

Supplementary Material for: Practical Microcircuits for Handheld Acoustofluidics

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I. FABRICATION GUIDE

Taking the handheld nebulizer as an example we show here how to fabricate a complete device from start to finish. With this example, it is our hope that interested groups can recreate this type of circuit for their own application given a month of support or less from a professional circuit designer or an advanced electrical engineering student to fit the design to their application.

1. Follow the design, layout, and testing procedure as described in the main article
2. Assemble a parts list for the PCB along with files required for PCB manufacture (see 'Nebulizer Fabrication/PCB' in the ESI †)
3. Design a transducer holder (see 'Nebulizer Fabrication/Transducer Holder' in the ESI †) and ensure that it will interface with your PCB in the next step
4. Simulate the full integrated design in a CAD software (we used Solidworks, see 'Nebulizer Fabrication/CAD' in the ESI †)
5. Order your PCBs from a manufacturer that will also populate the circuit (we used *PCB Minions*)
6. Order the additional parts for the fully integrated design (see Bill of Materials below)
7. Assemble the complete device in your lab

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Bill of Materials for nebulizer

- Populated driver circuit (manufactured and assembled by PCB minions)
- Transducer holder PCBs (manufactured by OSHpark, see files in the ESI †)
- Lithium Ion Battery - 3.7 V 2000 mAh ([Adafruit part](#))
- Battery charger ([Adafruit part](#))
- JST-PH 2-pin SMT right angle connector ([Adafruit part](#))
- (x4) 15 mm M3 nylon standoffs
- (x4) 8 mm M3 nylon standoffs
- (x5) M3 nylon nuts
- 5 mm M3 nylon screw
- (x4) Spring-clip contact ([Digi-key part](#))
- (x2) vertical, 2-Pos header pins
- 3D printed syringe tip holder parts ('shoe' and 'buckle' in Solidworks files)
- (x4) 0-80 3/8 inch machine screws
- (x4) 0-80 machine nuts
- 12 gauge (ID 0.089, OD 0.109) 0.5-inch syringe tip ([Jensen Global part](#))
- 2 mm diameter, 25 mm long fiber bundle wick
- Luer-Lock syringe reservoir (3 or 10 mL)