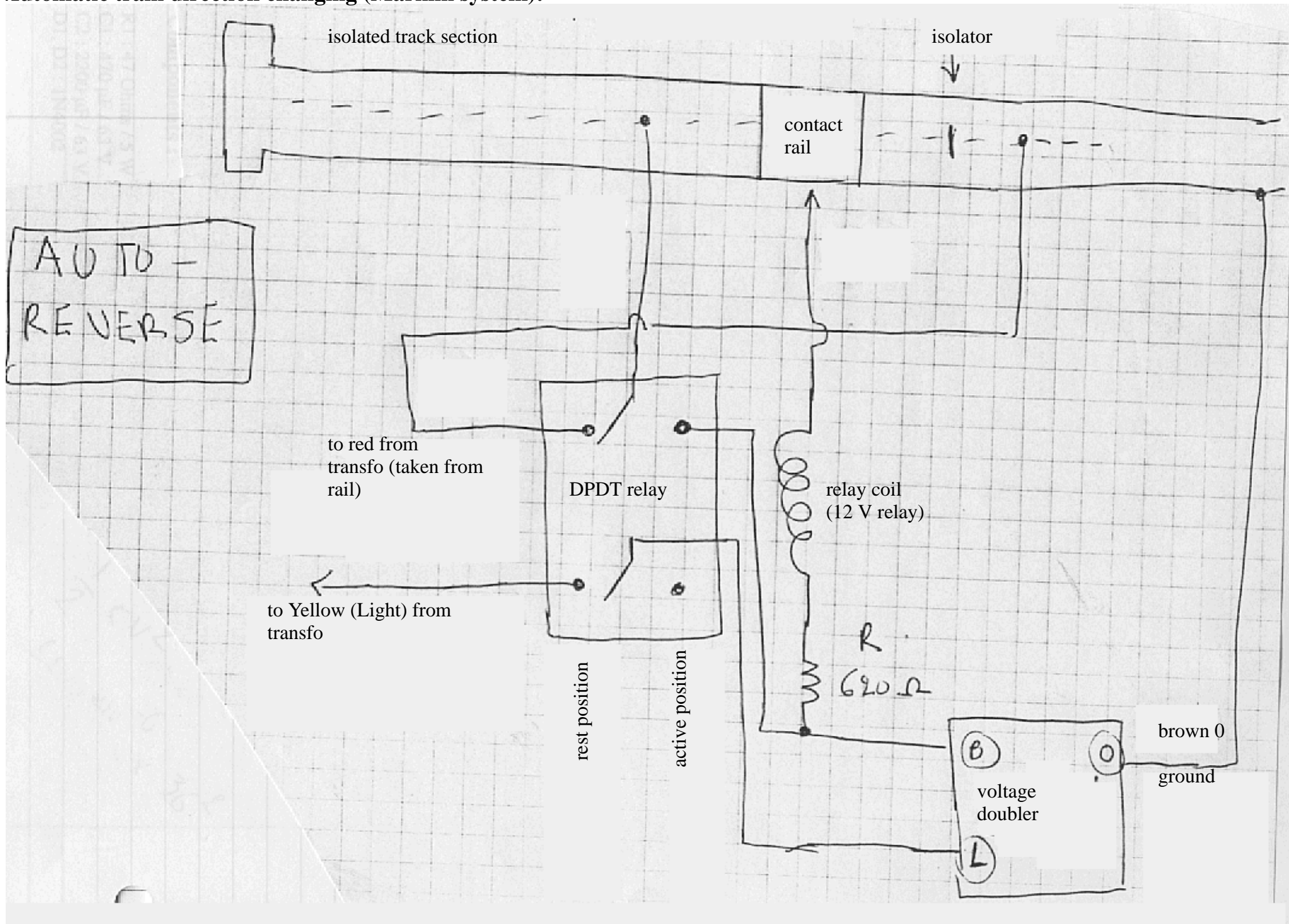


# Automatic train direction changing (Märklin system):



## **Principle:**

*at rest:*

- isolated track receive the 'red' power, the train comes in.
- the voltage doubler circuit is connected to the light output and the capacitor is charging itself to 40 VDC

*When the train passes on the contact rail:*

- the isolated track receives now 40 VDC so that the trains change direction
  - the relay is powered at 40 VDC
  - the voltage doubler circuit is disconnected from the transformer light output so that the capacitor discharges itself to 0 VDC.
- At this point we are back to the rest position and the trains leaves in the opposite direction.

This works extremely well and is easy/cheap to build.

To have use it on a line track (with changing directions at both ends, one circuit is enough, it is plugged the same way to the contact rail at the other end. This way, the train will go back and forth from both ends of the line.

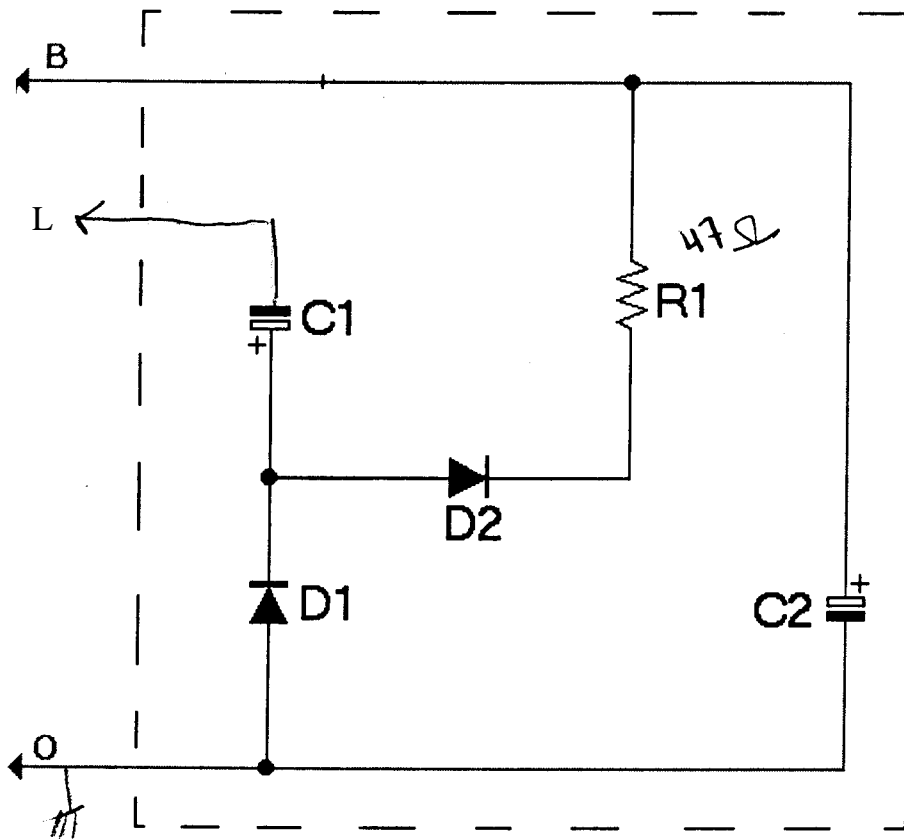
The voltage doubler circuit comes originally from: <http://www.esiee.fr/~vannelf/train.html>

# VOLTAGE DOUBLER CIRCUIT

## Direction Changing Mechanism

(for Märklin 3-track system)

Change the direction of your train when you want, where you want. This system can only be used with HO Märklin system (Conventional, Delta, Digital). That works like the Märklin controller: it changes the direction as when you turn the controller switch to the left. Moreover this system allow you to do that automatically or by pushing a button.



### Components :

R1 : 47 Ohms / 5 W

C1 : 470  $\mu$ F / 63 V

C2 : 2200  $\mu$ F / 63 V