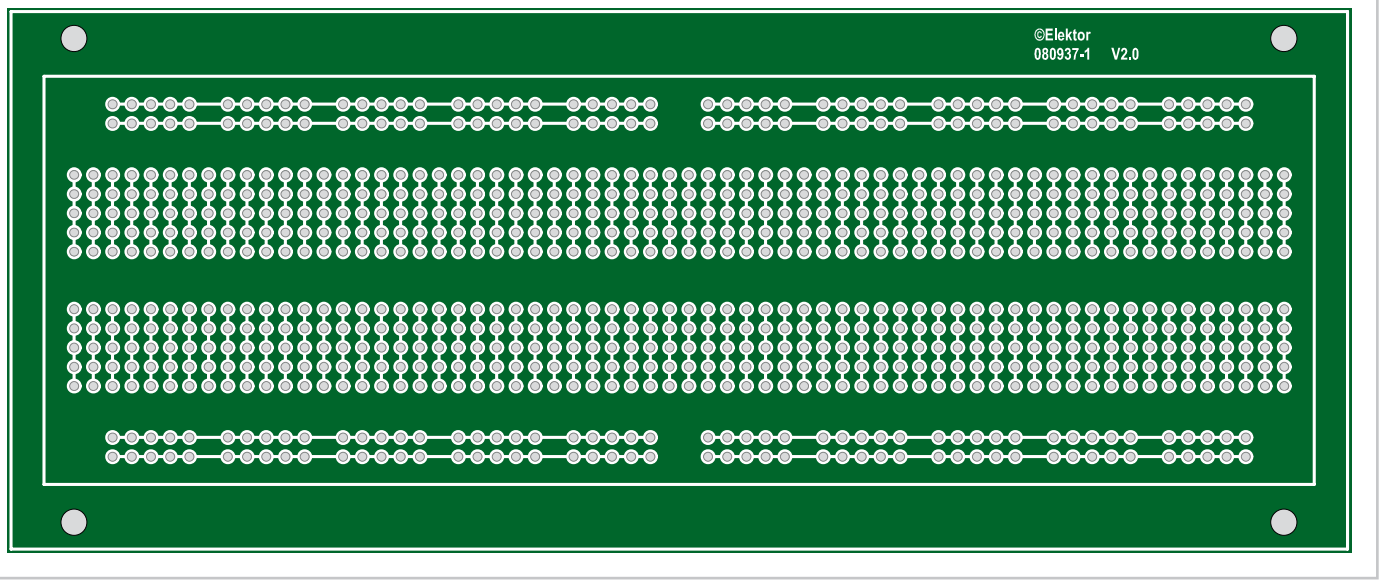
Breadboard/Perfboard Combo



Based on an idea from Luc Heylen (Belgium)

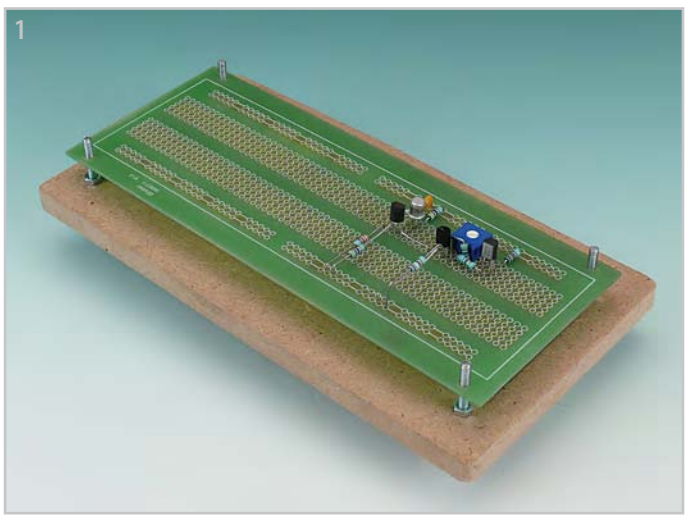
Electronic hobbyists and engineers often use breadboards to experiment with small circuits. A breadboard consists of a thick strip of plastic with an array of holes and embedded metal contact strips that interconnect individual rows of holes. A few long rows extending over the entire length are located along the sides; they can be used for supply voltages. With this arrangement of holes and strips, you can plug all sorts of electronic components (including ICs) into the breadboard and build a circuit by interconnecting them as desired with short lengths of wire. Of course, we don't have to explain this to most of our readers, since they have probably used a breadboard occasionally.

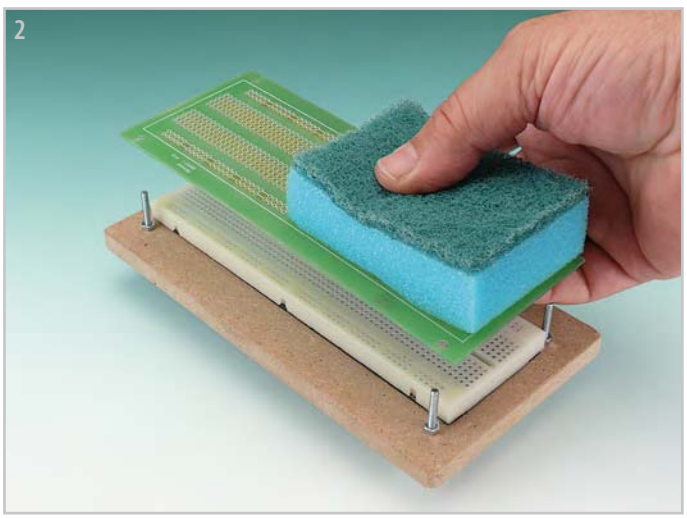
The advantage of a breadboard is that you can try out different ideas to your heart's content without having to use a soldering iron every time you make a change. It's also a lot easier to see what you're doing than when you build a circuit on a piece of perfboard, where the wiring on the copper side can quickly turn into a rat's nest that isn't so easy to sort out when you want to make changes.

Of course, breadboards also have their disadvantages. They can't be used for RF circuitry, which is something you always have to consider. The spring contacts also tend to wear or weaken over time, which can lead to poor connections. Despite these disadvantages, breadboards are especially convenient and affordable tools for electronic designers.

If you do a lot of work with a breadboard, you are often faced with the problem that after you have managed to build and test a circuit that works the way it should, you have to take it all apart and rebuild it on a piece of perfboard because the circuit has to be used somewhere right away. In such cases, leaving the circuit in its breadboard form is not a long-term option.

The person who thought up the idea described here, who is a fervent breadboard user, encountered this problem regularly and came up with the following solution. Make a printed circuit board with the same layout, hole spacing and interconnections as a standard breadboard. Secure this PCB on top of the breadboard, and then plug the components and interconnecting wires through the holes in the PCB, mounting them the same way as you would normally do with the breadboard (**Photo 1**). Use slightly longer component leads and wire ends than usual, due to the extra thickness of the PCB. Fit ICs in sockets with extra-long pins (wire-wrap pins). In a cir-





cuit built using this arrangement, the contact strips in the breadboard provide the interconnections, so there's no need for soldering.

Once the circuit is finished and works the way it should, you don't have to rebuild it before you can use it somewhere else. Press a sponge or a bag filled with styrofoam particles on top of the circuit (**Photo 2**) and clamp it securely in place (**Photo 3**). After this, you can pull the PCB with the components free from the breadboard, turn it over, and then trim all the leads protruding from the copper side and solder them in place (**Photo 4**). The interconnections are exactly the same as on the breadboard.

To make it easy to work with this combination of a breadboard and a PCB, it's a good idea to mount the breadboard on a piece of wood with four long M3 screws arranged to fit exactly through the corner holes of the printed circuit board. This way you can mount the PCB precisely and securely on top of the breadboard.

For the breadboard, we used a type SD12N from Velleman [1], which is carried by a number of electronics retailers. Note that other types of breadboards may have different dimensions or contact arrangements, which means that they cannot be used with the PCB layout shown here.

(080937-I)

Internet Link

[1] www.velleman.be/nl/en/product/view/?id=40573

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080937-1: PCB layout (.pdf), from www.elektor.com/080937