

Telephone Pieuvre

The idea is to realize a telephone like in the film Brazil of Terry Gilliam:



L'idée est que le numéro de téléphone est composé en enfonçant des fiches dans des prises.

Les branchements réalisés codent pour le numéro de téléphone qu'on veut composer. Une fois les branchements réalisés, le numéro est réellement composé au moment où on appui sur un bouton/levier. Chaque trous sur le cadran représente un chiffre. On peut brancher une ou plusieurs fiches dans les trous, car les fiches sont superposables (ce qui résout le problème d'avoir plusieurs chiffres identiques). Les fiches sont numérotées, et lors de la composition du numéro, elles seront interrogées dans l'ordre de leurs numéros.

Par exemple, pour numéroter 06 77 25 64 85, on branche la première fiche sur le trou 0, la deuxième sur le trou 6, la troisième sur le 7, la quatrième sur la troisième etc. Puis on appui sur un bouton pour déclencher la numérotation.

1. The casing

I used an old touch tone telephone:



To this date (04/2012) the project looks like:



Figure A number is composed



Figure one wire



Figure Side view



Figure My number is composed

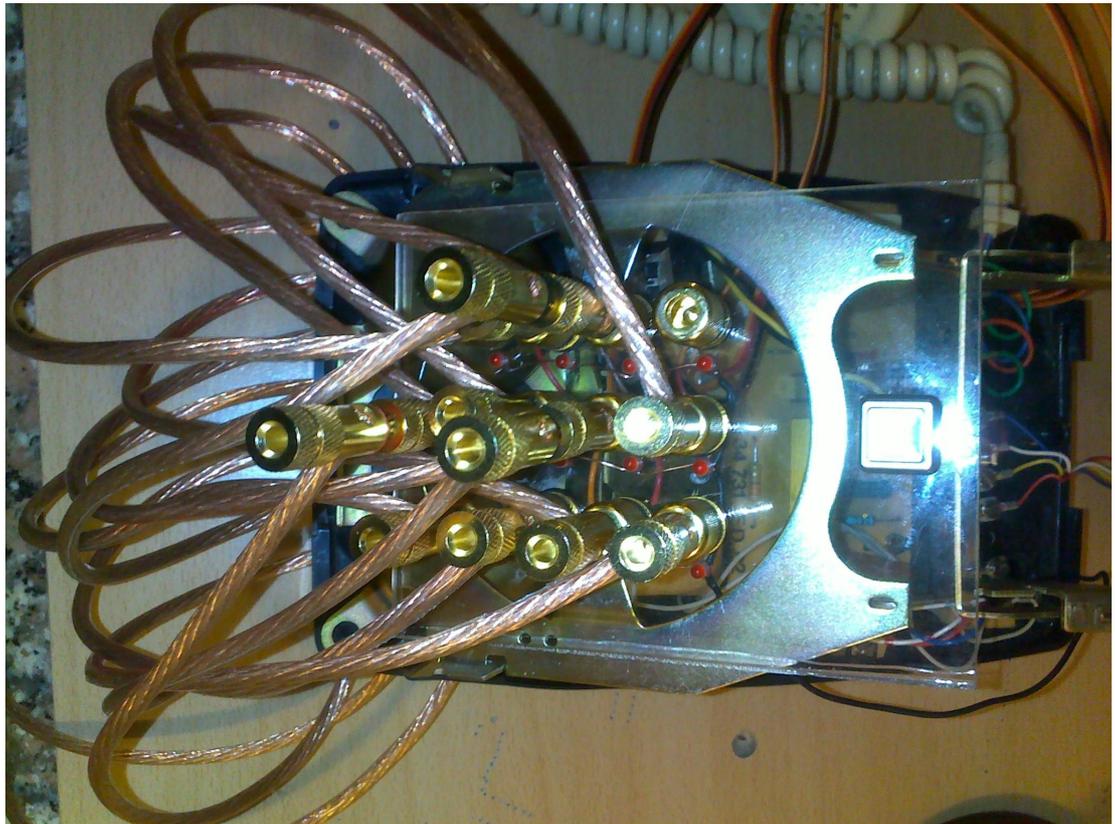


Figure Top view

The electronic is contained in the two black boxes underneath. I want to complete it with some fancy-looking metallic parts soldered on top to hold the receiver.

2. Electric schema

Global view

Here is a global view. I used the KiCad software under Ubuntu for the schema and the realization of the boards.

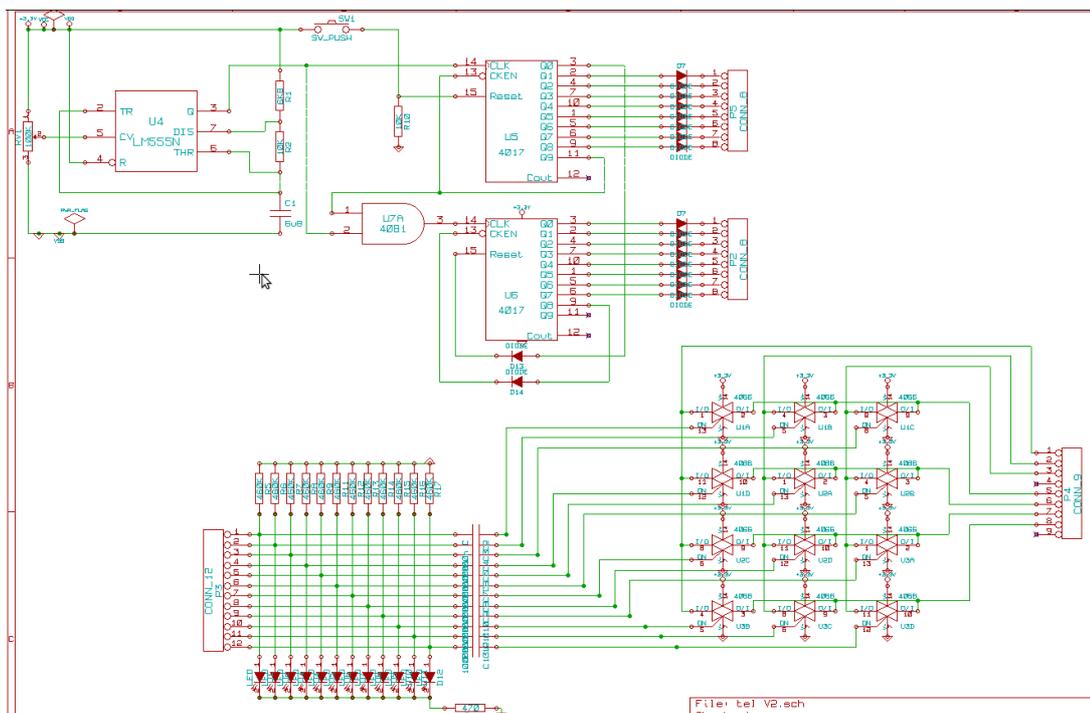


Figure schema of the global view

The Coder

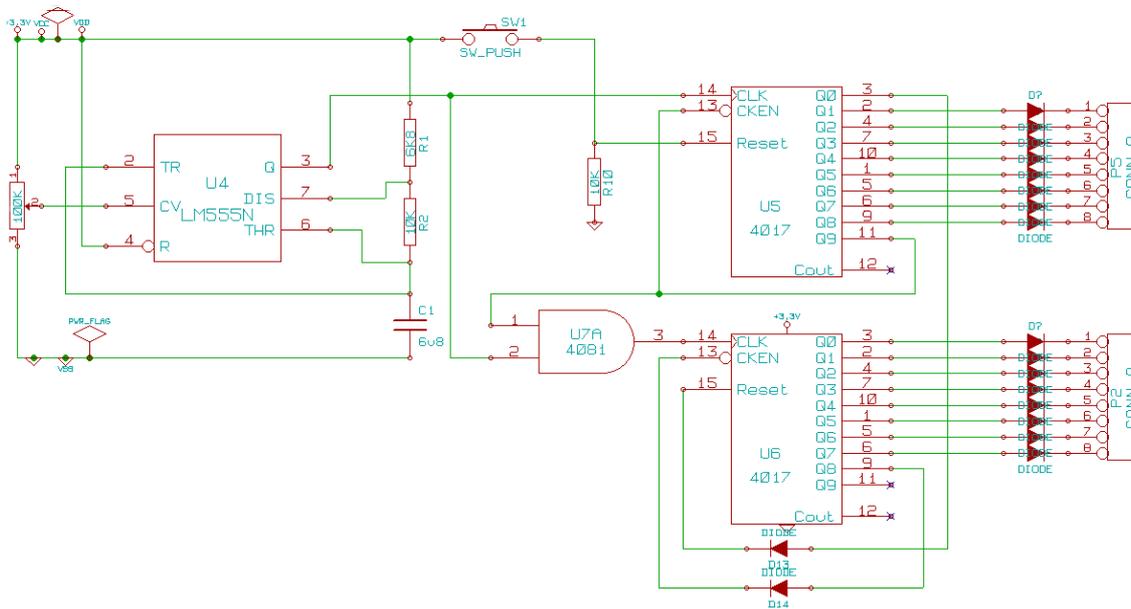


Figure schema of the coder

The idea is to send a pulse successively to each output wire, in sequence, when you press the SW1 button (the square grey button).

This is a simple counter. The 555 generates impulsions (the speed is adjustable); whereas the two linked 4017 count them and send an impulsion successively on each output. The outputs P2 and P5 are connected to the 16 golden wires that go out of the bottom of the telephone. The diodes avoid having a returning signal for the case when two outputs are connected together (this can happen if you want to digit a phone number that contains twice the same figure).

The transceiver

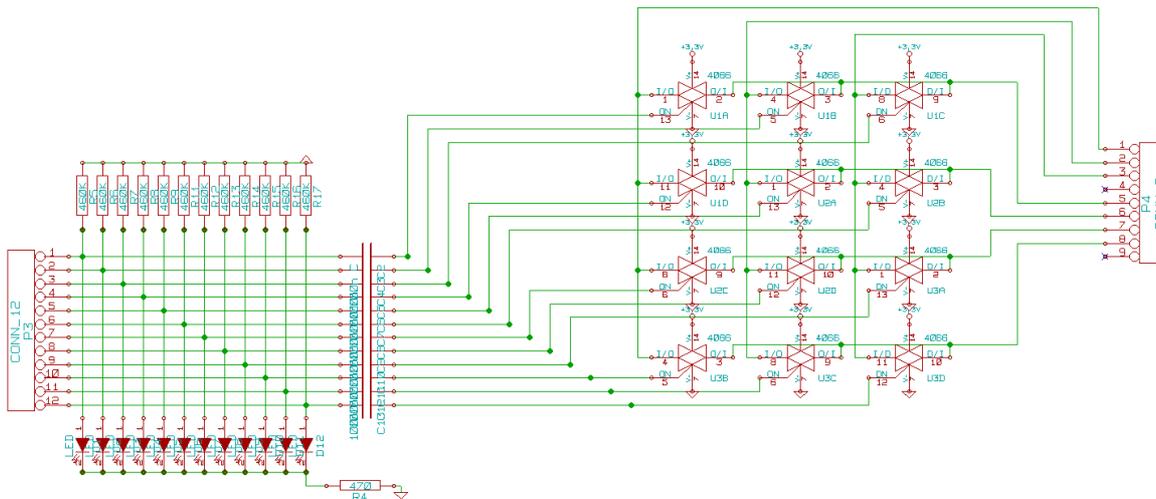


Figure Schema of the transceiver

The input of the circuit P3 is connected to each plug holes on the telephone plexiglass board. When a wire is connected, it lit a LED D1 to D12 (as seen on the prototype board) to allow the user to visualize the number dialed. The impulsion is then shaped by a high-pass filter with the RC bridges, to simulate the brief pressing of the telephone digits. We obtain a brief impulsion (0,05s nearly). This impulsion is then carried to three 4066 circuits. These circuits act like simulated switches: if a high state is receiver on the trigger, it will close the circuit between the two other pins.

I then wired the outputs of the 4066 exactly on the previous contacts of the telephone keypad, to simulate how the number was dialed by a person.

3. Realization

The circuit has been routed with KiCad and printed on an electronic board using the ironing method: <http://www.riccibitti.com/pcb/pcb.htm>

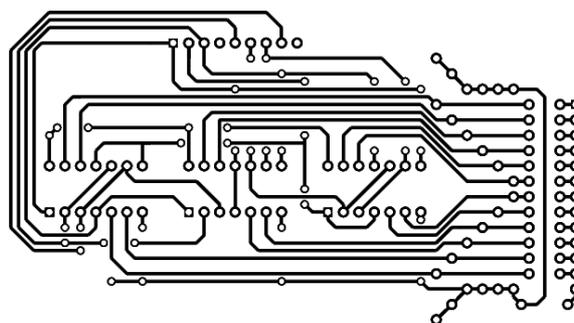


Figure PCB of the coder

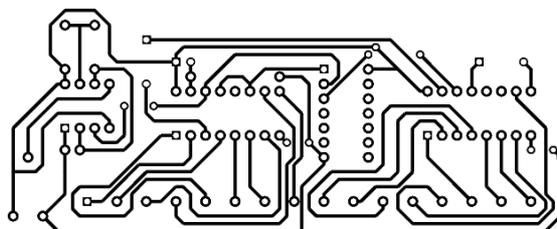


Figure PCB of the transceiver

The two electronic boards are powered with 3 Volt that I take directly from the telephone (no need for battery): There is a big capacity in the original circuit: 470 microFarad. I supposed that this is used to stabilize the phone line current, so I take the + and - at its legs.

See <http://radioham.free.fr/sites/telephon.htm> for information on the line currents.