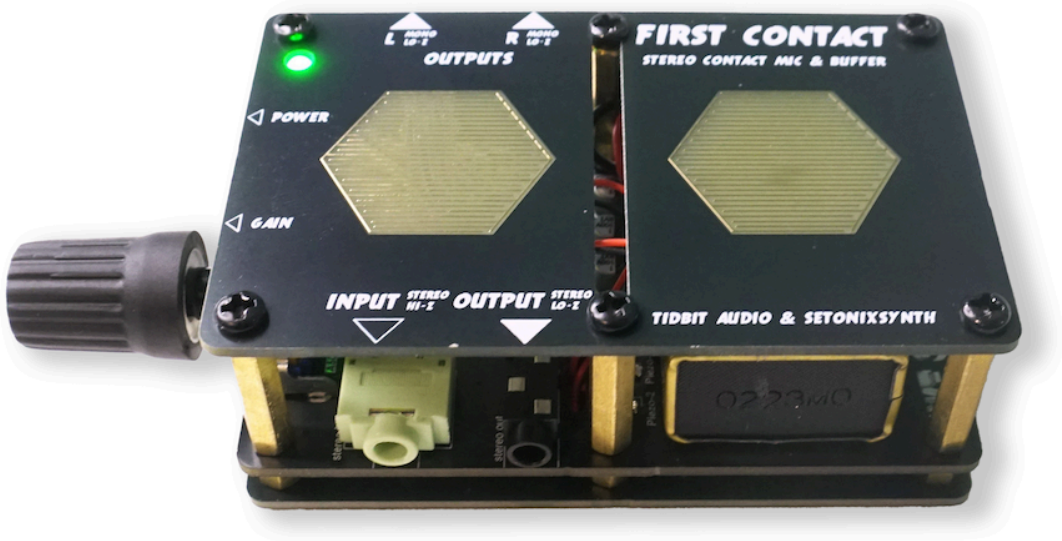

First Contact

Stereo Contact Mic & Preamplifier User Manual & Build Instructions

Theory of Operation:

The First Contact is a stereo microphone preamp with built-in stereo contact microphone. It can be used to amplify mic- and line-level mono and stereo inputs for many purposes, with great sound quality and a pleasing character when overdriven.

With no input, the First Contact turns into an electroacoustic performance device, with piezos mounted to the inside of the panel allowing it to be scraped, tapped, set on vibrating objects and more. The piezo combined with the onboard amplifier turns these vibrations into a useful stereo audio output.

Other uses include:
- Amplify contact mics and other sound sources while preserving the bass content
- Bring standalone line-level synths and audio devices (cassette player, Volcas, etc) up to modular synth level
- Trigger many Eurorack modules using internal contact mics
- Patch input to output for stereo drone oscillator
- Headphone amplifier for contact mics

The First Contact's long battery life, many uses and portable design make it a great device for minimal setups, field recording, and making music on the go. For those looking for creative ways to interface devices, the First Contact is definitely worth a look!

Features:
- Stereo 3.5mm input jack; includes stereo-to-dual-mono adapter
- Up to 15x gain of stereo input signal
- Individual L/R 3.5mm outputs for use with synthesizers
- Stereo 3.5mm output jack; can be used with headphones
- 9V battery power with long life (>24 hours) *battery not included*
- Durable construction; ideal for portable setups

Before you start soldering, it's a good idea to review the Bill of Materials and make sure no parts are missing from the kit. Make sure you are in a well-ventilated area before soldering!

The following materials and tools are required to complete this build:
- Soldering Iron
- Decent quality solder (lead free no-clean SAC305, Kester or similar)
- Quick drying superglue, contact adhesive or two-part jewelers' epoxy
- Flush cutters
- Small Philips Head screwdriver

The following tools are also recommended:
- Desoldering wick
- Solder sucker
- Handheld wire stripper
- Digital multimeter
- Third hand or table clamp

Bill of Materials:

Quantity	Part	Specs
1	Panel	
1	Rear Panel	
1	PCB	
4	1uF electrolytic	5x11
1	10-22uF electrolytic	5x11, 16V or greater
2	470nF film	5.00mm lead spacing
1	220nF ceramic	5.00mm lead spacing
1	100nF ceramic	5.00mm lead spacing
2	3.3k	1%, 1/4W, 6.35mm
2	470R	1%, 1/4W, 6.35mm
2	47k	1%, 1/4W, 6.35mm
1	330R	1%, 1/4W, 6.35mm
1	10k (or adjust to suit LED)	1%, 1/4W, 6.35mm
1	4.3V zener	1/2W
1	LM358	DIP-8
1	LED	3mm, green or preferred color
1	Switch	SK12F14, SPDT
1	A50k dual pot	Alps RK12 Horizontal D-Shaft
1	Rubber knob	D-Shaft Type
1	Battery clip	Keystone 71 type
2	Piezo transducer	25mm Radius or similar
1	Stereo input jack	PJ307 type; switched tip & ring
3	3.5mm output jack	PJ320 type, unswitched
1	Battery snap	Standard 9V, low profile
6	20mm spacer	20mm Hex Female
6	5mm spacer	5mm Hex Male
12	M3 x 4mm screws	Black color
2	M2.5 screws	"Ultra Thin" Phillips Head
2	M2.5 nuts	

First Contact Stereo Contact Mic / Preamplifier Assembly Instructions:

1. Place the 8 resistors in their appropriate footprints. Once they are in place, solder them. You can solder from either side, but we recommend soldering the legs on the top side of the PCB, which makes it easy to solder without bending the resistor legs. Once you are satisfied with your work, use your flush cutters to trim the excess resistor legs on the underside of the PCB.

2. Place the two ceramic capacitors in their appropriate footprints and solder them. These are easiest to solder from the underside. Check your work, then trim the excess capacitor legs.

3. Place the Zener diode in its footprint. Unlike the resistors and ceramic capacitors, it matters which direction this part goes! Make sure the stripe on the diode matches that of the footprint, then solder it and trim the excess once again.

4. Stick the 4x 1uF and 1x 22uF in their footprints but do not solder right away. One by one, hold them in place and solder one leg on the underside of each. Before you solder the second leg of any capacitor, use your finger to reheat the initial solder joint as needed and straighten each capacitor so it sits straight and perpendicular against the PCB. Once each capacitor is well in place, solder the second legs and trim the excess.

5. Place the 2x 470nF film capacitors in place and repeat the process as in Step 4.

6. Put the LM358 chip in its footprint. **Make sure the top of the chip corresponds to the notch in the PCB silkscreen!** Once you are absolutely sure it is in the correct orientation, use your finger to hold it in place while you flip the PCB over and solder just one pin. Before you solder more than one, check again that the IC is in the correct orientation, that it is as flat as possible against the PCB, and that all 8 legs are in their footprint hole. If all these things are true, go ahead and flip the PCB over again, and solder the remaining legs of the chip. Make sure not to short any of the legs together.

7. Place the power switch in its footprint, with the actuator facing outwards. Hold it in place with a finger, then flip the PCB over and solder one pin. Inspect the switch to make sure it is straight, then go ahead and solder the other pins.

8. Place and solder each of the audio jacks: the larger green Stereo Switching jack is for the Input while the three smaller black jacks can be used in any of the three Output positions.

9. Prep the horizontal potentiometer. The default part has a 30mm shaft, which causes the knob to stick out a little. If it has not already been cut for you (as with official DIY kits), you can use your flush cutters to carefully but firmly cut 4mm or so off the end of the pot shaft. The exact length is not very important as there is a guard on the pot which will keep the knob from rubbing against the body of the First Contact later.

10. Place the potentiometer in its footprint, facing outwards. As with the other parts, hold it in place while you solder one leg, then check your work before soldering the rest of the legs and the larger mechanical tabs on the sides. The 6 small legs of the potentiometer are relatively close together, so keep the tip of your soldering iron clean and be careful not to short any together when you solder them.

11. Prep your battery snap cable. Trim both leads so that they are about 2” or 50cm long, then use wire strippers or flush cutters to strip about 1mm of insulation off the ends. Use your soldering iron to “tin” the ends by applying a little solder to the tip of each so the tip forms a hard point.

12. Thread the two battery snap leads through the oval hole next to the two plated holes labeled “9V”. Fit the two tinned leads through the plated holes from the underside of the circuit board, **making sure that the red lead corresponds to the hole labeled “+”,** and solder the leads from the top side of the PCB. By doing it this way, the side hole provides strain relief for the battery snap.

13. Fasten your metal battery clip to the PCB. Put the two flat M2.5 screws through the holes on both the clip and the PCB, hand-tighten on the M2.5 nuts, then use a small screwdriver to tighten the screws further until the battery clip is snug in place.

14. Inspect your work. Everything should be soldered in place at this point except the LED and the two Piezo Transducers, so make sure all your solder joints look clean and nothing is shorted together.

15. One by one, insert the short 5mm spacers through the underside of each of the six mechanical holes on the corners and sides of the PCB, then screw a 20mm spacer onto the threaded head of the spacer on the top side so each pair of spacers holds tight in place with the PCB between them.

16. Place your LED in its footprint so that the **shorter leg is in the square hole marked “k”,** short for cathode for some reason. This also corresponds to the flat side of the LED. **Do not solder the LED yet!**

17. Place the top panel over the main PCB and use a couple of the short black M3 screws to temporarily hold the panel in place against the 20mm spacers.

18. Fit the still-unsoldered LED through the corresponding front panel hole. Flip the whole assembly over so that gravity holds the LED in place poking partially through the panel hole, and solder one leg of the LED. Double check that the LED is still in place; if it is, solder the other leg and clip off any excess LED leg on the bottom of the PCB.

19. Unscrew the top panel and remove it, then set it aside.

20. Prep your contact mics: “tin” the ends of each wire of your two Piezo Transducers. You most likely won’t have to trim the leads on these as they are usually pretty short.

21. For each of the Piezo Transducers, follow the same instructions as in Step 12 for the two footprints at the bottom of the PCB labeled “Piezo-1” and “Piezo-2”, which is to say thread each of them through the mechanical relief hole and solder on the top side of the PCB. Once again, **make sure the red wire of each transducer goes to the hole marked “+”!**

22. At this point everything should be soldered in place. Put a 9V battery in your battery clip with the terminals facing “upwards”, and connect your battery snap to its terminals.

23. Power on the device. If it is working, the first sign will be illumination of the LED. If that looks good, go ahead and plug a pair of headphones into the 3.5mm Stereo Output jack at the bottom of the PCB. You should be able to hear sound produced by the two Piezo Transducers, especially if you touch them with your fingers. Play with the Gain potentiometer to make sure both sides of it work, and also check the two Mono jacks to make sure they work by plugging them into a mixer or just listening through one side of your headphones again. You can also try plugging something into the input jack, though the Piezos are normalized through it so if you hear both sides of contact mic with nothing plugged in, the input jack most likely works.

24. If all the functions work, switch off the device and disconnect any cables from it. It's time for final assembly! If you need to prep your glue or epoxy, now is the time to do it.

25. Put a decent amount of super glue or epoxy on the backside of the front panel, inside the holes marked "Piezo-1" and "Piezo-2".

26. Double check which Piezo transducer is connected to which PCB footprint, as Piezo-1 on the PCB should correspond to Piezo-1 on the Panel, and Piezo-2 to Piezo-2 respectively.

27. Orient the Piezo Transducer connected to Piezo-1 so that its wire has as much "slack" as possible when flat against the backside of the Panel. The Panel will eventually mount to the 20mm spacers as before, so take this into account when placing the transducers.

28. Do the same thing for the Piezo Transducer connected to Piezo-2.

29. Holding them in place with a finger if necessary, make sure the transducers stay relatively centered on the backside of the panel while the glue or epoxy dries.

30. Once your adhesive of choice holds the transducers firmly in place, carefully place the front panel with Piezos attached on top of the 6 20mm spacers. Put black M3 screws in all 6 spacer holes on the front panel to hold it in place, and tighten as needed with a small screwdriver.

31. Place the rear panel over the 5mm spacers on the bottom side of the Main PCB. Use 6 more M3 screws to fasten the bottom PCB, and tighten with a screwdriver.

32. Put your D-Shaft knob on the potentiometer if you haven't already in order to complete the build. Congratulations, you finished building the First Contact. Time to make noise and have fun!