0204/5
2	4k7	R-EU_0204/5
2	1N4148	DIODE-D-5
2	1N4007	DIODE-D-7.5
8	100nF	ceramic capacitor
4	10n	ceramic capacitor
4	10uF	electrolytic capacitor
2	1uF	electrolytic capacitor
2	2N3904	NPN
4	BS170	transistor
2	2N3906	PNP transistor
2	100mA	fuse
1	19pin	female pinheader
1	10pin	male pinheader
1	2x9pin	male pinheader
2	14 pin DIL	DIL socket - in foam
1	16 pin DIL	DIL socket - in foam
1	LM13700N	IC in foam
2	TL74	IC in foam
ASSEMBLING_SKIS		
1	top	PCB
1	bottom	PCB
2		pot knob
1	11 mm	spacer nut x nut
1	11.5 mm	spacer nut x screw
10		jack washers
10		jack nuts
2	6mm	screw
2	8mm	screw panel
1	10-16 pin	power cable
8		jumper
1		front panel

