

15V AC! adapter

max ± 20V

+2,5 → +15

LM317

+2,5

5

8

10

12

+15

-15

-12

-10

-8

-5

-2,5

10 µF

max ± -20V

LM337

120 Ω

120 Ω

240 Ω

288 Ω

192 Ω

192 Ω

288 Ω

192 Ω

288 Ω

288 Ω

192 Ω

192 Ω

288 Ω

240 Ω

120 Ω

120 Ω

120 Ω

120 Ω

120 Ω

120 Ω

120 Ω

1,25V → 10,4166 mA

ON/OFF  
+/- Ub

22 → 47µF  
(+10µTA?)

events  
Serial-R

22-47µF  
+10µTA

Power D's  
1N4002 → 1N4004

-2,5 → -15

100 nF

470 µF

100 nF

10 µF

100 nF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

10 µF

Gr.

draai schak.  
b stand.  
i dek  
switch

max  
5mA

4k7

47k

10 µF

15k

BC517

darlington

0,5 → 1µF

BC516

4k7

2e dek  
draaisch.

47k

10 µF

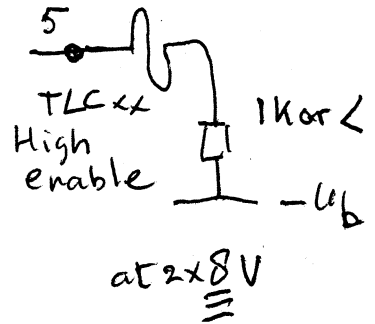
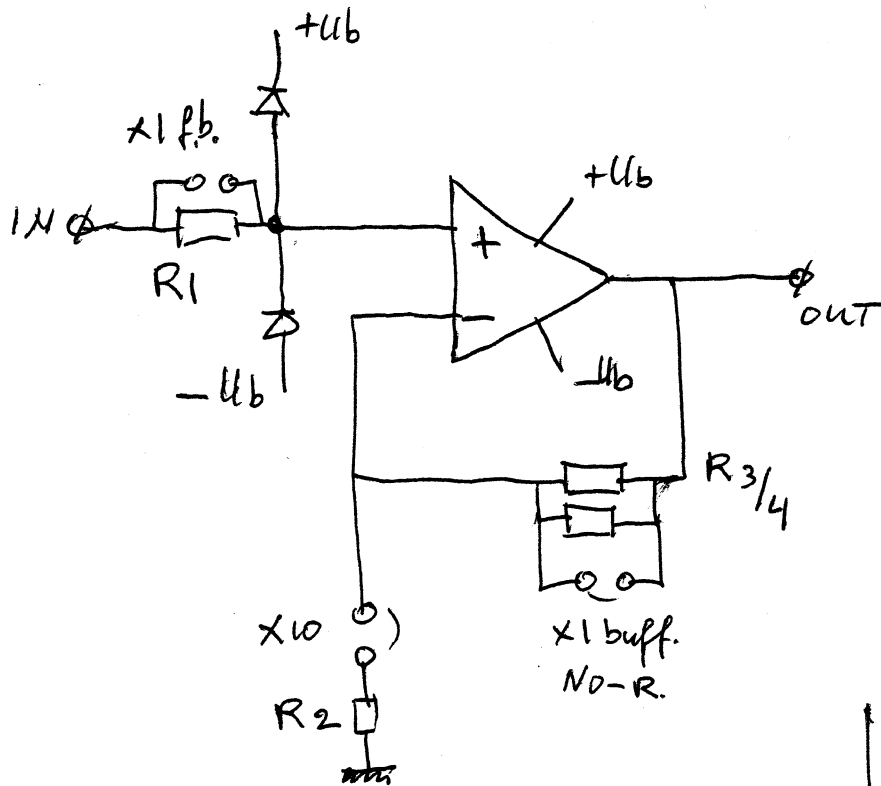
Gr.

100 nF

470 µF

100 nF

120 Ω  
(1,25V)

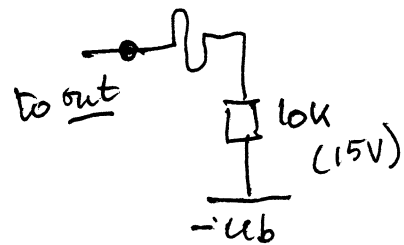
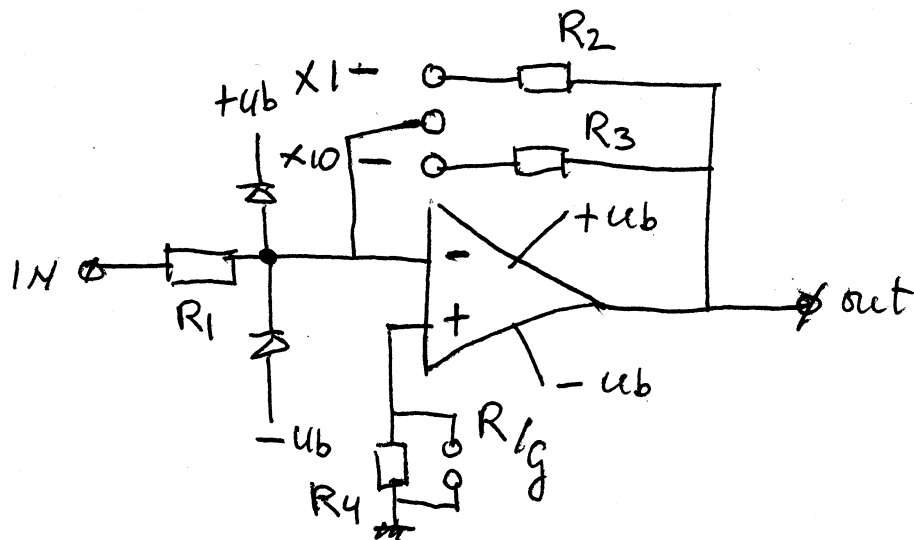


High- $R$   
 $R_1, R_2 = 10K$   
 $R_3, R_4 = 180K // = 90K$

Low- $R$   
 $R_1, R_2 = 1K$   
 $R_3, R_4 = 18K // = 9K$

x1+, x10+

Standard amp PLLs  
 for duo & quad op amp



for a more class-A

f.i LM 324

anti-cross test.

High- $\Omega \rightarrow R_1, R_2 = 10k$   
 $R_3 = 100k.$

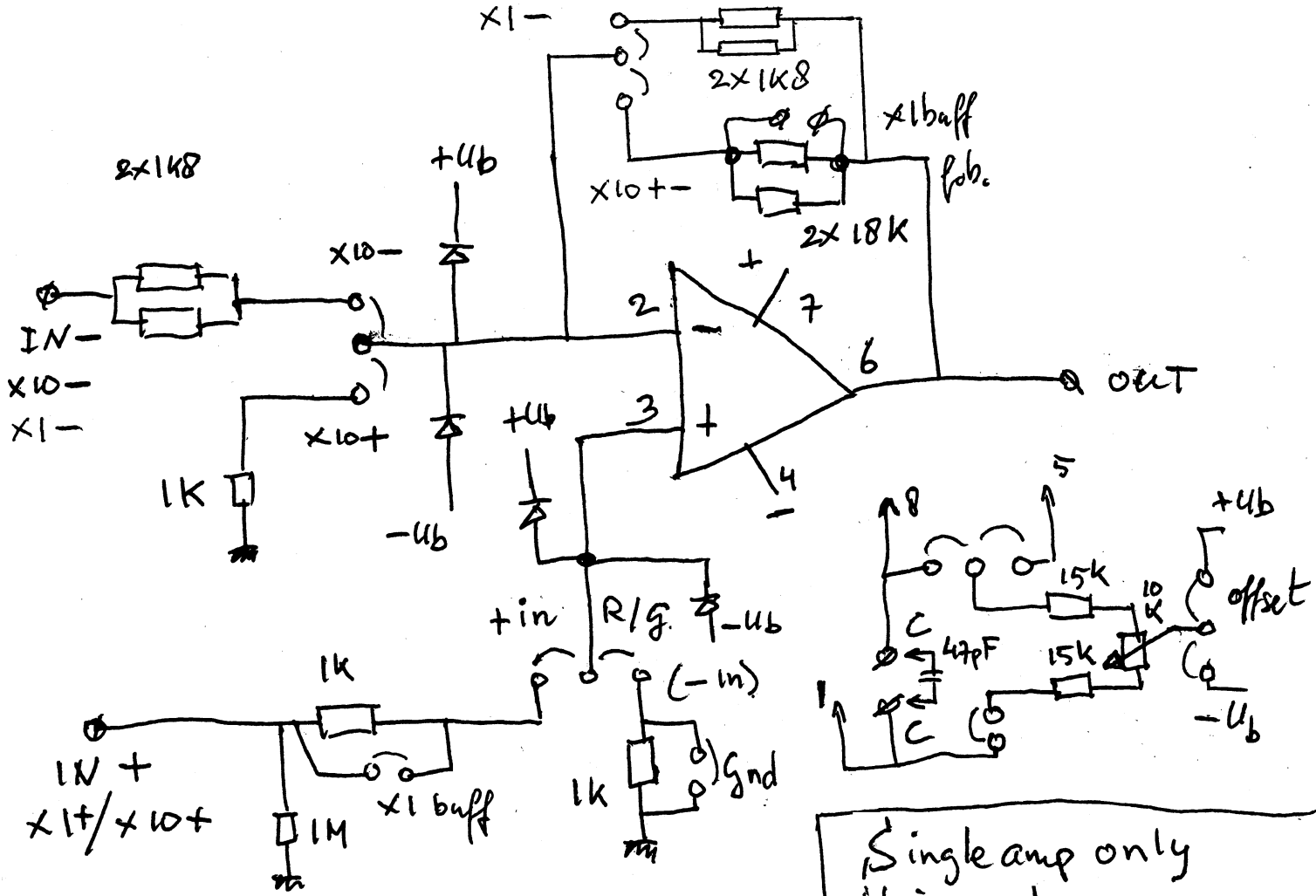
$R_4 = 4k7$

Low- $\Omega$

$R_1, R_2 = 1k$   
 $R_3 = 10k$   
 $R_4 = 470\Omega$

$X1 - , X10 -$

Standard amp MIN  
 for duo & quad opamp



Single amp only  
 Universal  
 test circuit low- $\beta$ .