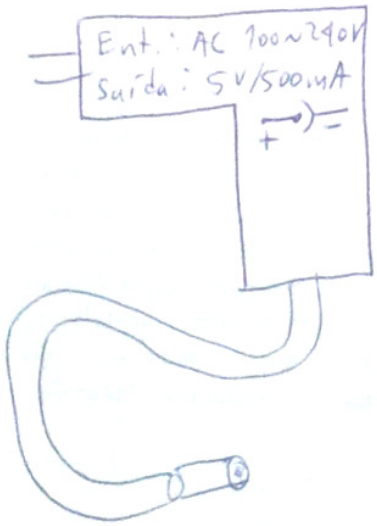
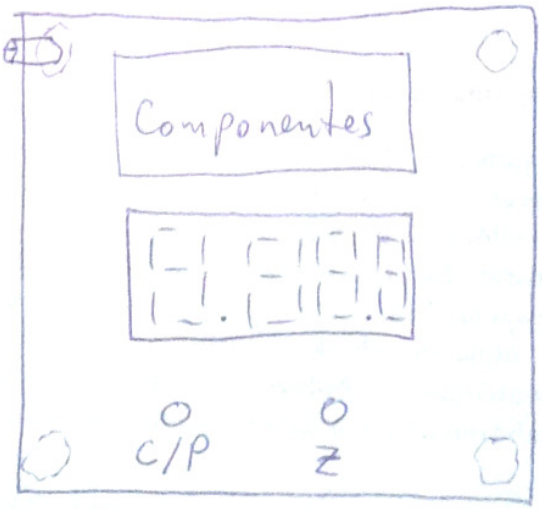
Cronômetro Digital Didático

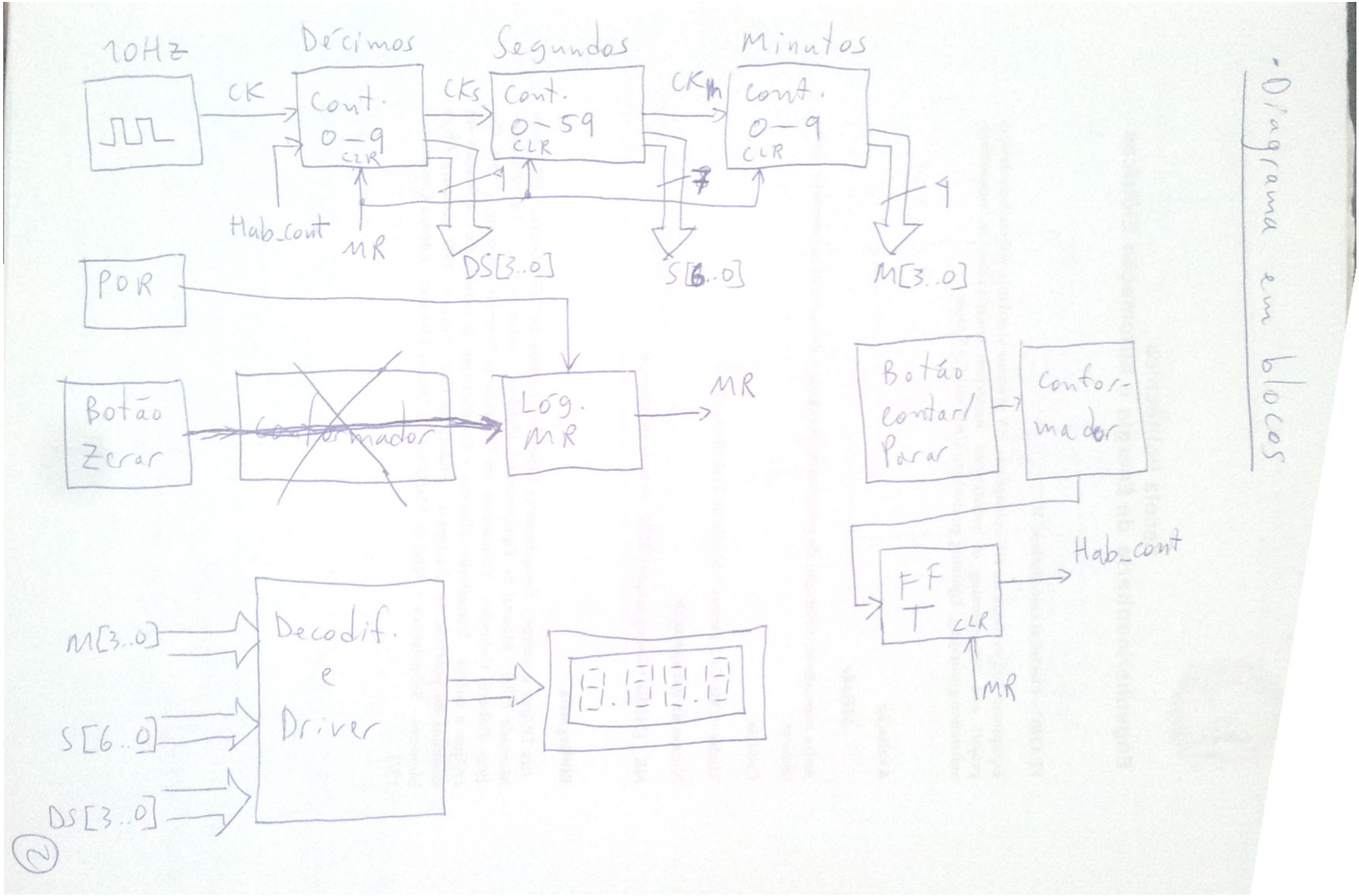
Décimos de Segundo a Unidades de Minuto

- Características:
  - Fonte externa: 5V/500mA (+ —)—
  - Botão de contar/parar
  - Botão de zerar
  - Gerador de base de tempo pouco preciso (com 555)
  - Ao energizar, inicializa com 0:00.0
- Aspecto físico:



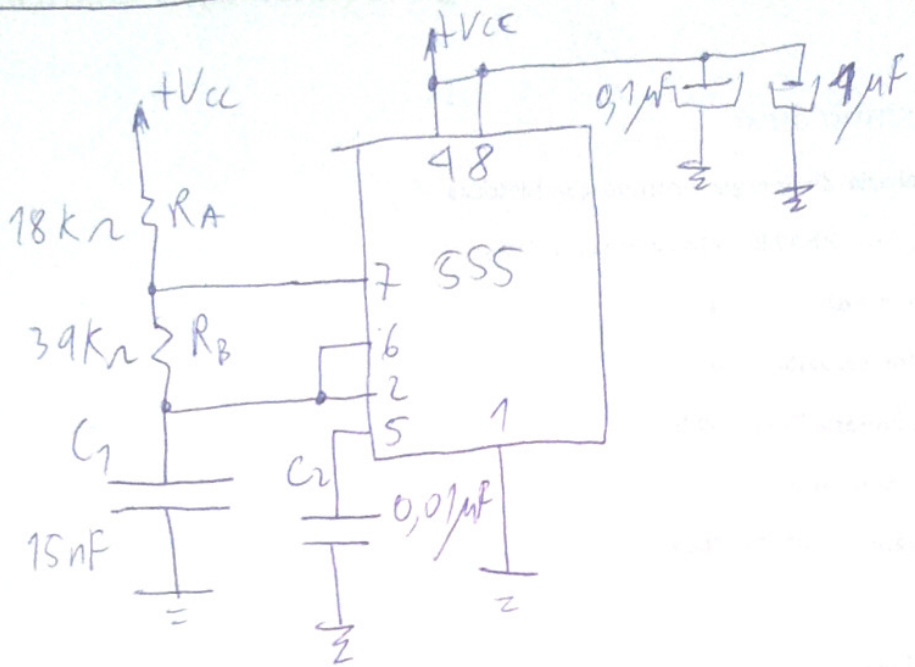


• Diagrama em blocos



• trechos esquemáticos e memória de cálculo

oscilador de 10 Hz



→ Ref.: National Semiconducter

$$f = \frac{1,44}{(R_A + 2R_B)C}$$

P/ C = 15 nF:

$R_1 + 2R_2 = 96\,k\Omega$

P/ $R_1 = 27\,k\Omega$:

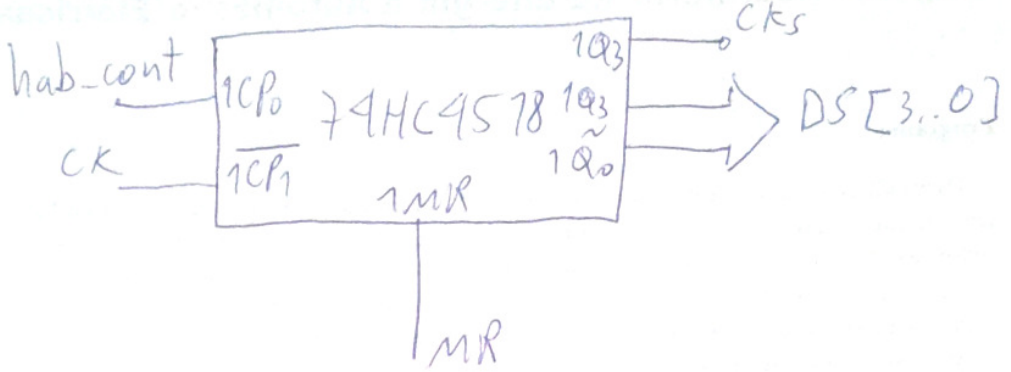
$R_2 = 33\,k\Omega$

$\therefore f \cong 10,3\,Hz$

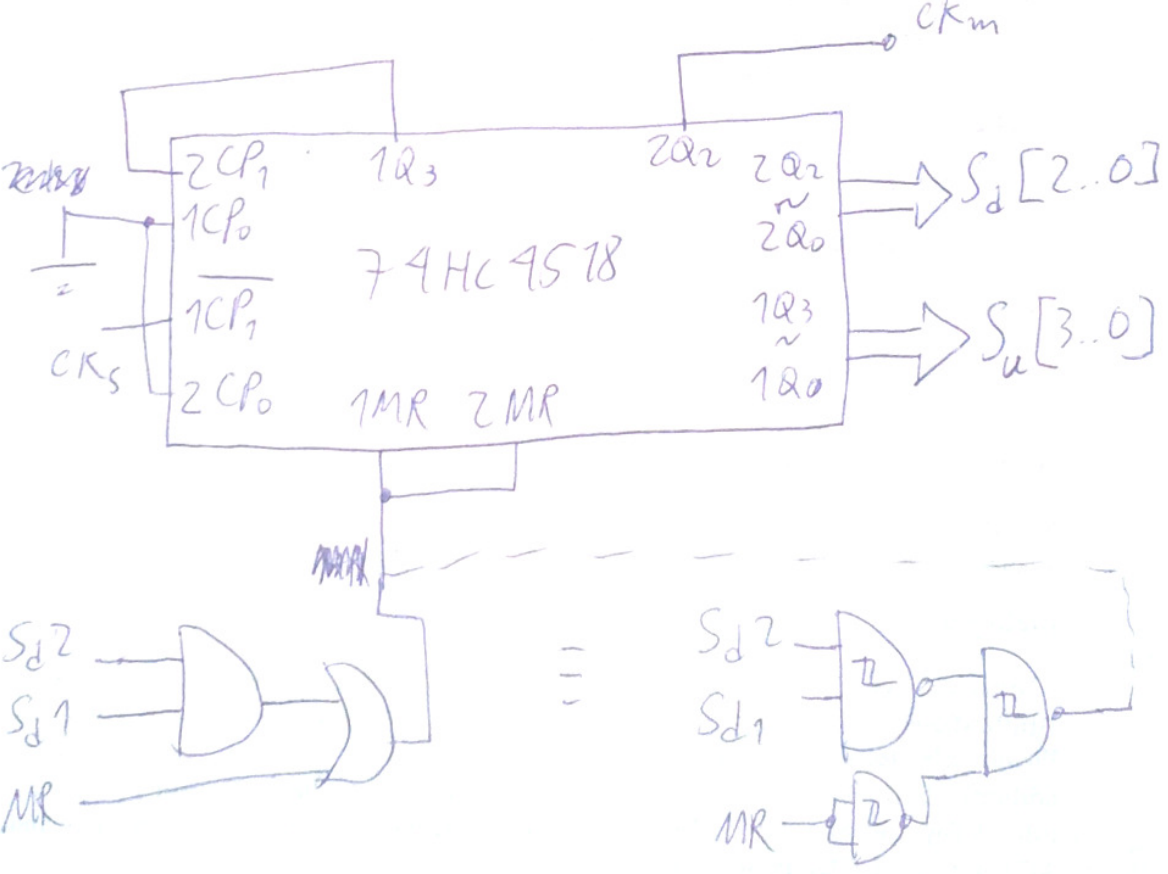
P/ { C = 15 nF / 16V
$R_1 = 18\,k\Omega \pm 5\%$ / 1/8 W
$R_2 = 39\,k\Omega \pm 5\%$ 1/8 W

$f = 10,0\,Hz$ (com valores nominais)

Cont. Décimos de Segundos

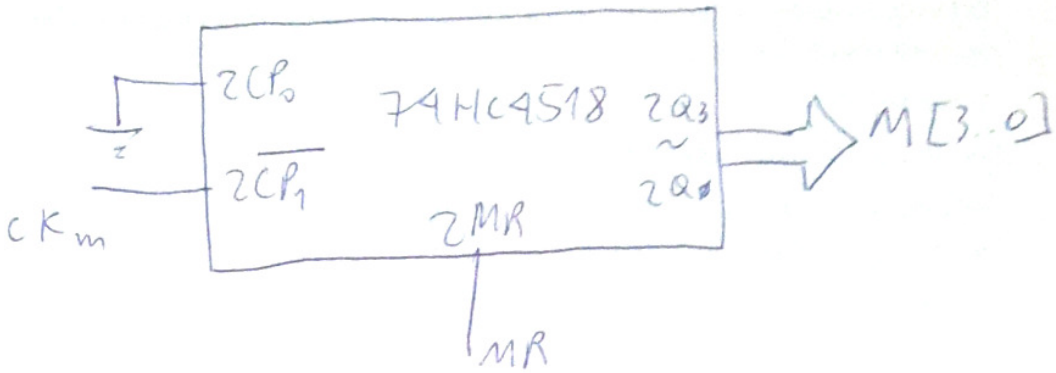


Cont. Segundos

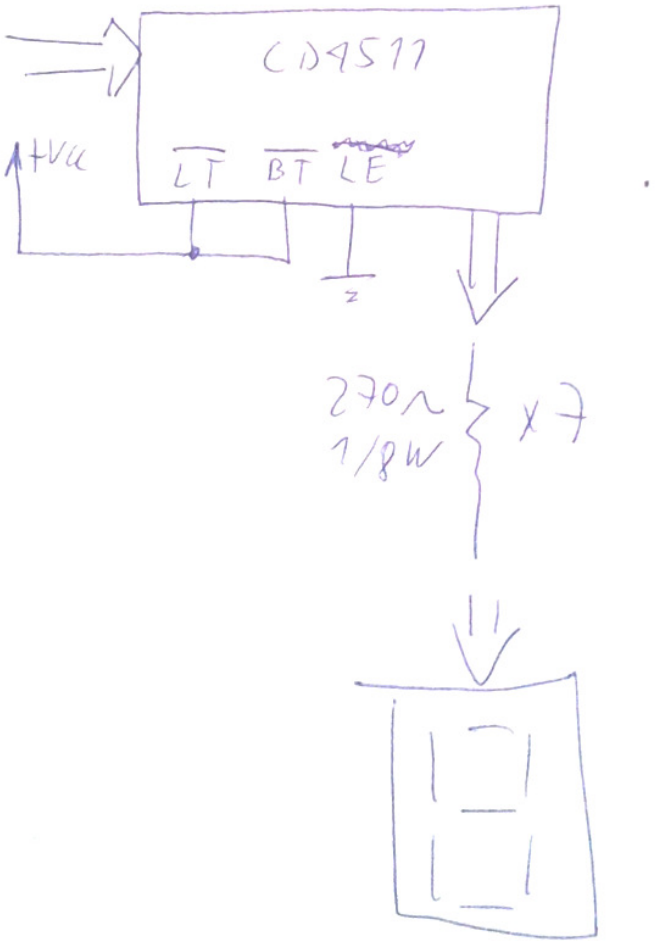


$$S = \overline{\overline{AB} + C} = \overline{\overline{AB}\,\overline{C}}$$

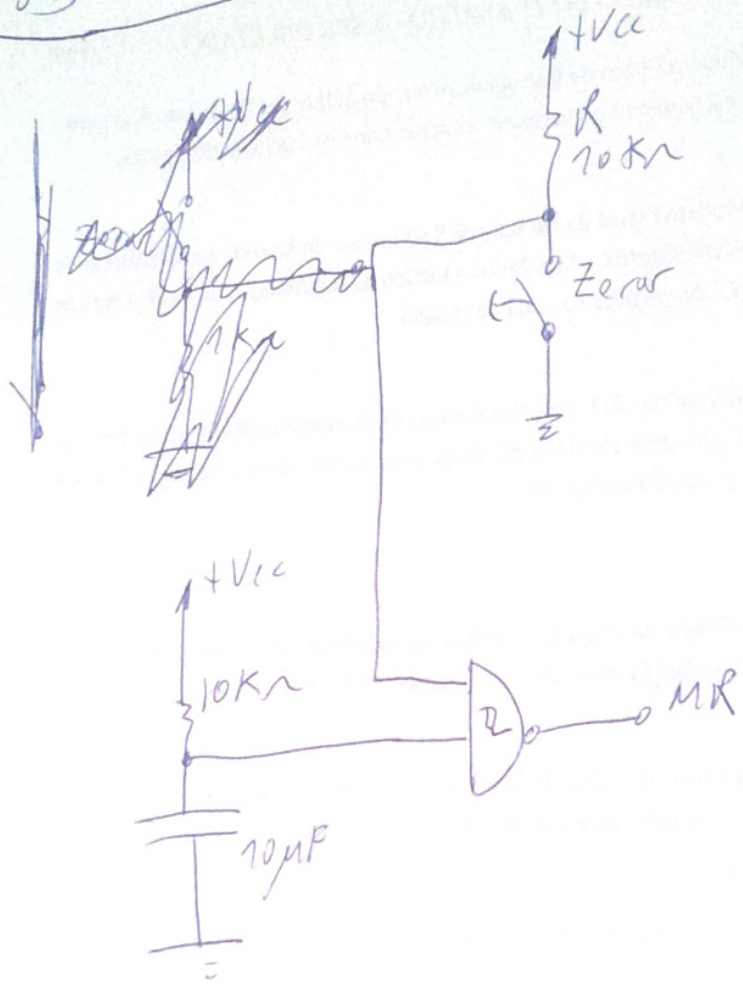
Cont. Minutos

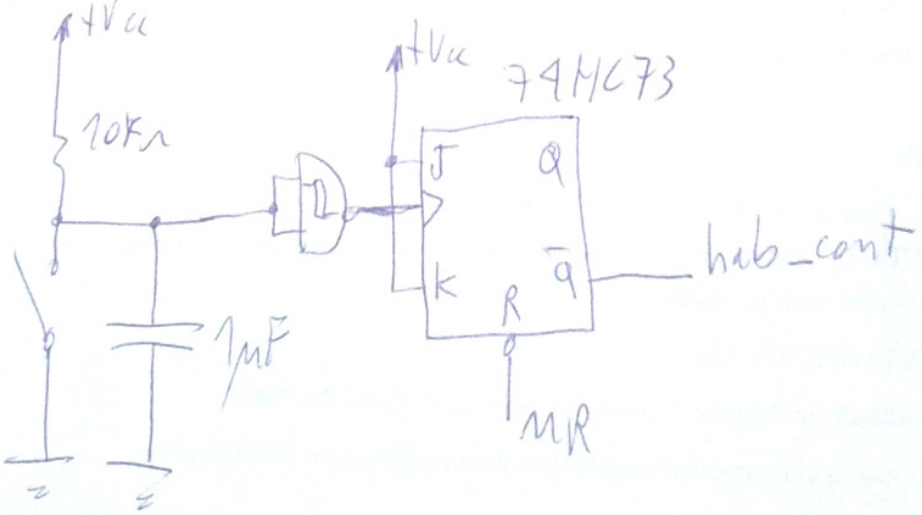


Decodif., Driver e Displays



Botões e POR :


+Vcc
R
10KΩ
Zerar
+Vcc
10KΩ
MR
10μF


+Vcc
10KΩ
+Vcc
74HC73
J
Q
K
R
Q̄
hab_cont
1μF
MR