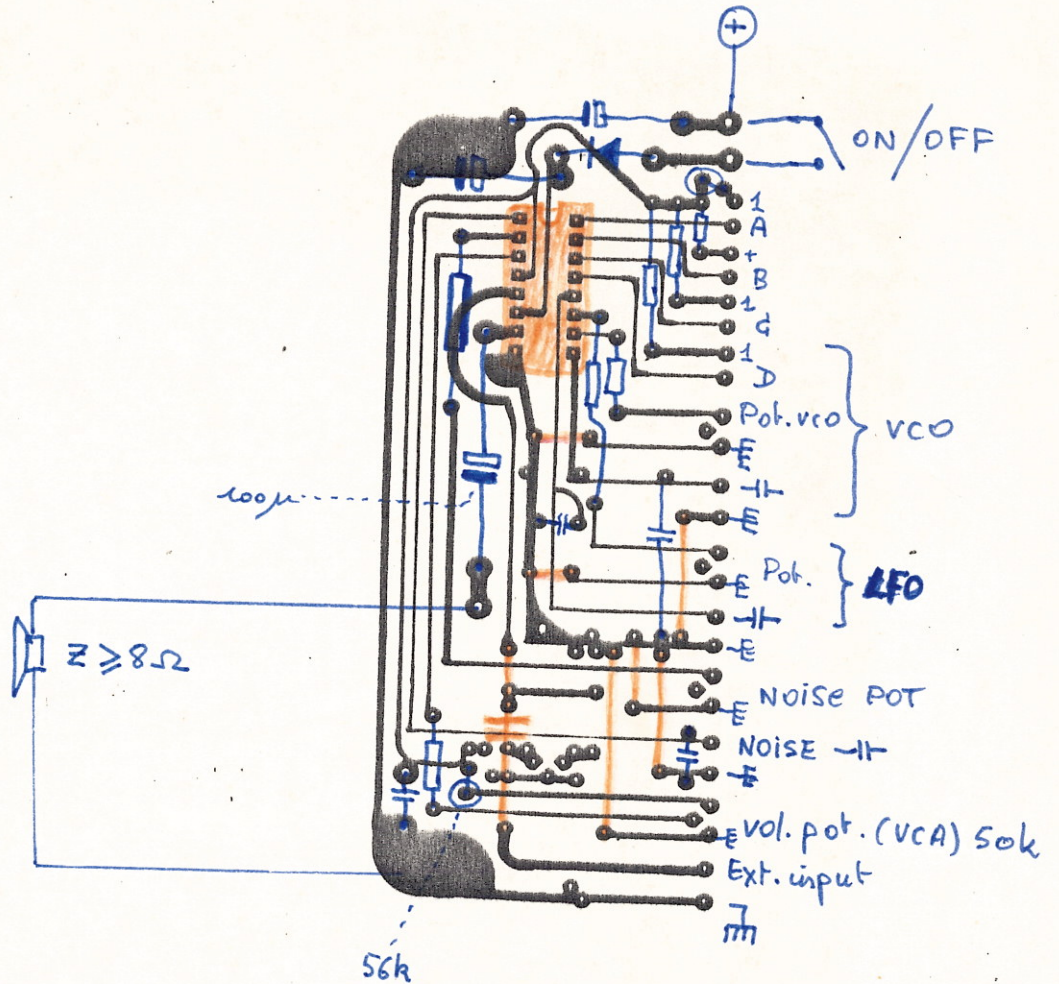


Synthelogg

Mini VI - modul

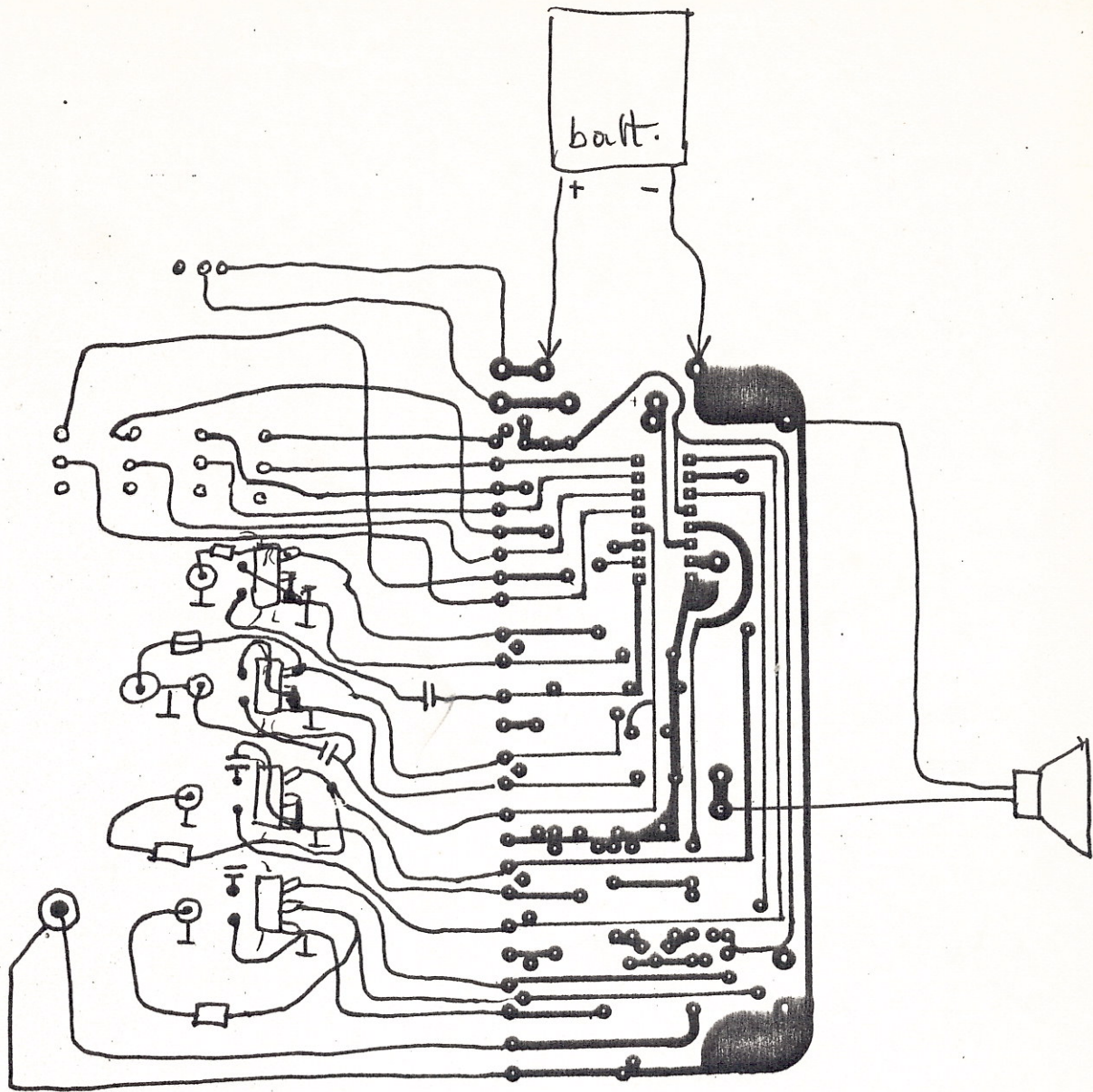
# Synthelog VI bestukking



Print bestukking  
anoderdelen zijde

IV godel  
slubom-i

48.50

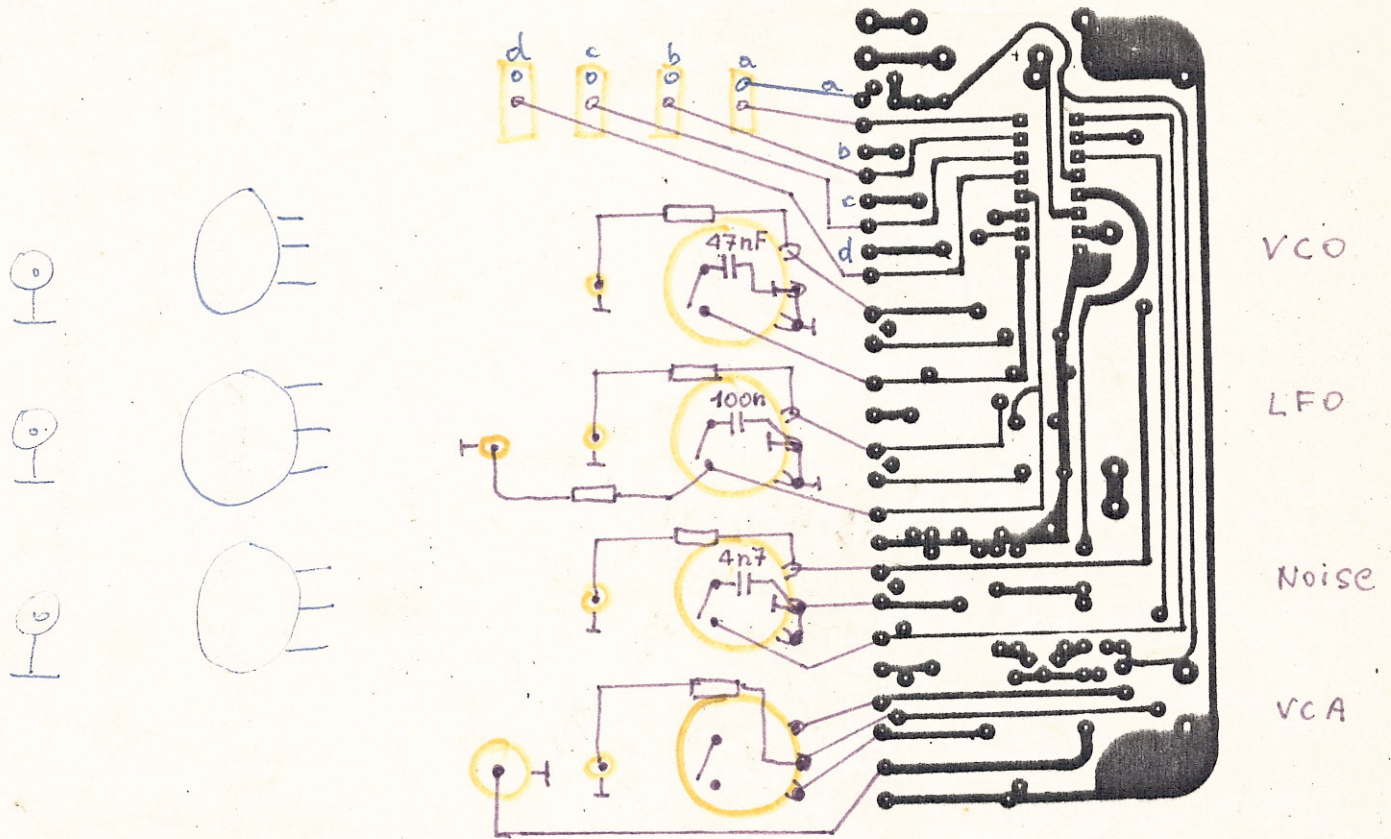


binnen aanzicht. (opengevouwen)

# Synthesizer VI mini-module

02.84

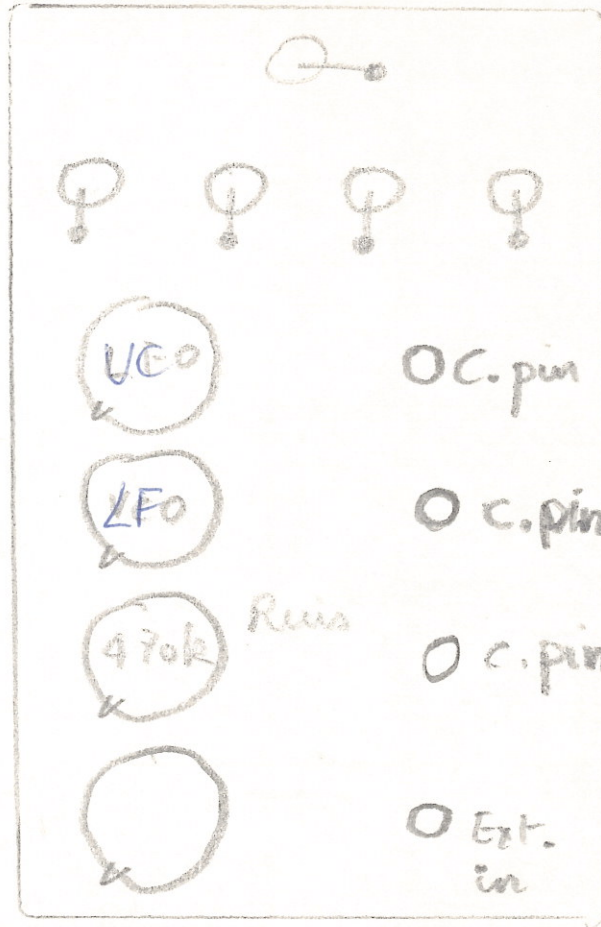
# Kablieringsplan

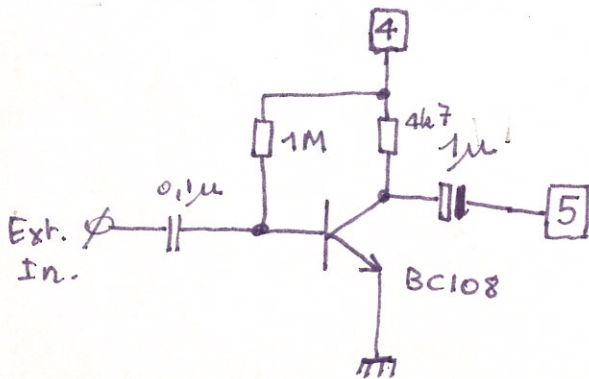
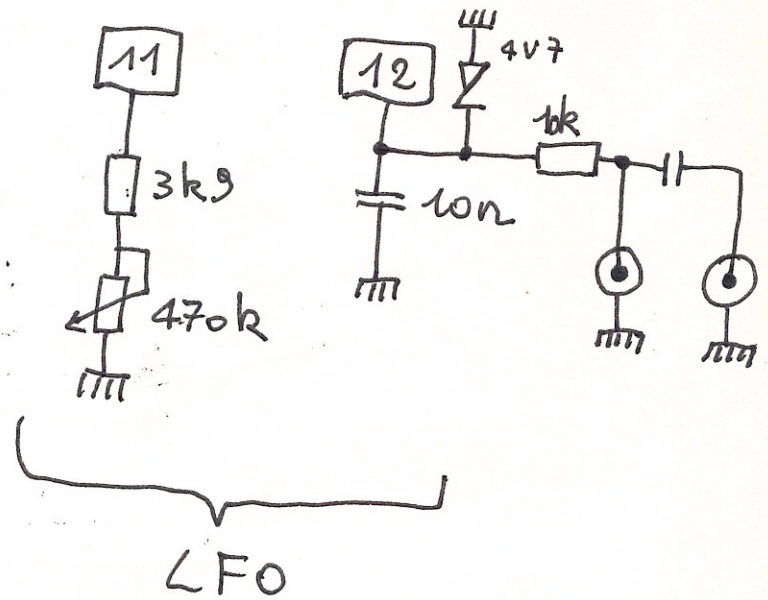
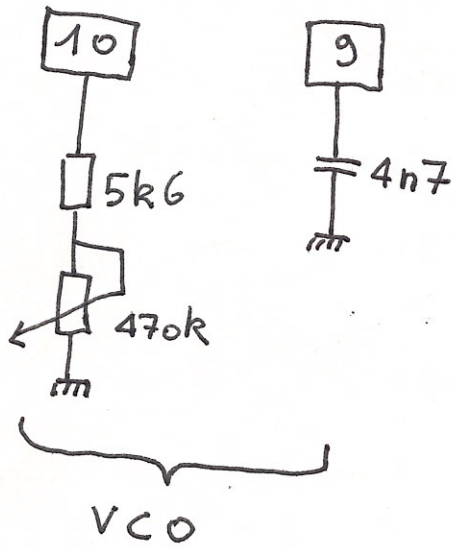
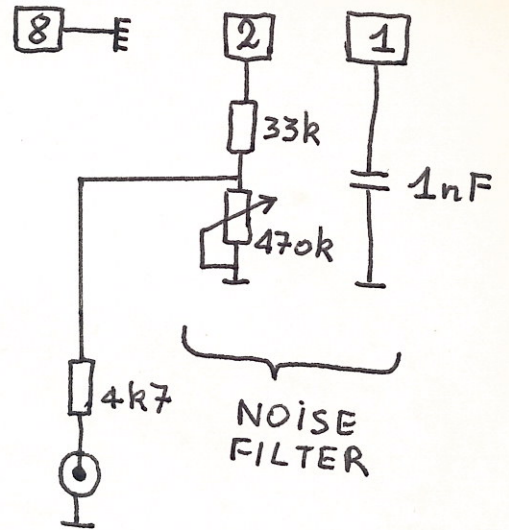
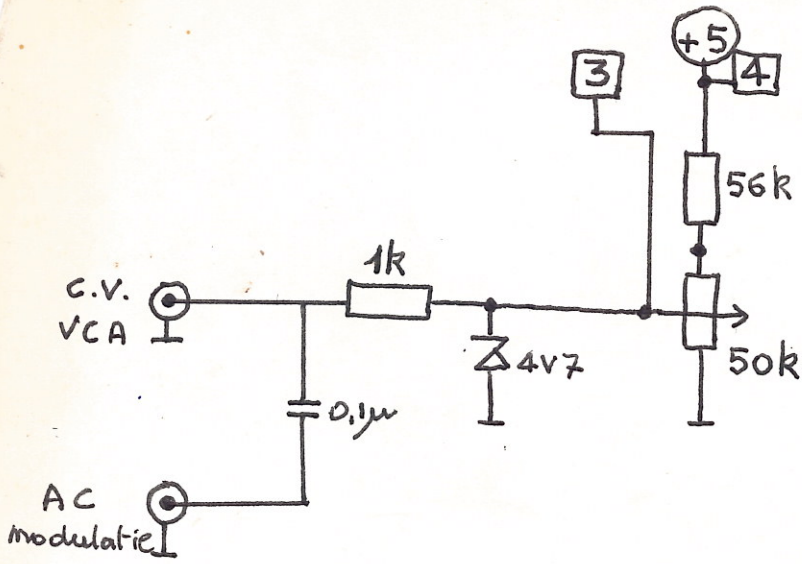


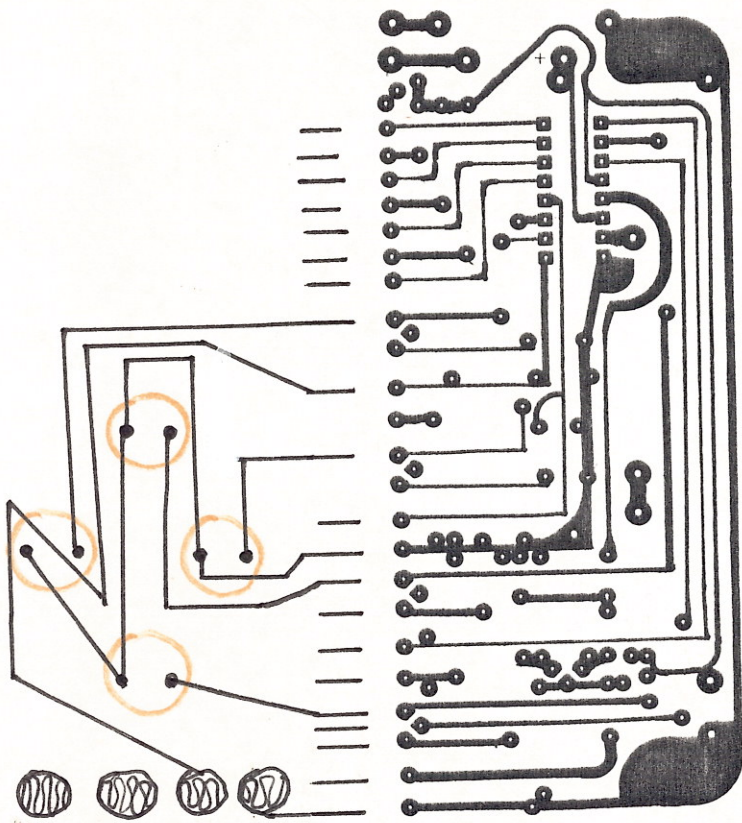
alle R = 10k $\Omega$

helog VI  
i-module

3 pot. 470k



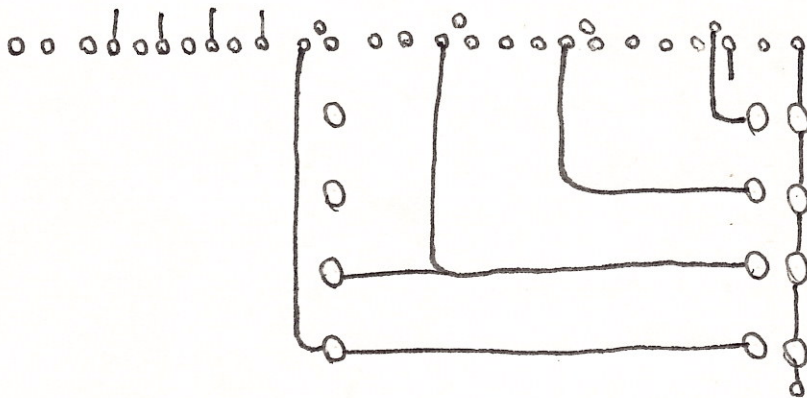




Synthelog VI  
mini-module

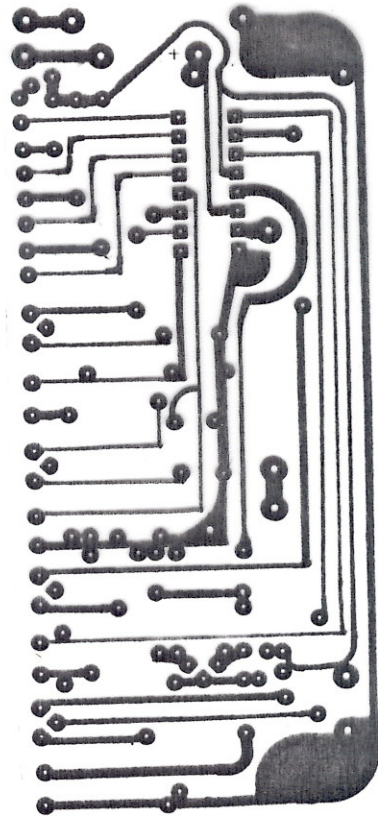
02.84

Schrijf pot front



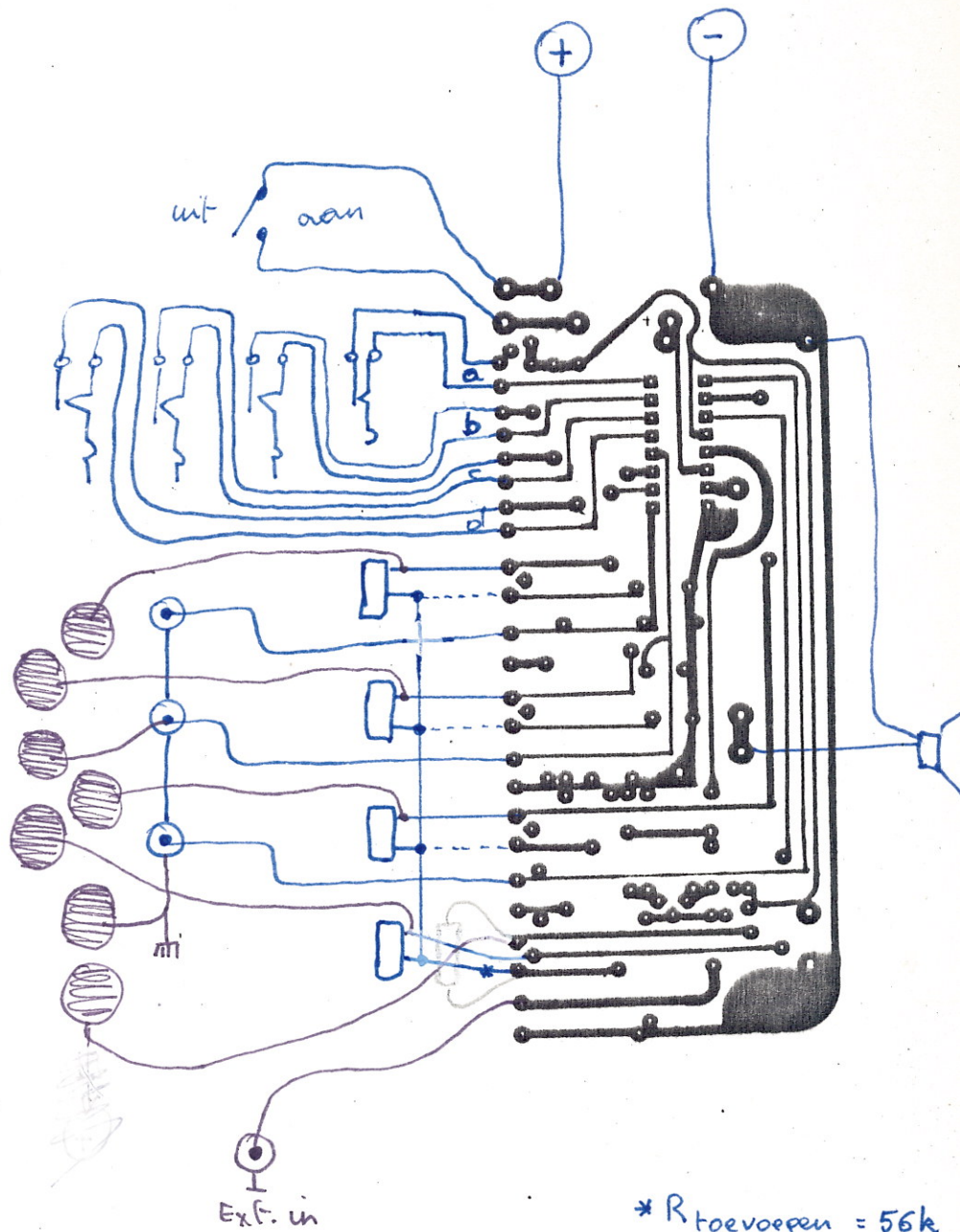
Handwritten signature or scribble.





helog VI  
i-module

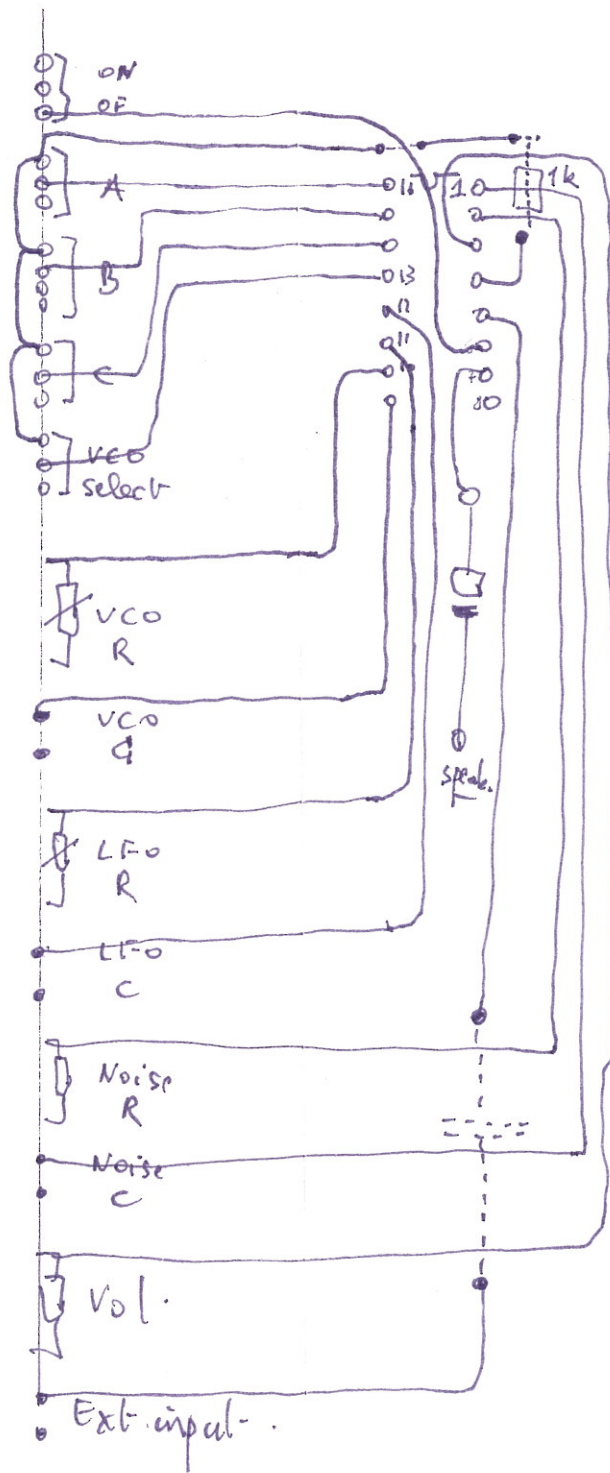
02.84

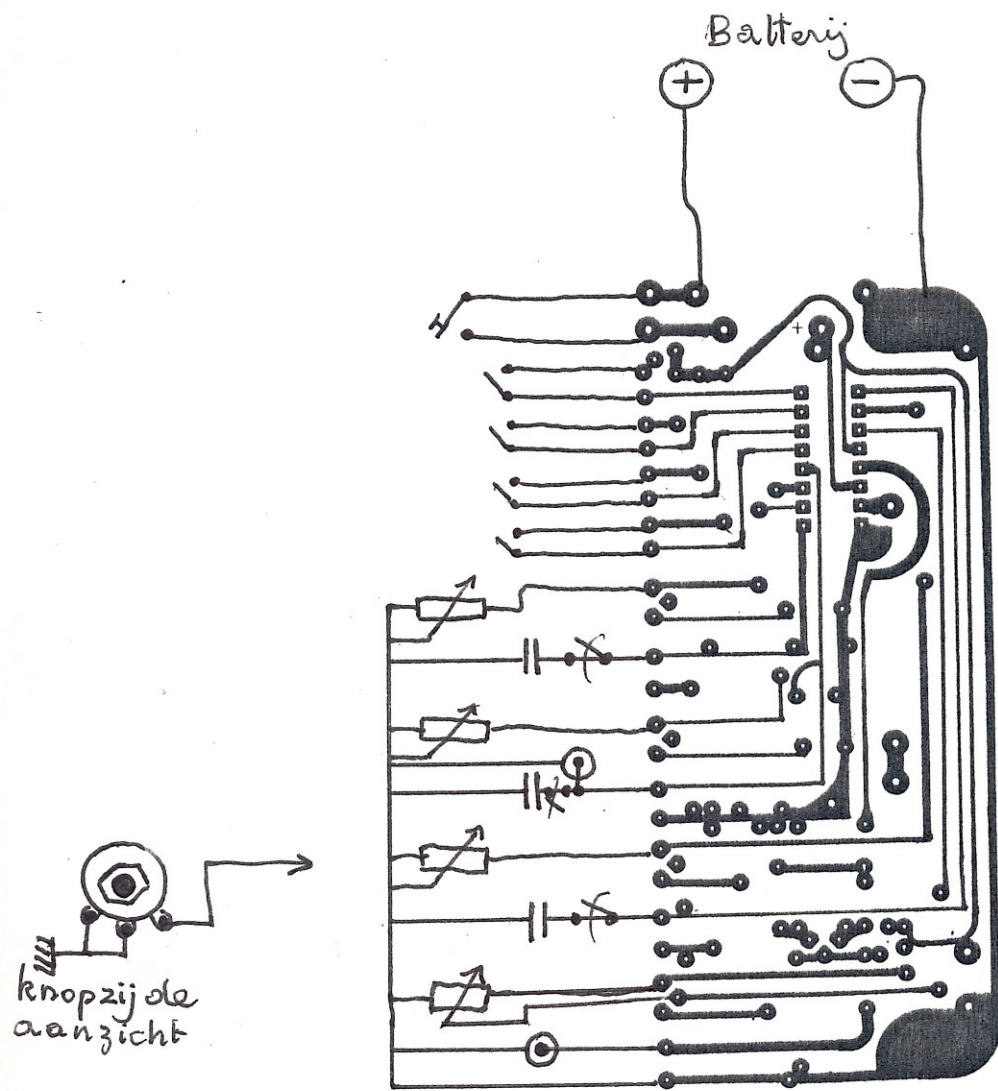


\* R toevoegen = 56k  
ofwel Zener 2V7

LDR &  
voelvlak  
versie

helog VI  
i-module





Koperzijde  
print

# Synthelog VI

## mini-module

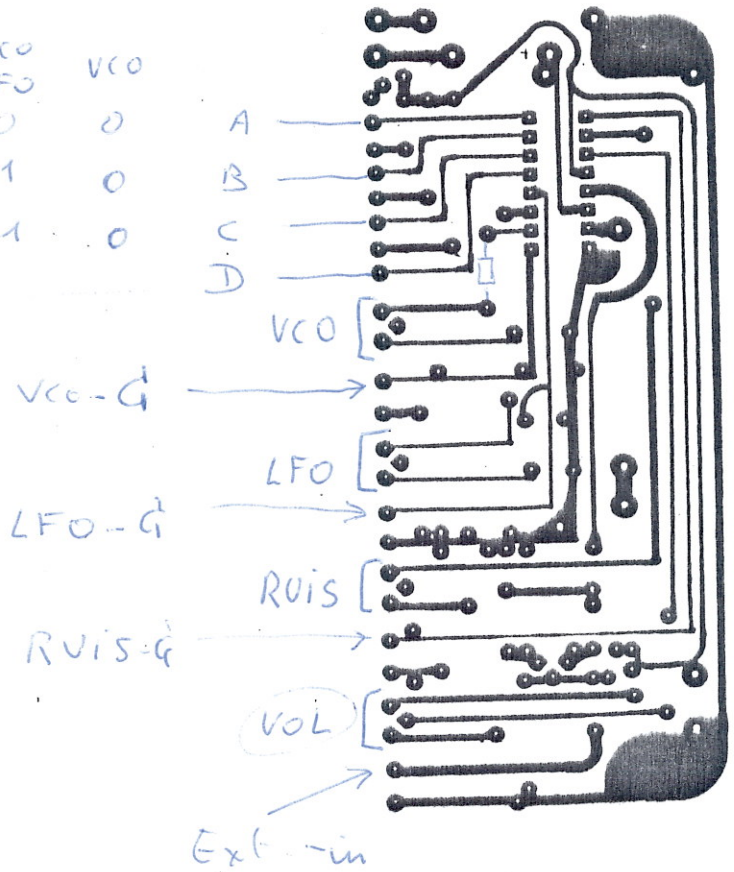
02.84

magje : +5-vastheit  
 logische niveaus  
 mixer.

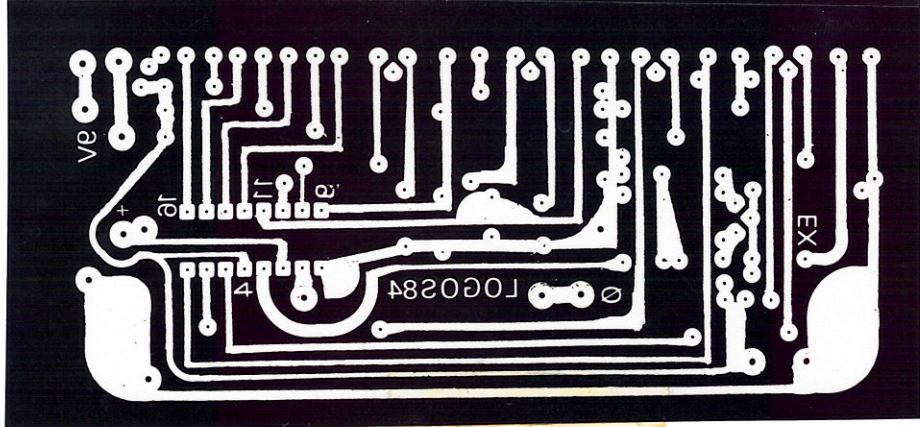
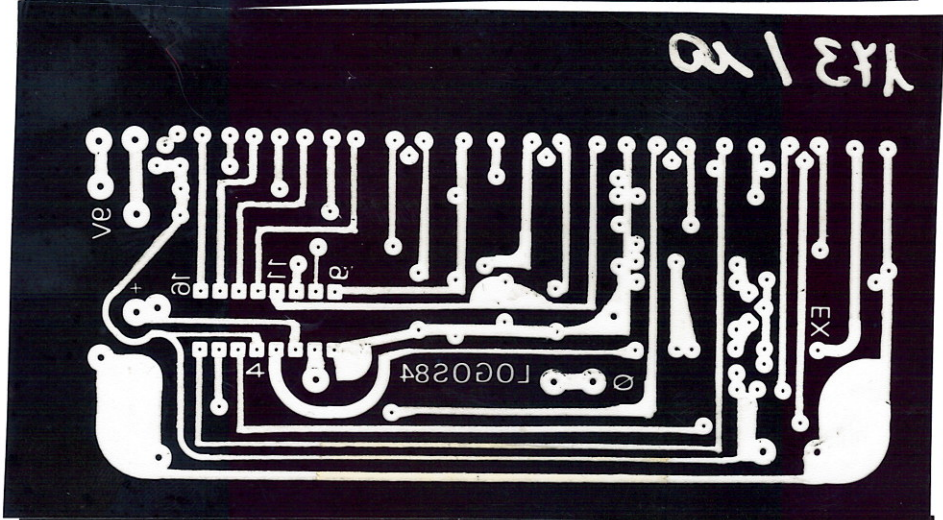
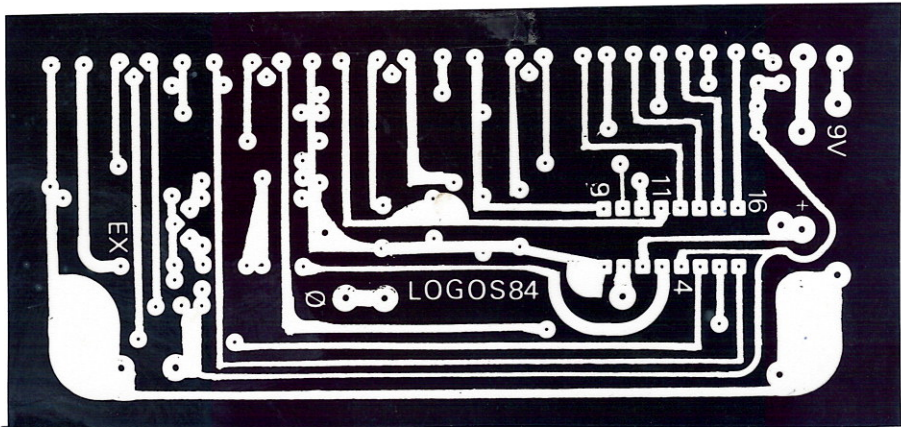
$0 = E_{ext} \cdot (pin 12)$

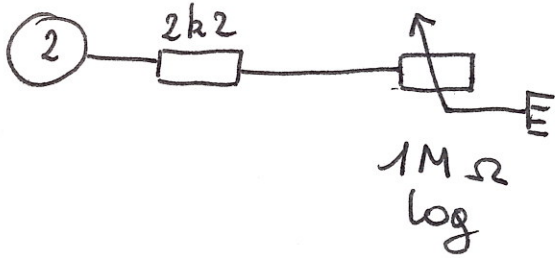
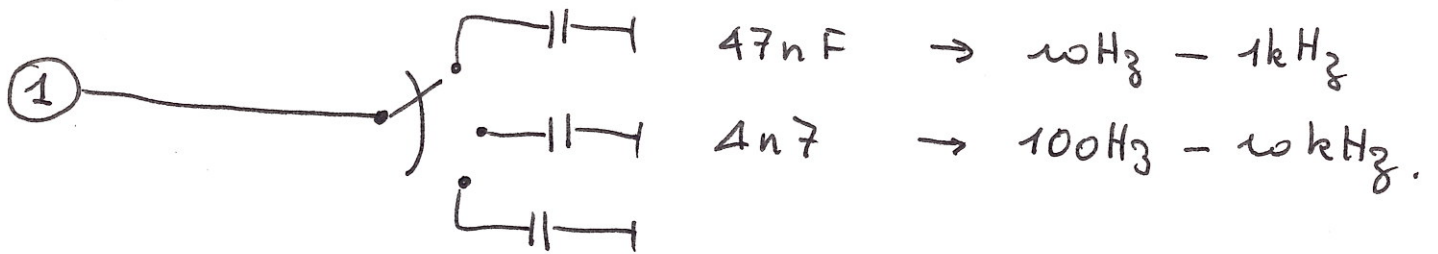
$1 = T_{in} \cdot (SLF)$

LFO	VCO	VCO
	LFO	
1	0	0
0	1	0
0	1	0

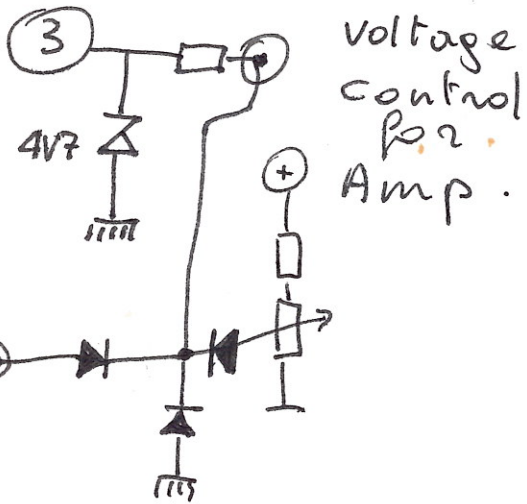


helog VI  
 i-module





Filter.



$$0,4V < U_i < 3,5V$$

$$\text{voor } 20\text{Hz} < f < 1\text{kHz}$$

$$\rightarrow 0 < R < 470\text{k}\Omega$$

$$\rightarrow C = 47\text{nF}$$

$$200\text{Hz} < f < 10\text{kHz}$$

$$C = 4,7\text{n}$$

Potmeter : 470k  $\Omega$  log.

$$I_{\text{limit}} : 250\mu\text{A}$$

$$U = I \cdot R$$

$$\rightarrow R_{\text{min}} = \frac{2,75}{250 \cdot 10^{-6}} = 0,02 \cdot 10^6 = 20\text{k}\Omega$$

$$= \frac{2,75}{250 \cdot 10^{-6}} = 0,011 \cdot 10^6 = \underline{\underline{11\text{k}\Omega}}$$

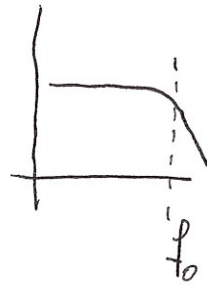
waarvan 9k  $\Omega$   
in teken

$\rightarrow$  serie waartend  
nodigstelijk ca 2k $\Omega$ .



Noise :

$$f_{\text{off}} = \frac{0,43}{(9\text{k}\Omega + R) C}$$



voor  $f_{20\text{Hz}}$  :

$$20 = \frac{0,43}{(479.000) C}$$

& stel ~~20 Hz~~

$$R_{\text{max}} = 470\text{k}\Omega$$

$$0,43 = 20 \times 479.000 C$$

$$C = \frac{0,43}{9,6 \cdot 10^6}$$

$$= \frac{0,43}{9,6} 10^{-6}$$

$$= 0,04 \cdot 10^{-6}$$

$$\approx 47\text{nF}$$

$\Rightarrow f$  bij  $R_{\text{min}} = 0\Omega$

$$f_{\infty} = \frac{0,43}{9000 \cdot 47 \cdot 10^{-9}} = \frac{0,43}{9 \cdot 47 \cdot 10^{-6}}$$

$$= \frac{0,43}{423} 10^6 = 0,001 \cdot 10^6 = \underline{\underline{1.000\text{ Hz}}}$$

## Berekeningsresultaten.

Noise filter :  $839 \text{ Hz} < f_0 < 10 \text{ kHz}$ .

bij  $C = 1 \text{ nF}$   
& potm =  $470 \text{ k}$   
& serie R =  $33 \text{ k}$

SLF :  $1361 \text{ Hz} < f_0 < 5 \text{ kHz}$

bij  $C = 10 \text{ nF}$   
& potm. =  $470 \text{ k}$   
& serie R =  $3 \text{ k}$

bij potmeter  $220 \text{ k}$  :  $f_{\text{min}} = 283 \text{ Hz}$ .

$100 \text{ k} \rightarrow f_{\text{min}} = 584 \text{ Hz}$ .

VCO : (Eq. 3)

case 1

$708 \text{ Hz} < f_0 < 16 \text{ kHz}$

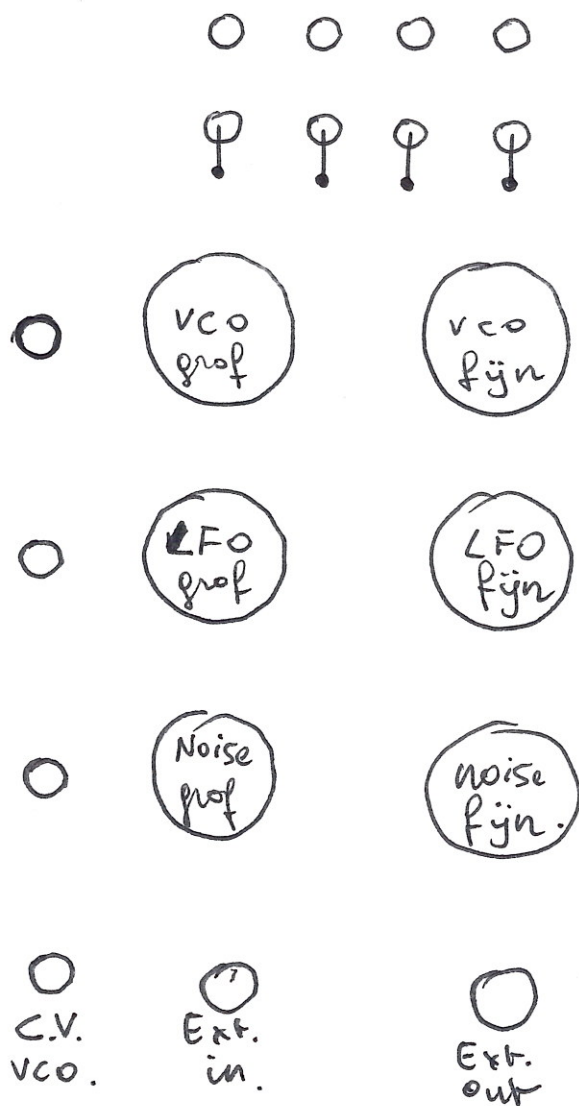
bij  $C = 4,7 \text{ nF}$   
& potm =  $470 \text{ k}$   
& serie R =  $5 \text{ k}$

bij potm.  $220 \text{ k}$   $f_{\text{min}} = 1464 \text{ Hz}$ .

$\Rightarrow$  Eq. 2  $f_{\text{max}} = 8,7 \text{ kHz}$  &  $f_{\text{min}} = 263 \text{ Hz}$   
met zwaai 10:1

front panel:

A. professionele uitvoering



SLF - berekening

$$f = \frac{0,66}{(g_k + R_{serie}) \cdot C}$$

stel  $R_{serie} = 3 \text{ k}\Omega$

$C = 10 \text{ nF}$

$$\rightarrow f_{max} = \frac{0,66}{12,9 \cdot 10^3 \cdot 10^{-8}} = \frac{0,66}{12,9} \cdot 10^5 = 5 \text{ kHz}$$

stel  $R_{pot} = 470 \text{ k}\Omega$

$$f_{min} = \frac{0,66}{483 \cdot 10^3 \cdot 10^{-8}} = \frac{0,66}{483} \cdot 10^5 = \underline{\underline{136 \text{ Hz}}}$$

bij pot =  $220 \text{ k}\Omega$

$$f_{min} = \frac{0,66}{233 \dots} = \frac{0,66}{233} \cdot 10^5 = \underline{\underline{283 \text{ Hz}}}$$

look

$$\frac{0,66}{113} \cdot 10^5 = \underline{\underline{584 \text{ Hz}}}$$

VCO - berek.

$$f_{\max} = \frac{1.45}{14,6 \cdot 10^3 \cdot 4,7 \cdot 10^{-9} \cdot 0,9}$$

$$R_{\text{seri}} = \underline{5k6}$$

$$= \frac{1,45}{61,7} \cdot 10^6 = 16 \text{ kHz}$$

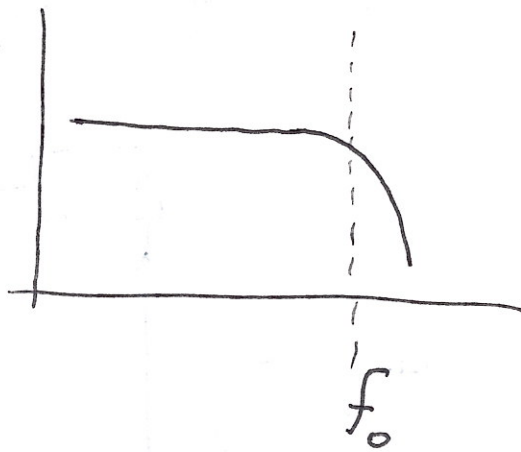
→ pdm. 170k →

$$\frac{1,45}{484 \cdot 4,7 \cdot 0,9} = \underline{708 \text{ Hz}}$$

$$\underline{220k} \quad \frac{1,45}{234 \cdot 4,7 \cdot 0,9} = 1,464 \text{ kHz}$$

$$\frac{0,6}{14,6 \cdot 4,7}$$

$$\frac{0,6}{485 \cdot 4,7}$$



$$f_0 = \frac{0,43}{(9k\Omega + R) C}$$

$$= \frac{0,4}{(500k) \cdot 10^{-9}}$$

$$= \frac{0,4}{5 \cdot 10^5 \cdot 10^{-9}}$$

$$= \frac{0,4}{5 \cdot 10^{-4}}$$

$$= \frac{4 \cdot 10^3}{5} = 0,8 \cdot 10^3 = 800 \text{ Hz}$$

stiel  $500k = R_{\text{max}}$

$1nF = C_{\text{min}}$

stiel pot m. =  $1k\Omega$  (minimum)

$$\frac{0,4}{10^4 \cdot 10^{-9}}$$

$$\frac{0,4}{10^{-5}} = 0,4 \cdot 10^5 = 40.000 \text{ Hz}$$

$$f_0 \sim \frac{1}{R}$$

$$\text{Stel } R_{\text{serie}} = 1k\Omega$$

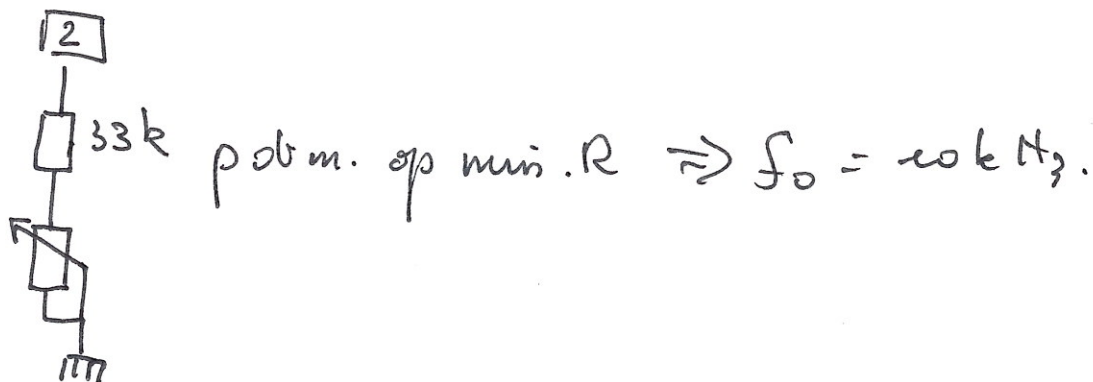
$$\begin{aligned} \rightarrow f_0 &= \frac{0,43}{20k \cdot C} && \text{stel } C = 1nF \\ &= \frac{0,43}{10^4 \cdot 10^{-9}} = 0,43 \cdot 10^5 = 43kHz. \end{aligned}$$

$$\text{Stel } R_{\text{serie}} = 12k\Omega$$

$$\rightarrow f_0 = \frac{0,43}{19 \cdot 10^3 \cdot 10^{-9}} = \frac{0,43}{19} \cdot 10^6 = 22,6kHz$$

$$\text{Stel } R_{\text{serie}} = 33k\Omega$$

$$f_0 = \frac{0,43}{42 \cdot 10^3 \cdot 10^{-9}} = \frac{0,43}{42} \cdot 10^6 = \underline{\underline{10kHz}}$$



stiel pobm = 200k

$$f_0 = \frac{0,43}{142 \cdot 10^3 \cdot 10^{-9}} = \frac{0,43}{142} \cdot 10^6 = 3 \text{ kHz}$$

stiel pobm = 220k

$$f_0 = \frac{0,43}{262 \cdot 10^3 \cdot 10^{-6}} = \frac{0,43}{262} \cdot 10^6 = 1,6 \text{ kHz}$$

stiel pobm = 470k

$$f_0 = \frac{0,43}{512 \cdot 10^3 \cdot 10^{-6}} = \frac{0,43}{512} \cdot 10^6 = 839 \text{ Hz}$$



$$\text{als } \frac{f_{\min}}{f_{\max}} = \frac{1}{\omega} \quad \text{olen}$$

bij pot-meter ook moet  $R_{\text{serie}} = ?$

---

$$f_{\max} = 20.000 \text{ Hz} = \frac{0,43}{R \cdot 10^{-9}}$$

$$0,43 = 2 \cdot 10^4 \cdot 10^{-9} \cdot R$$

$$= 2 \cdot 10^{-5} R$$

$$R = \frac{0,43}{2 \cdot 10^{-5}} = 0,22 \cdot 10^5$$

$$= 22000$$

$$= 22 \text{ k}\Omega$$

$$\Rightarrow \text{Potm. } \underline{13 \text{ k}} + 1 \text{ nF} \Rightarrow f_{\max} 20.000 \text{ Hz}$$

$$f_{\min} = 2 \cdot 10^3$$

