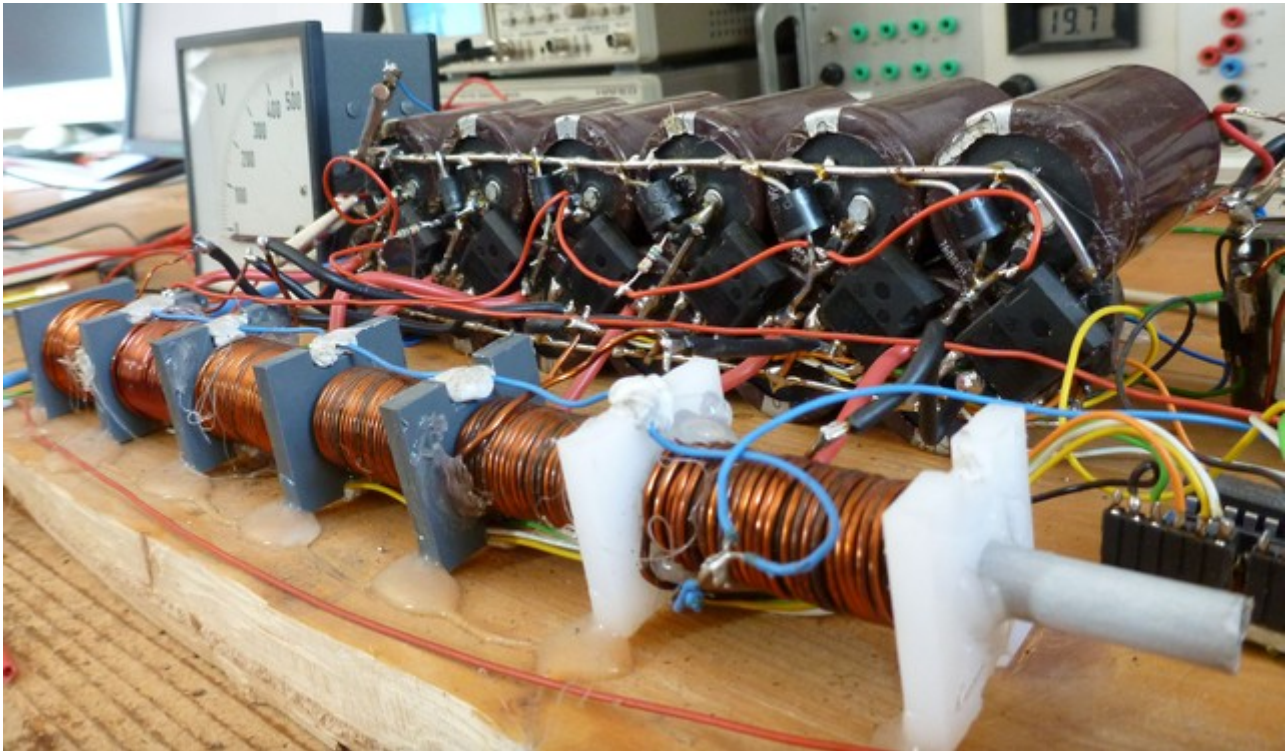
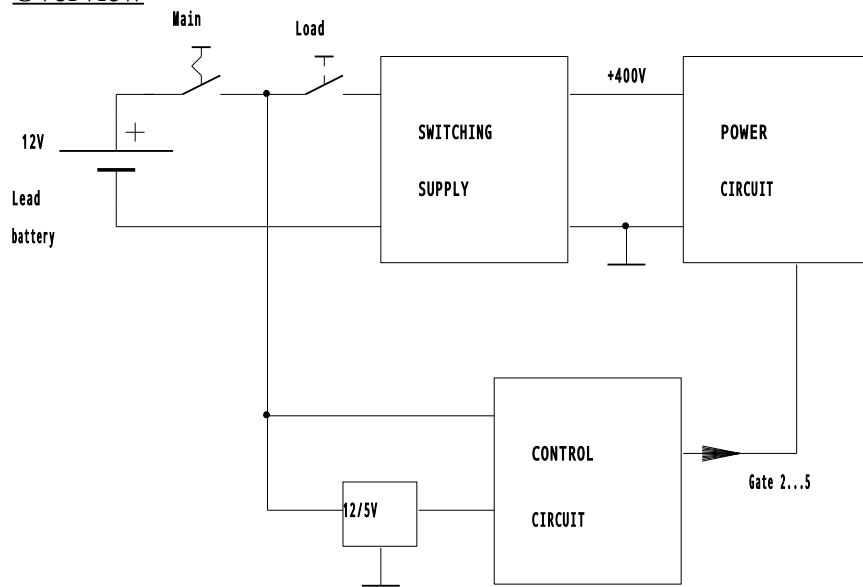


Michel's coilgun



Overview

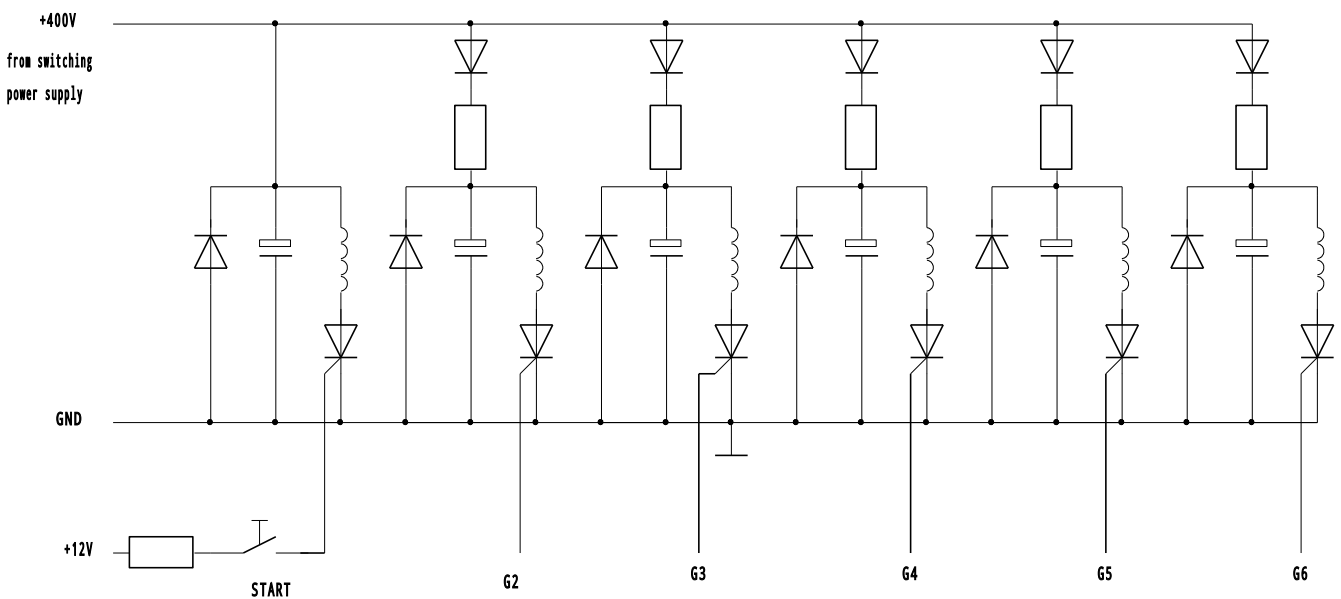


Coil dimensions

Coil Nr	1	2	3	4	5	6
Wire diameter in mm	0,9	1,1	1,3	1,3	1,3	1,3
Coil diameter in mm	26	25	23	21	18	17
Coil length in mm	34	34	34	34	34	41,5
R/mΩ	1000	230	115	92	68,4	75,8
L/μH	1300	240	100	65	36	35
$\tau = L/R$ in μs	1300	1043	870	700	530	460

Tube dimensions:
 inner diameter: 6mm
 outer diameter: 8,5m
 length: 270mm

Power circuit

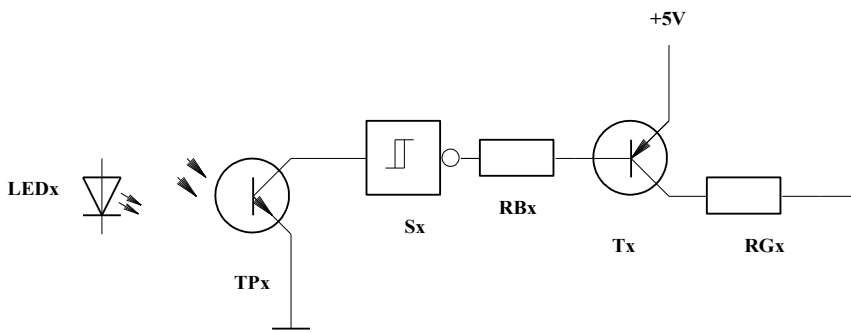


All resistors: 56-82Ω
 Upper diodes: 1N4007
 Flyback diodes: P600M (1000V / 6A) *)
 Capacitors: 2 x 470μF / 400V per coil

*) current peak goes up to more than 1000A, but only for a short time, so 6A diodes can survive

Control circuit

the control circuit contains 5 photoelectric barriers, one of these is shown here:



LED2...LED5: IR LEDs connected in series with 330 Ω to 12V

TP2...TP5: photo transistors (type not critical)

S2...S5: TTL schmitt trigger 74LS14 powered with +5V

RB2...RB5: 1k Ω

RG2...RG5: 33 Ω

Note: eventually connect a diode in series to RBx (with anode to base of pnp transistor) to make sure that Tx is sure to block when output of Sx is high.