

Fish tin noise kit:

Schematic:

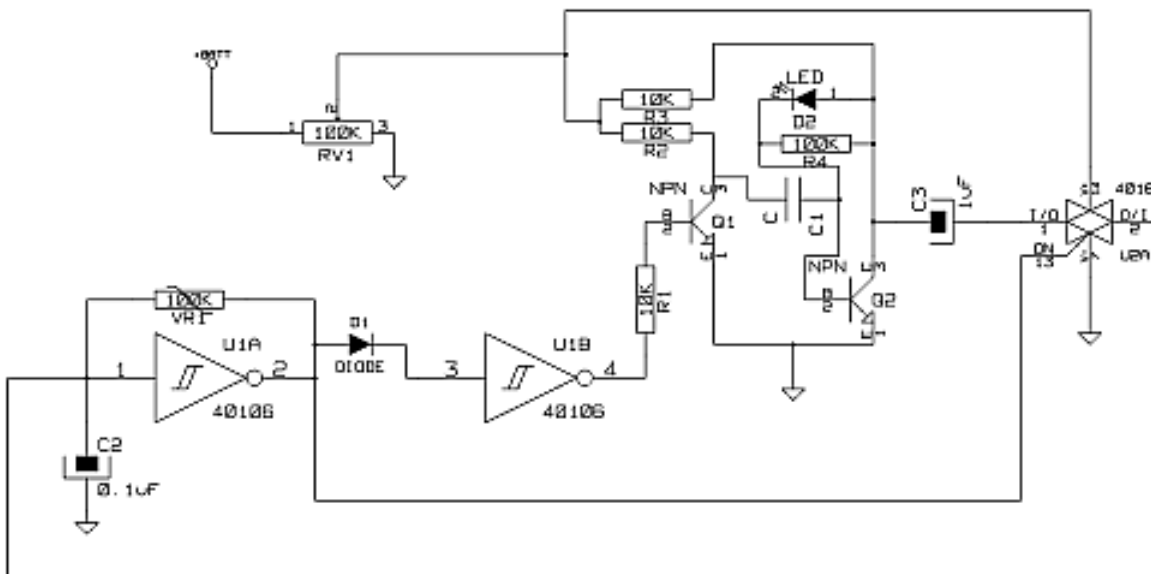
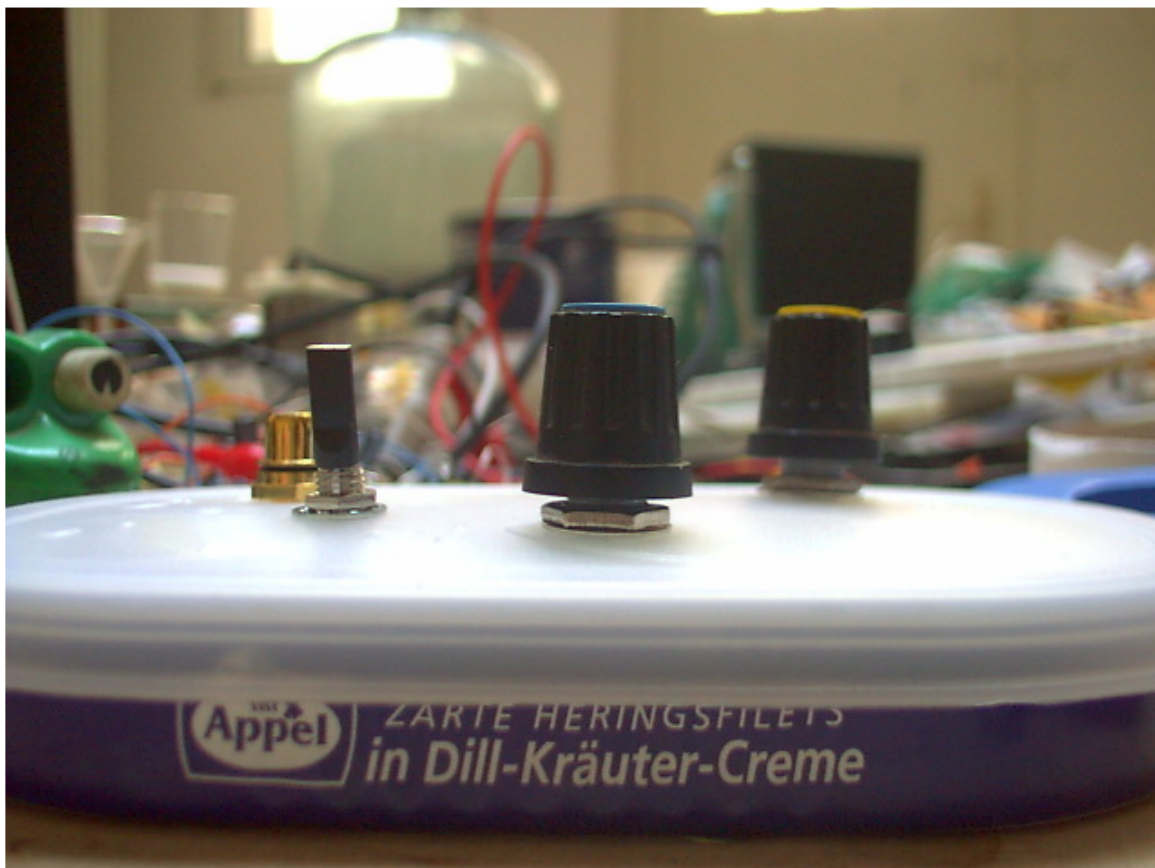


Image:

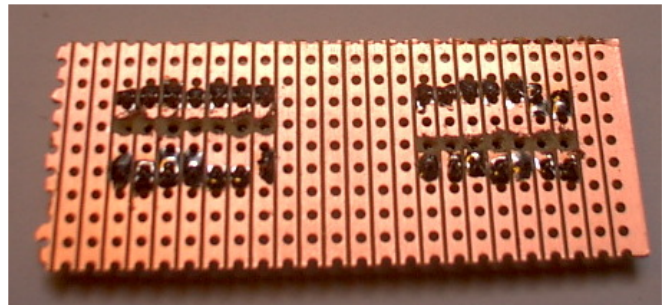
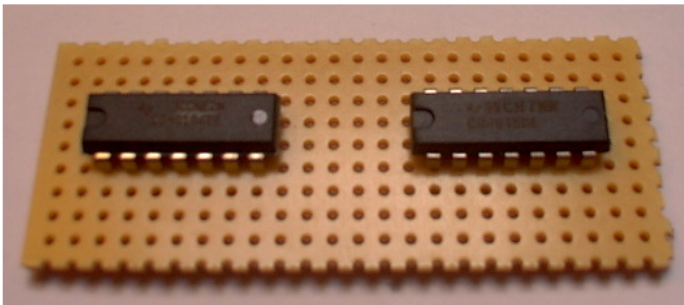


Description:

The fishtin kit is composed on one oscillator placed in a switched feedback loop with two transistor distortion. The oscillator is based on the CMOS 40106 schmitt trigger inverter with frequency determined by the 0.1 uF capacitor and the variable resistor (adjust frequency). The square wave output is loosely coupled to a second inverter which provides some instability. This output is distorted by two common NPN transistors and fed to both the RCA output and into a simple digital switch within the second 4016 IC. This switch, which feeds the signal back into the first inverter/schmitt trigger stage is controlled by pulses from this first oscillator. The second variable resistor is used within a voltage divider configuration to supply varying power to both chips - this changes the switching threshold in both cases and throws in further instabilities! The kit is assembled on veroboard to allow for further customisations and experimentation.

Assembly instructions:

1] After eating the fish, the first step is to solder both chips in place; both of them oriented with text facing you and notch to the left so that pin 1 is in the bottom left corner. Leave a few holes/strips to the left and right of both chips and six holes between the tow chips. Make sure that the copper strips on the board are oriented vertically. Finally, once soldered in place, use a small craft knife to cut a notch between each row of pins for each IC so that the pins do not connect vertically.

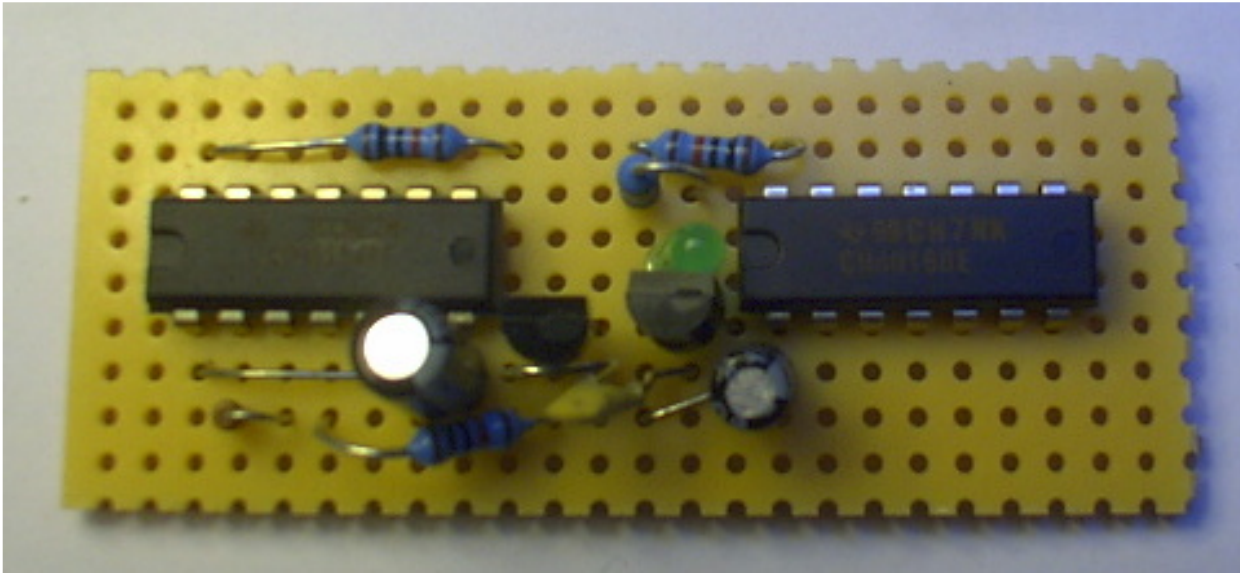


2] Solder the two transistors so that they line up with the bottom edge of the two chips - with the pins now filling the gap of six holes between the two chips. The flat side of the 2n3904 transistors should be parallel to the top of the chip (round side towards you). Clip leads as you go on the bottom side.

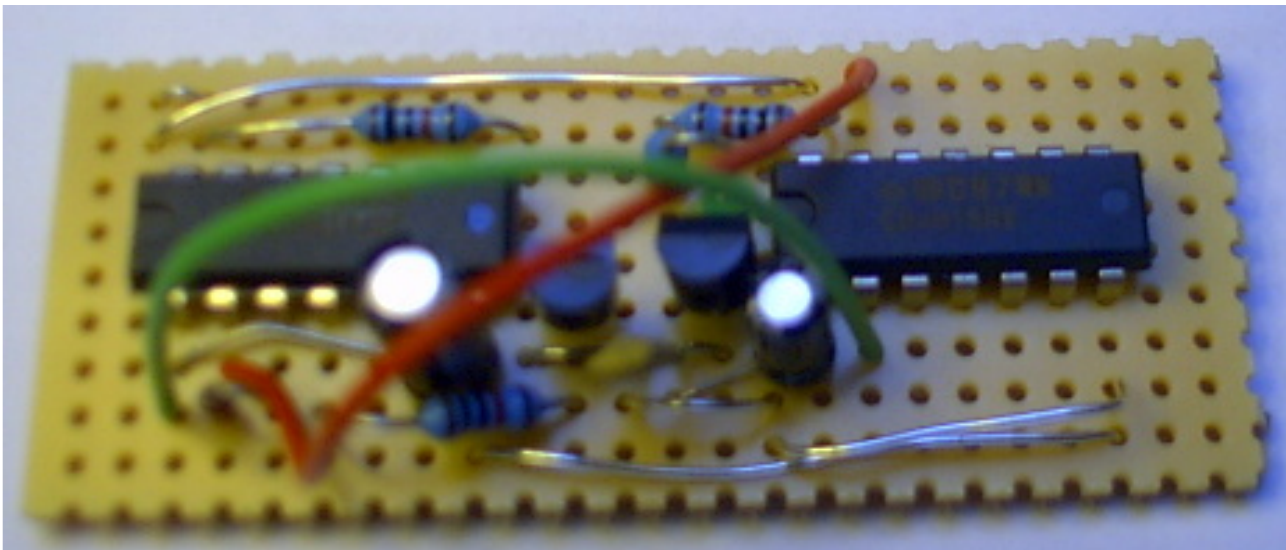
3] Solder the three 10K (brown, black, black, red) resistors in place. The first should go between pin four of the 40106 chip and the middle pin of the first transistor. The second from pin one of the first transistor (left) to pin 14 (top right) of the 40106. The third goes from pin one (left) of the second transistor to pin 14 of the 4016. Solder the 100K (brown, black, black, orange) resistor between pins one and two of the second transistor.

4] Solder the 0.1 uF electrolytic capacitor between pin one (bottom left) of the 40106 and pin seven (bottom far right) of the same chip. make sure that the minus side (marked as white band with minus sign inside) is in direction pin seven. Solder the small 10 nF capacitor (small yellow) between pin one of the first transistor and pin two of the second. Solder the 1 uF capacitor between pin one of the second transistor and pin one (bottom left) of the 4016 chip, again making sure that the minus band/line is oriented to your right.

5] Place and solder the small 1n4148 diode between pins two and three of the 40106 with the black band oriented right. Solder the red (or green) LED between pins one and two of the second transistor with the longest pin on the left (pin one).

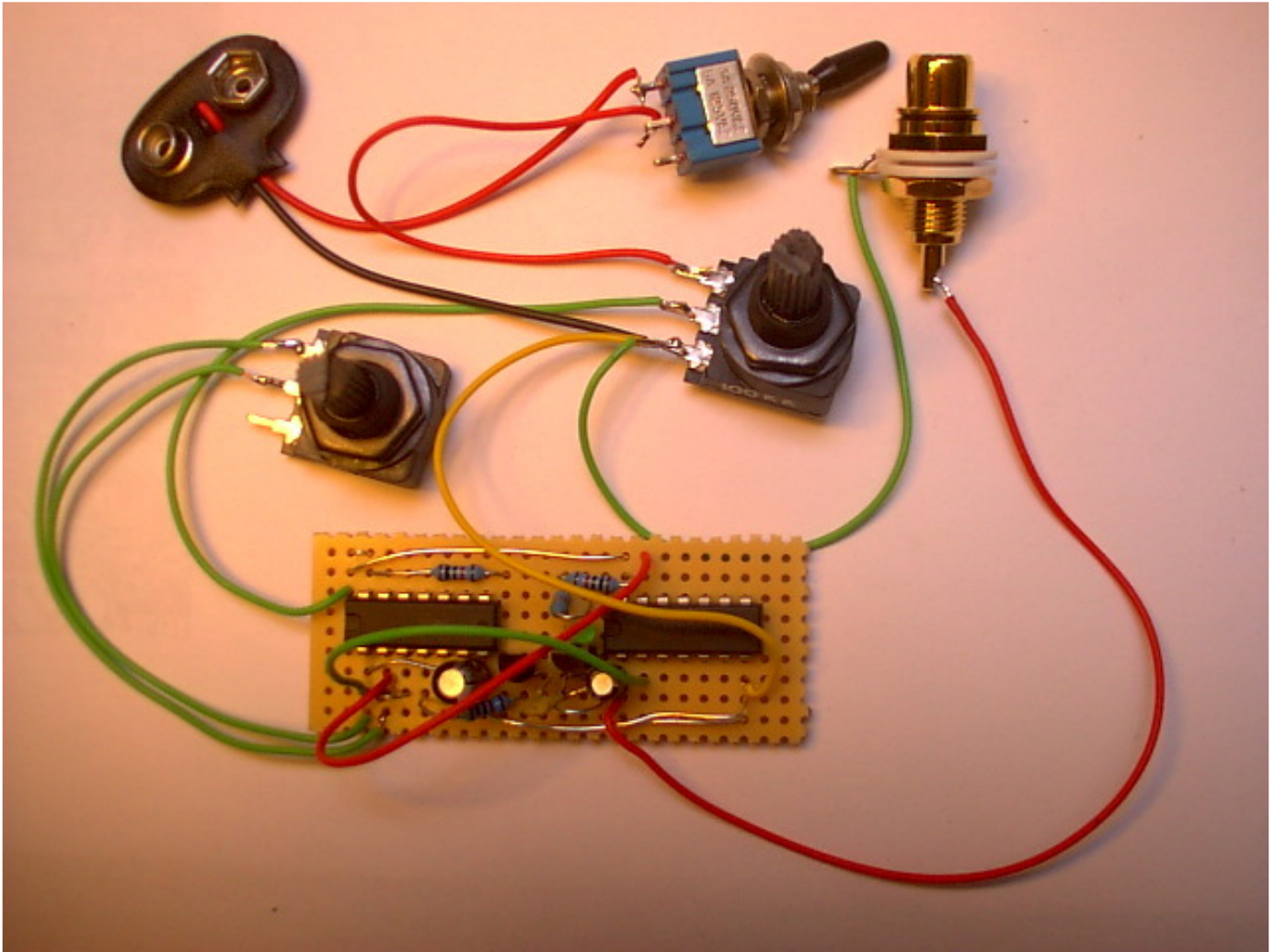


6] Using either bare or insulated wire according to taste connect pin seven (GND) of the 40106 to pin seven of the 4016. With a short piece of wire bridge pin 14 of the 40106 to the left strip (power). Connect pin 14 on the 4016 (power) to this strip. Connect pin one to the 40106 to pin two of the 4016 (feedback loop). Connect pin two of the 40106 to pin 13 of the 4016 (control switch). Connect pin three of each transistor together. Connect pin three of the second transistor to pin 7 of the 4016 (GND).



7] Prepare the 100K variable resistors (or potis) - on one place solder on all three terminals and attach 5 or 6cm insulated wire to the middle terminal. Do the same on the left and middle terminals of the second variable resistor. Solder the black lead of the battery clip to one side terminal of the first poti. Solder the red lead of the clip to one side of the on/off switch. Solder a 6cm insulated wire from the middle terminal of the switch to the other side of the first poti. Solder the wire attached to the middle of this poti to the power strip left of pin 14 on the 40106. Solder the two terminals of the second poti to pins one and two of the 40106 respectively. Solder a 6cm wire from the black (GND) side of the first poti to pin seven of the 4016.

8] Unscrew the potis and switch fittings and place these in position on the fish lid. Screw them in, tighten them and attach knobs. Screw the RCA connector in position and now solder on two wires - one to the centre (signal) and the other on the side lug (GND). Attach the signal wire to pin one of the 4016 and the GND additionally to the black wired side of the first power poti.



9] The fish tin is now ready for battery connection (9v) testing and playing. When placing the circuit in the tin, make sure to insulate the base of the tin from the board using the pink material.

10] Further customisations could include stacking up schmitt triggers using diodes across each 40106 gate, making more oscillators, using the same resistor and capacitor scheme, using more switches in the 4016 to switch distortion stages, replacing the 100K resistor with a variable resistor.

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