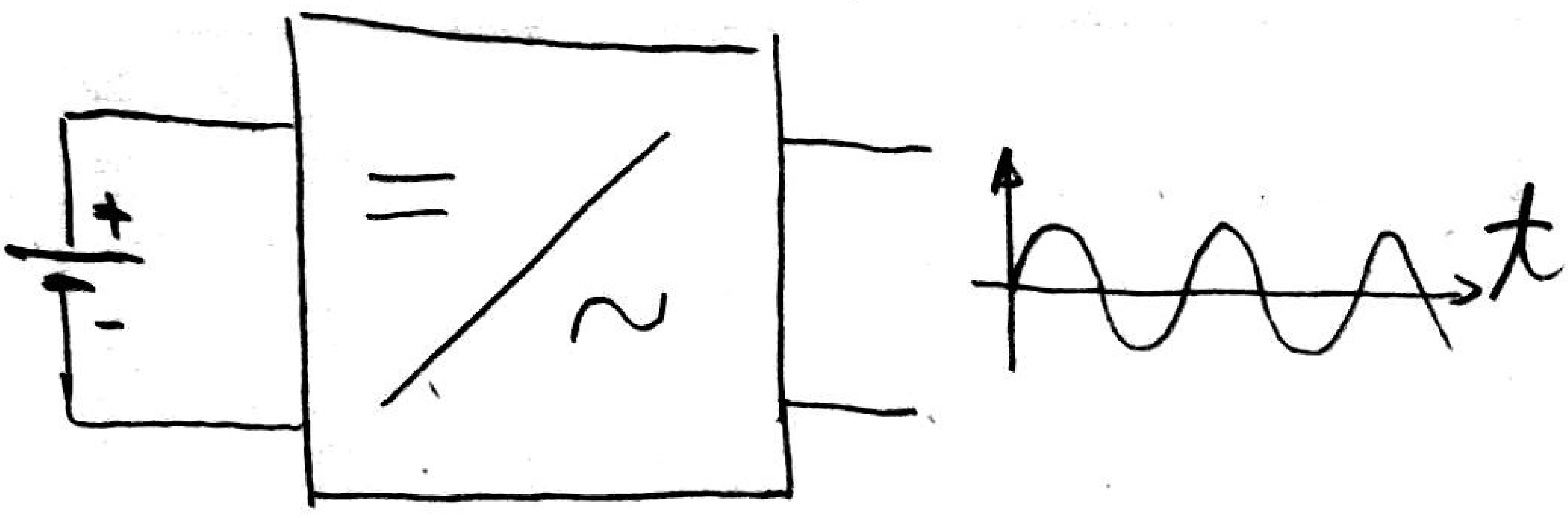
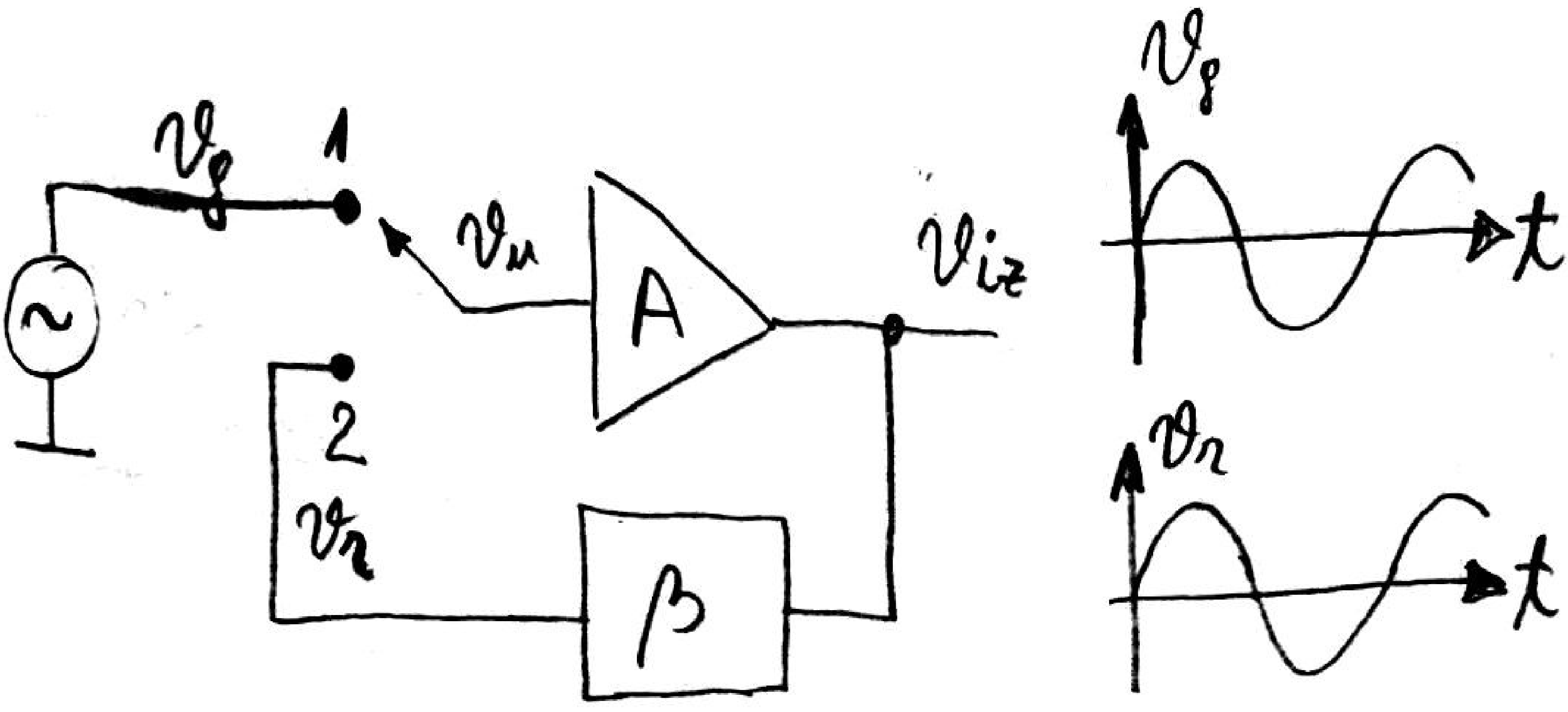
OSCILATORI

Oscilator pretvara jednosmjernu energiju u naizmjenicnu



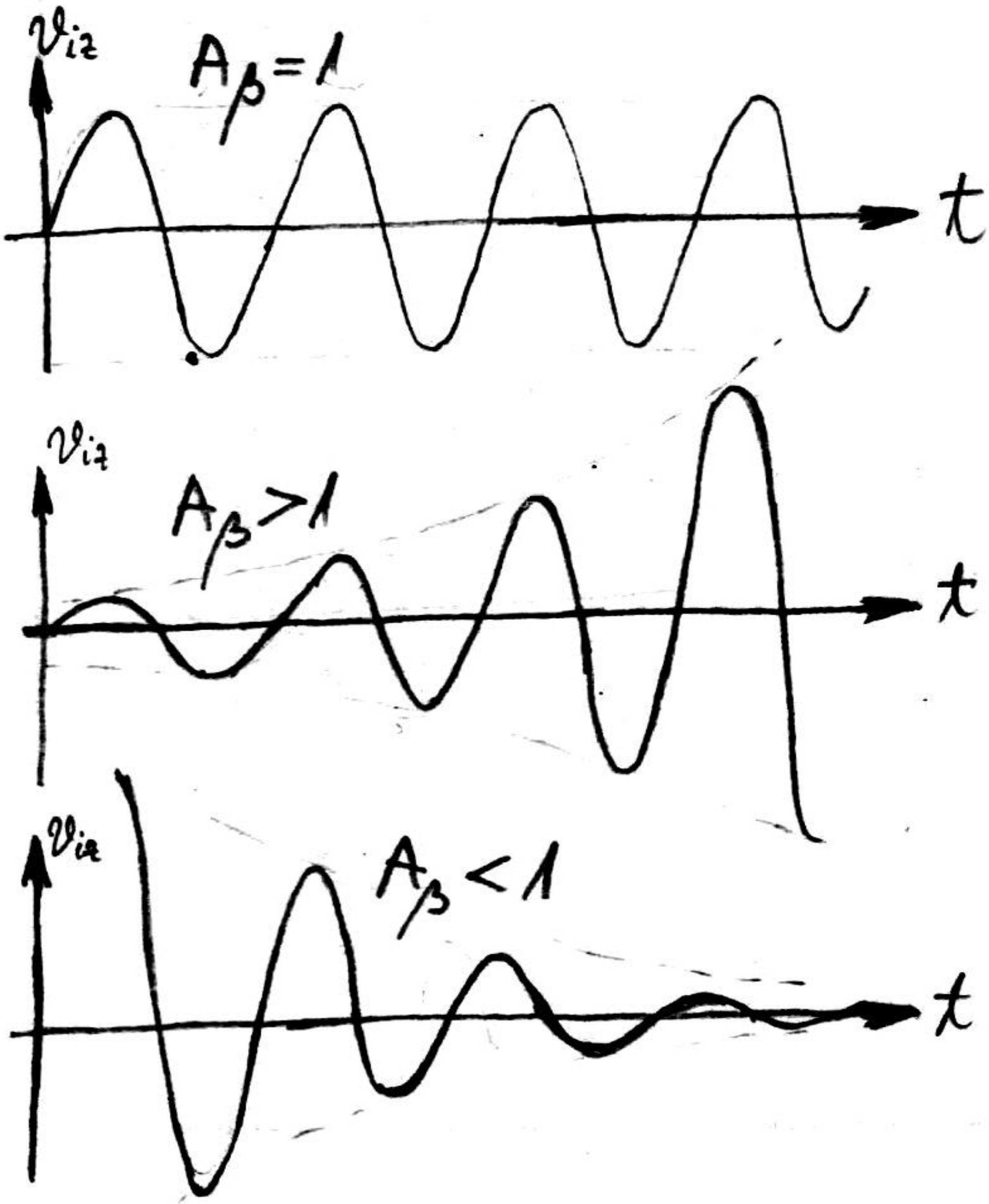
Od pojacavaca do oscilatora



Uslov oscilovanja

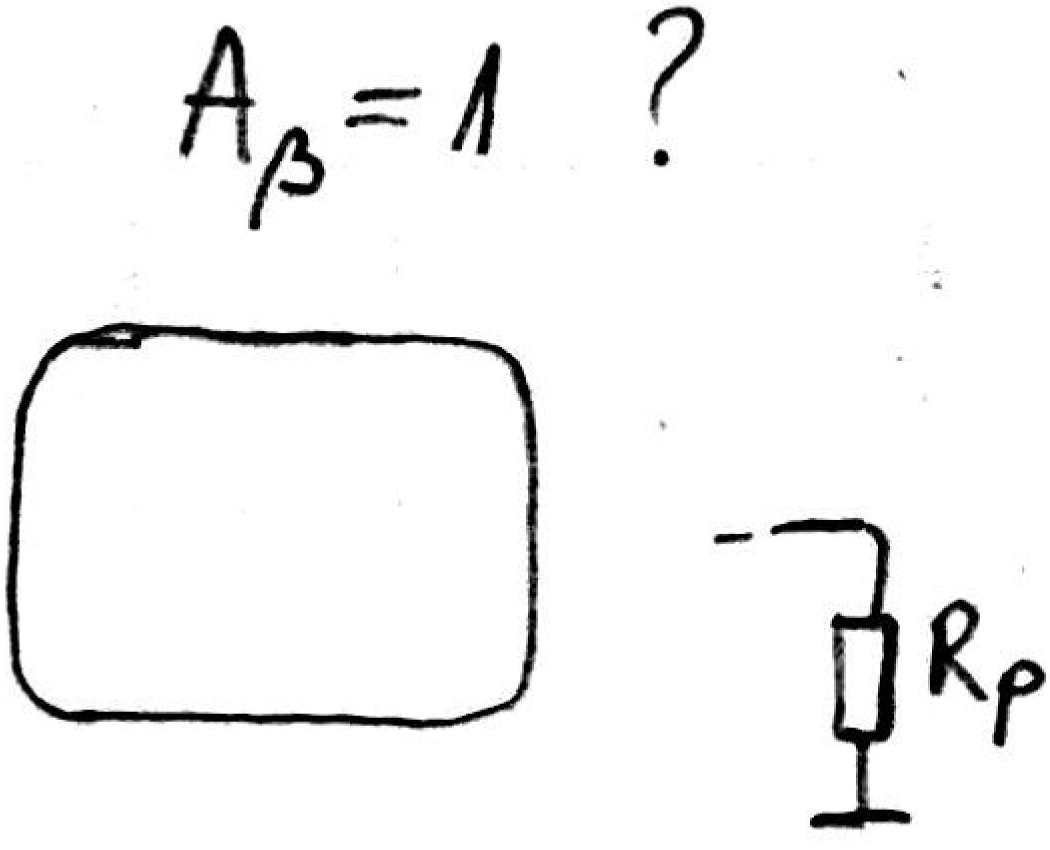
$$A\beta = 1 \Rightarrow \begin{cases} Re\{A\beta\} = 1 \\ Jm\{A\beta\} = 0 \end{cases}$$

$$A\beta = 1 \Rightarrow \begin{cases} |A\beta| = 1 \\ Arg\{A\beta\} = \phi = 0 \end{cases}$$

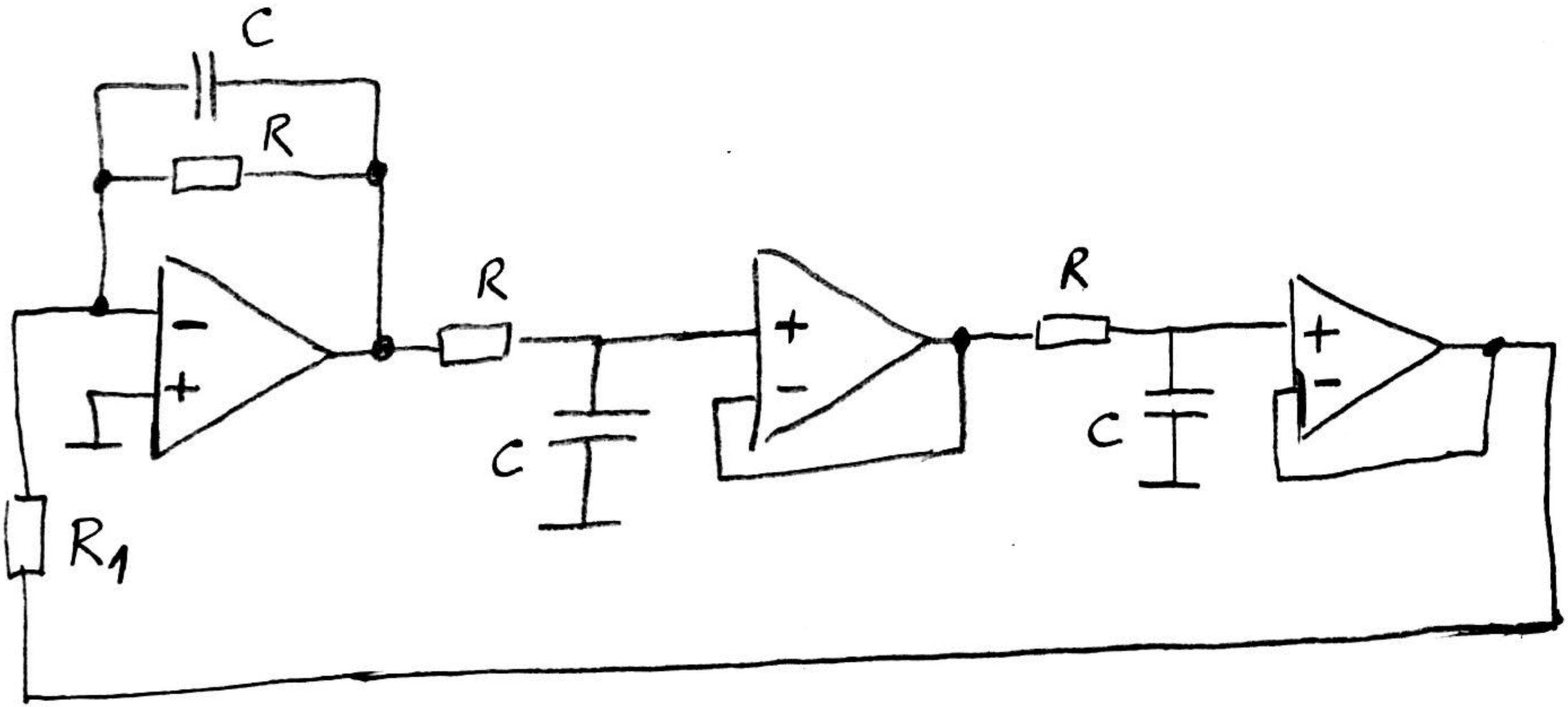


Od Ab zavisi da li ce oscilacije biti: stalne rastuce ili opadajuce

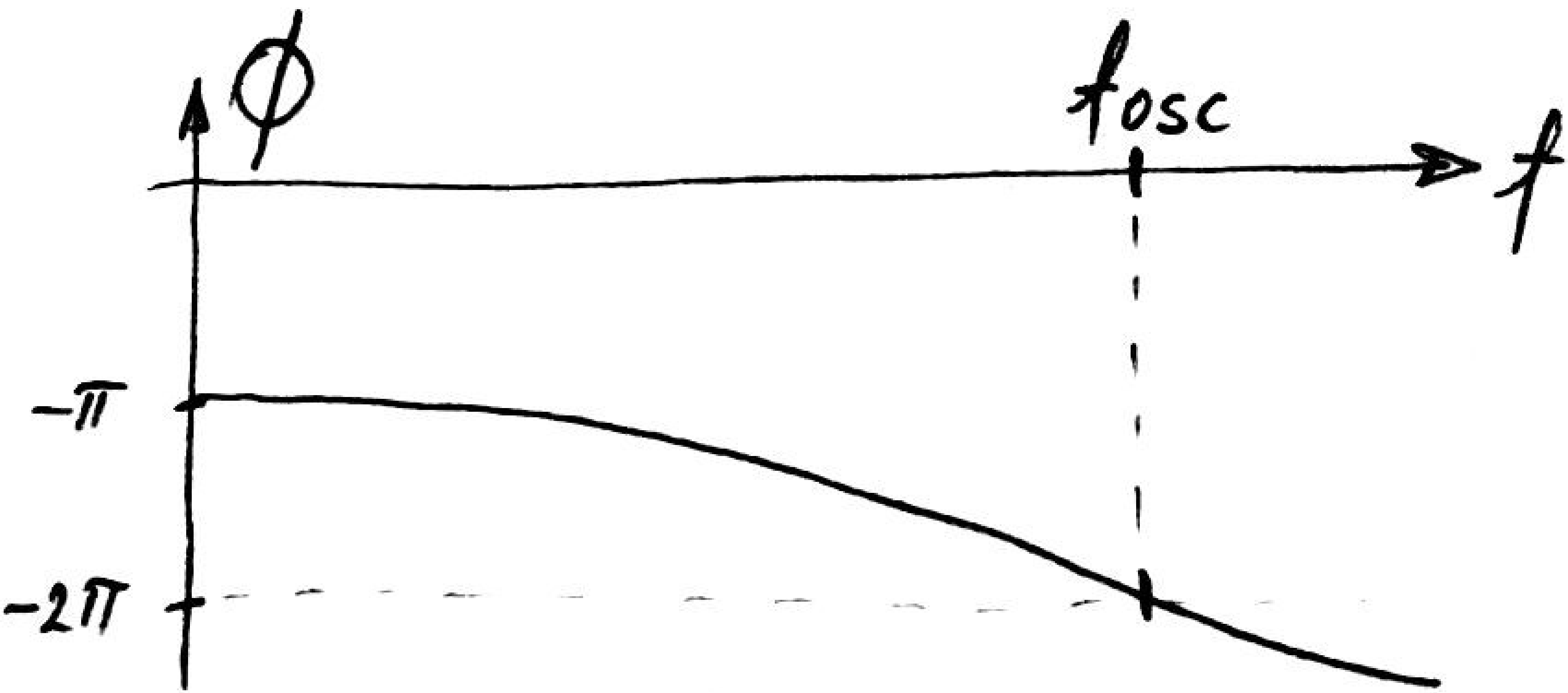
Da li ovo kolo ima Ab=1?
Sta se desava kada se spoji i Rp?



Naci fosc i potreban odnos R/R1.

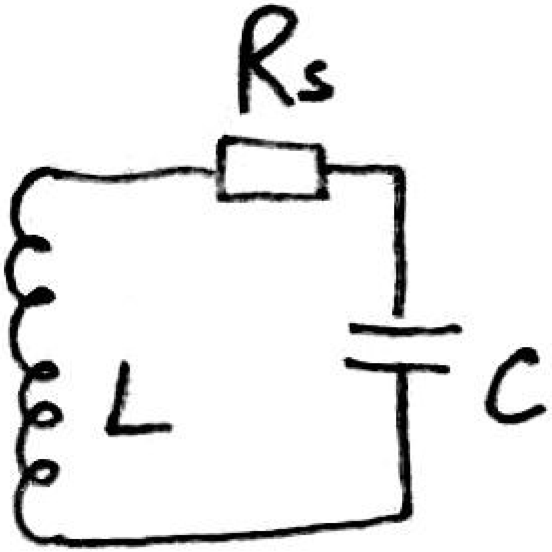


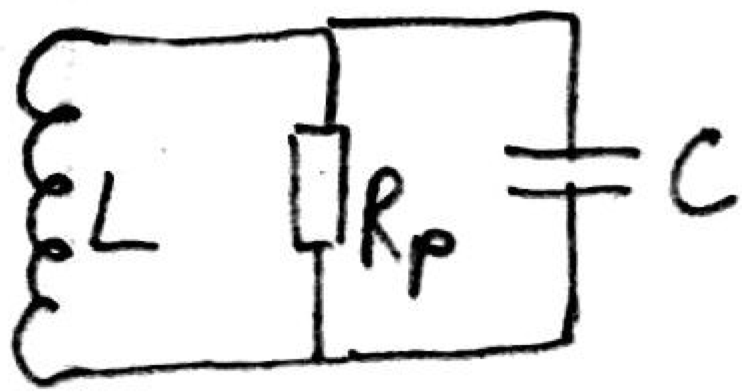
Ucestanost oscilovanja fosc ce biti u tacki gdje je fazni pomak jednak 2*N*pi



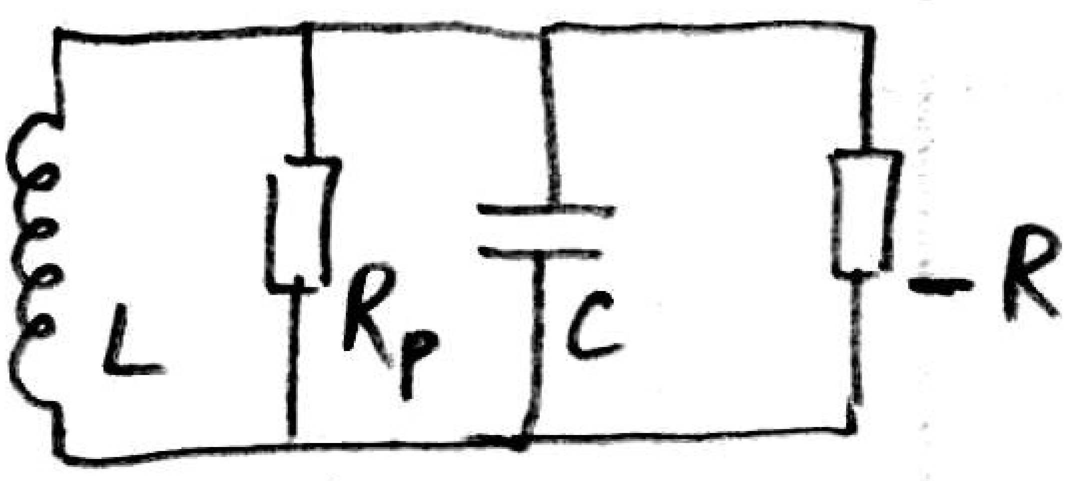

HARMONIC MIXER

Oscilatorno kolo ima prigusene oscilacije zbog gubitaka u Rs ili Rp

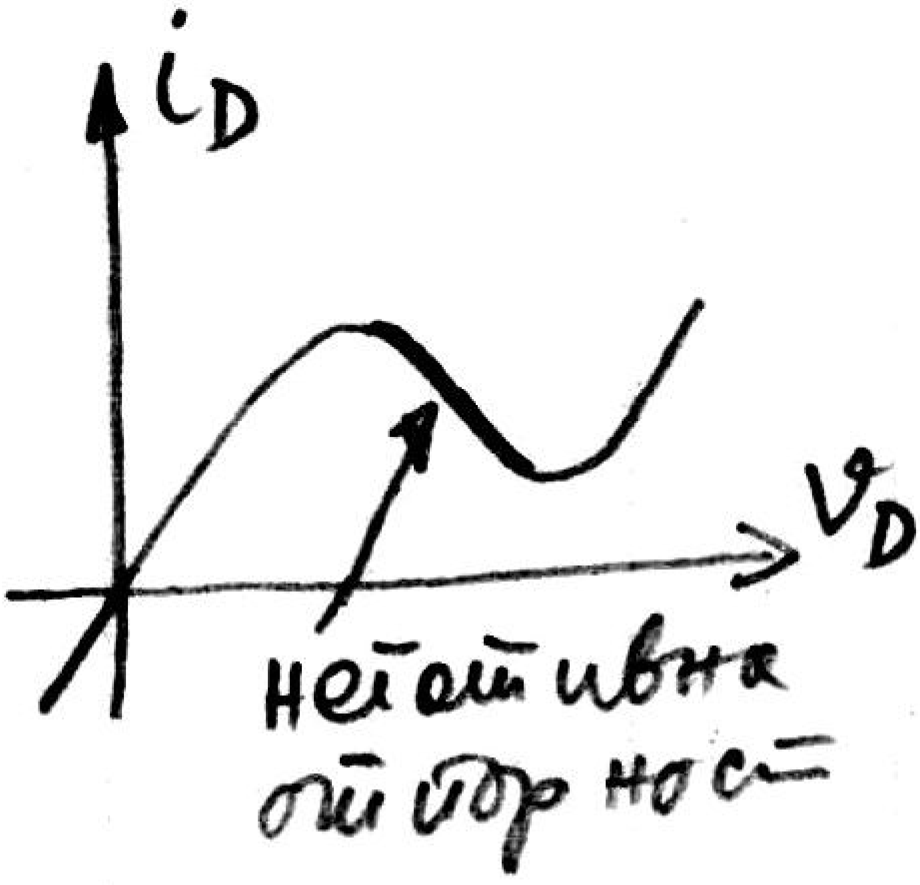


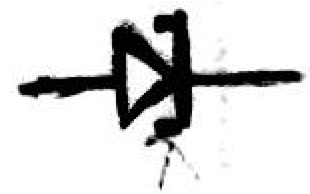


Negativna otpornost je izvor energije koji moze da nadoknadi gubitke na Rp i omoguci stalne oscilacije u kolu

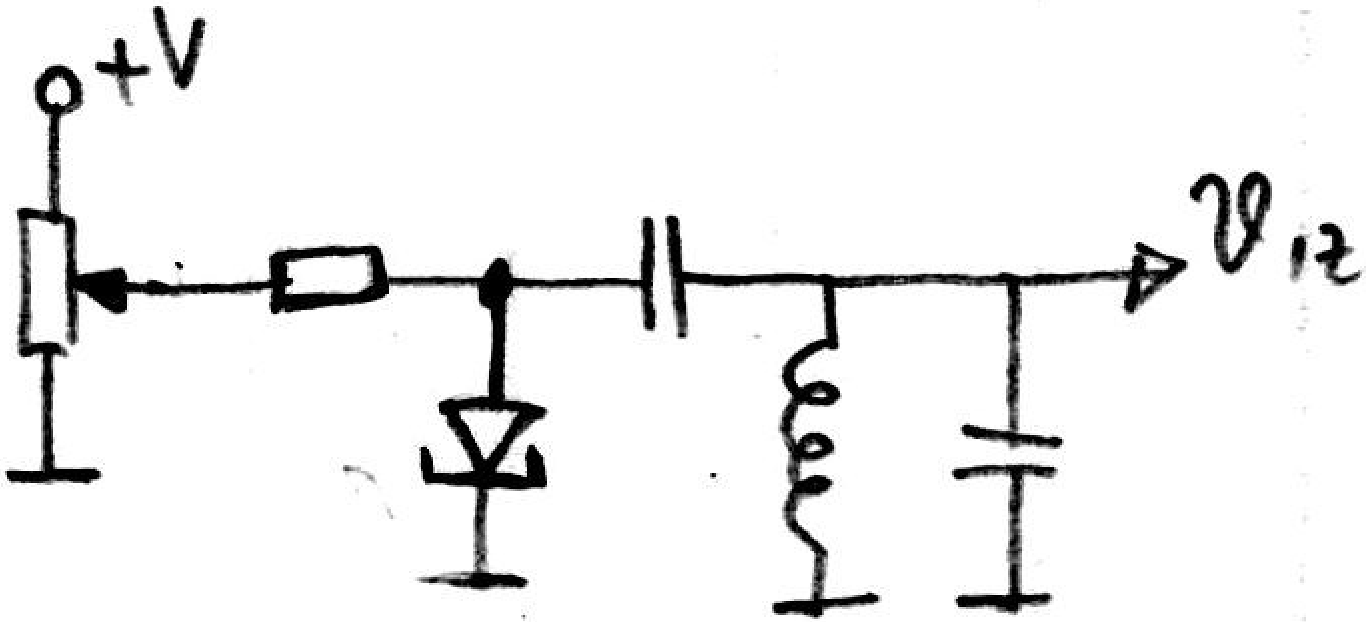


Tunel-dioda ima negativnu otpornost





Oscilator sa tunelskom diodom



Sema oscilatora sa tunelnom diodom

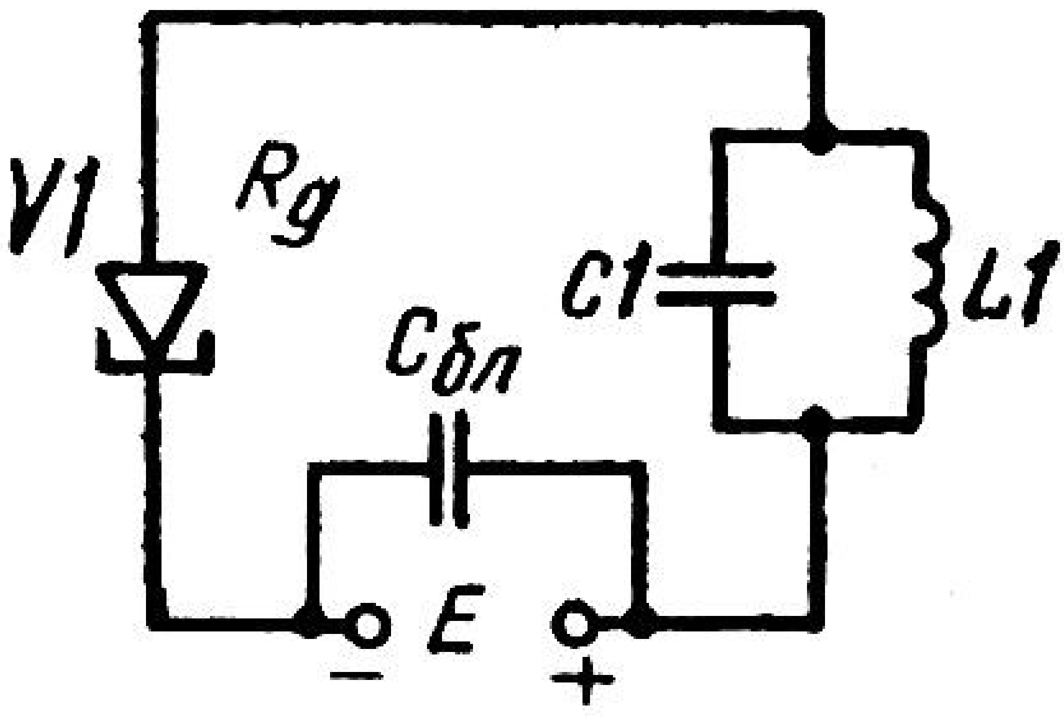


Рис. 11.43. Схема генератора на туннельном диоде.

Pojacavac sa tunelnom diodom

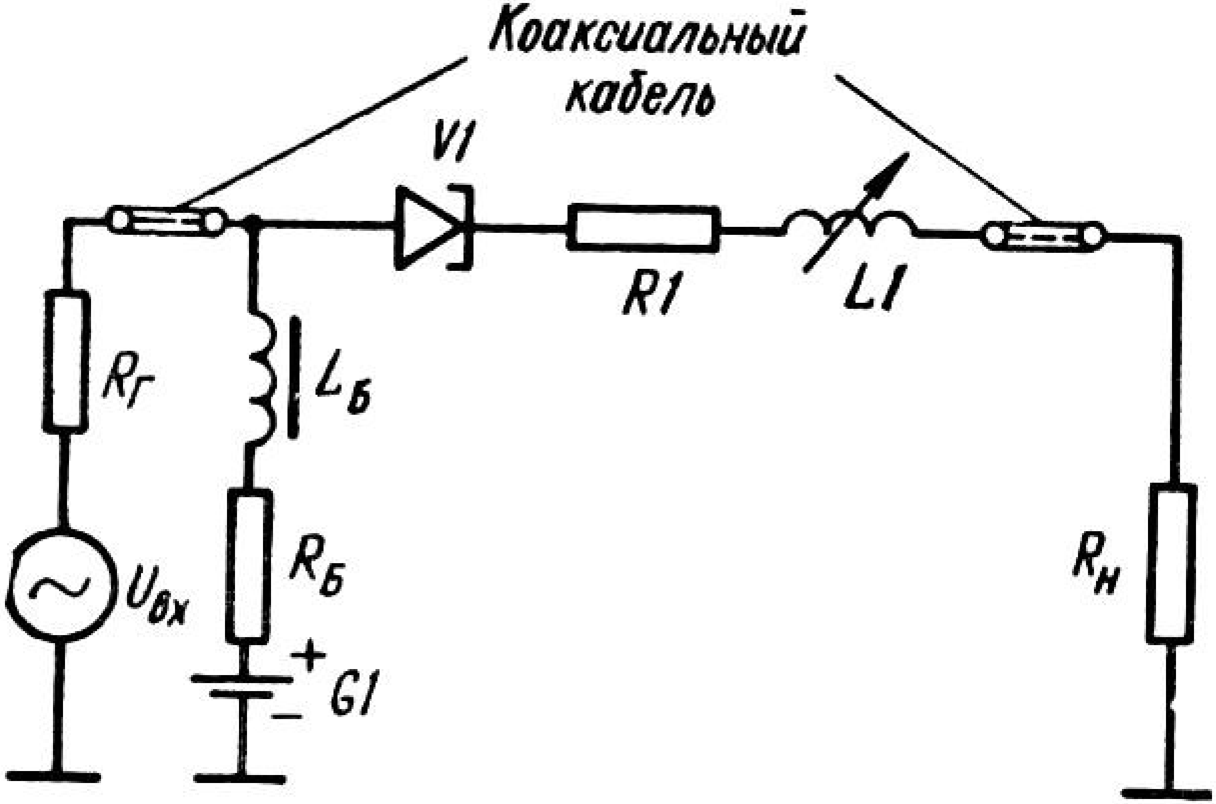
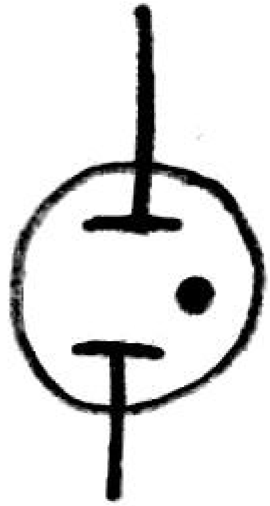


Рис. 11.42. Принципиальная схема усилителя на туннельном диоде.

Tinjalica, takodje, ima negativnu otpornost, pa se i sa njom moze napraviti oscilator



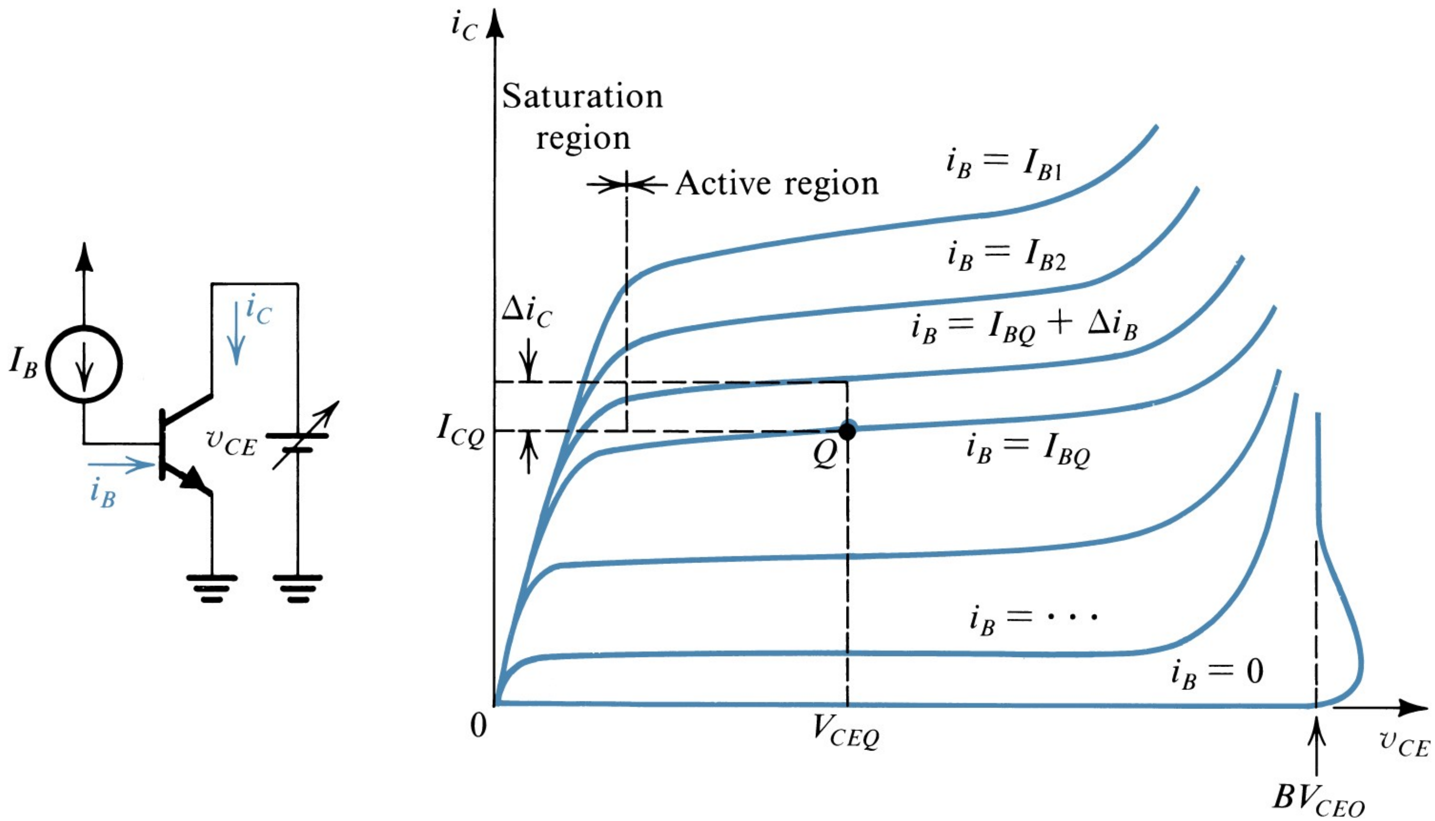
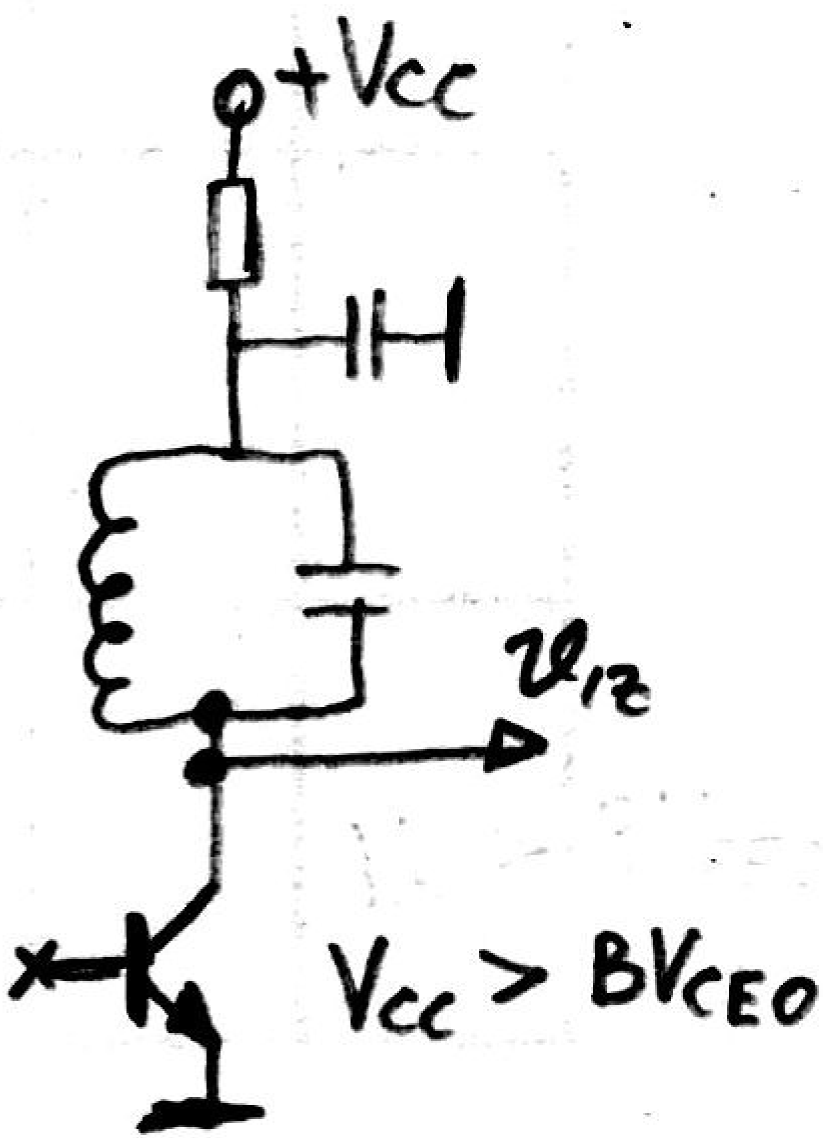
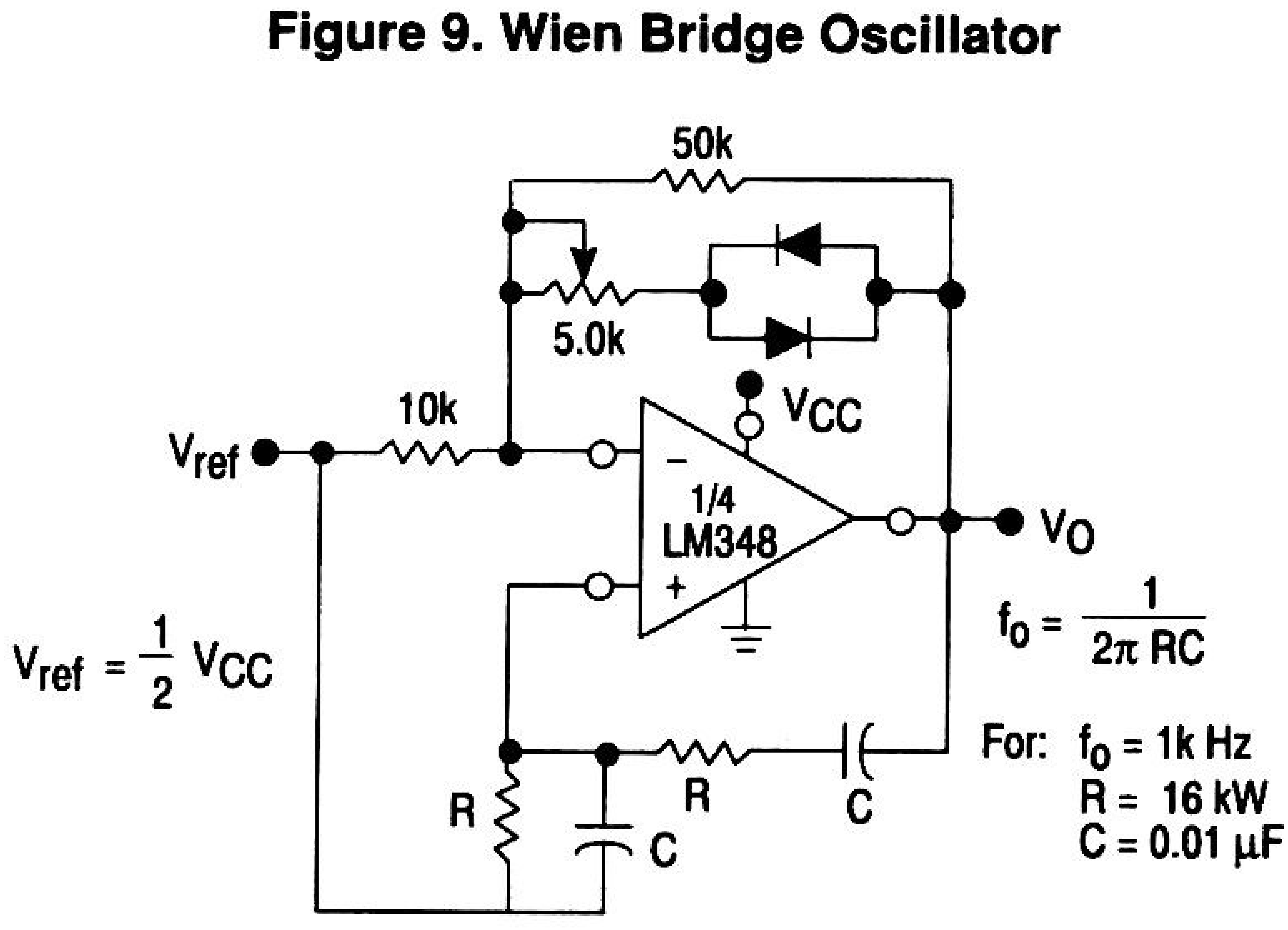


Fig. 4.65 Common-emitter characteristics. Note that the horizontal scale is expanded around the origin to show the saturation region in some detail.



Oscilator se moze napraviti i koriscenjem negativne otpornosti koju BJT ima u rezimu proboja sa otvorenom bazom

Oscilator sa Vinovim mostom



Oscilatori 2 (regulacija amplitude oscilovanja)

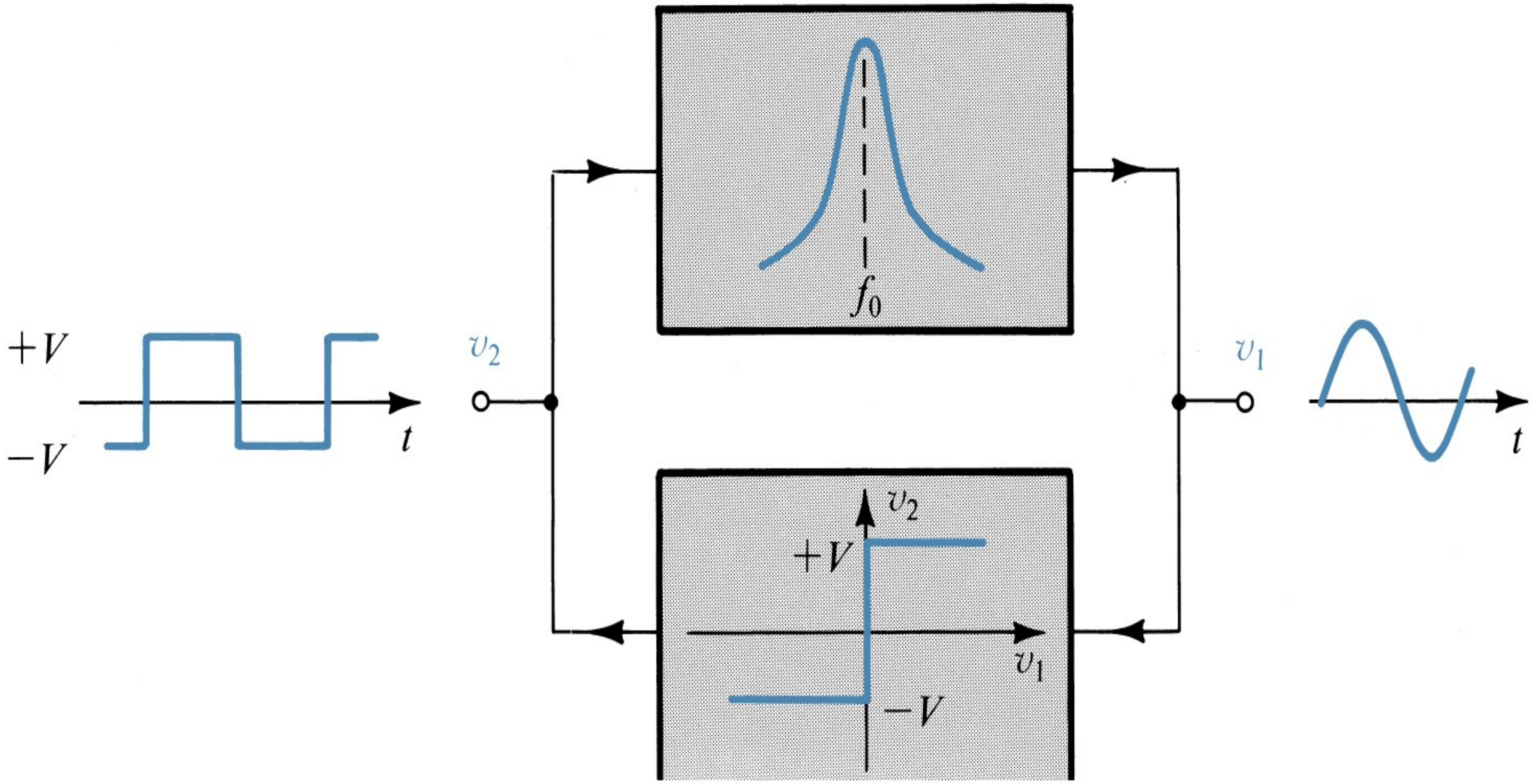


Fig. 12.10 Block diagram of the active-filter tuned oscillator.

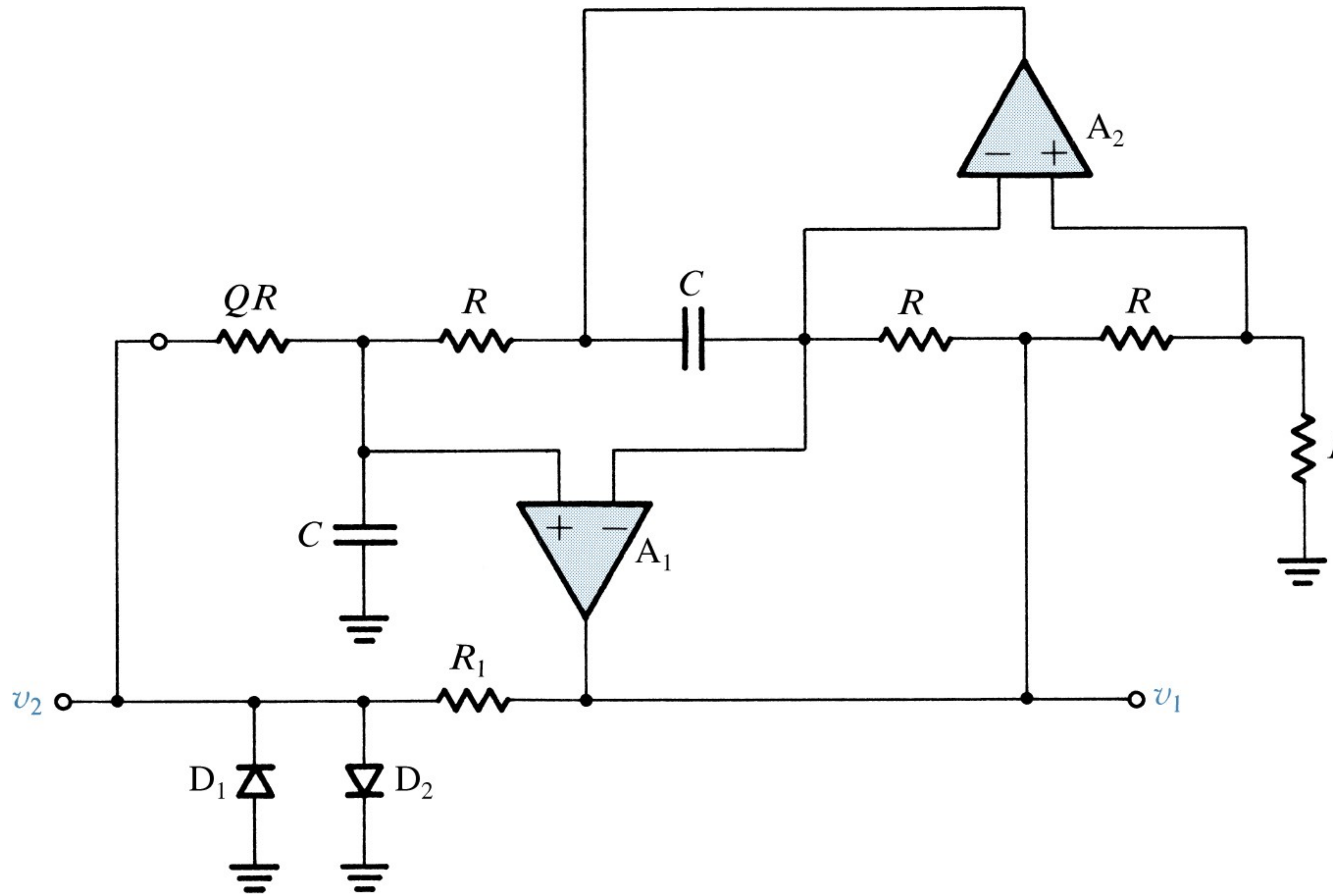
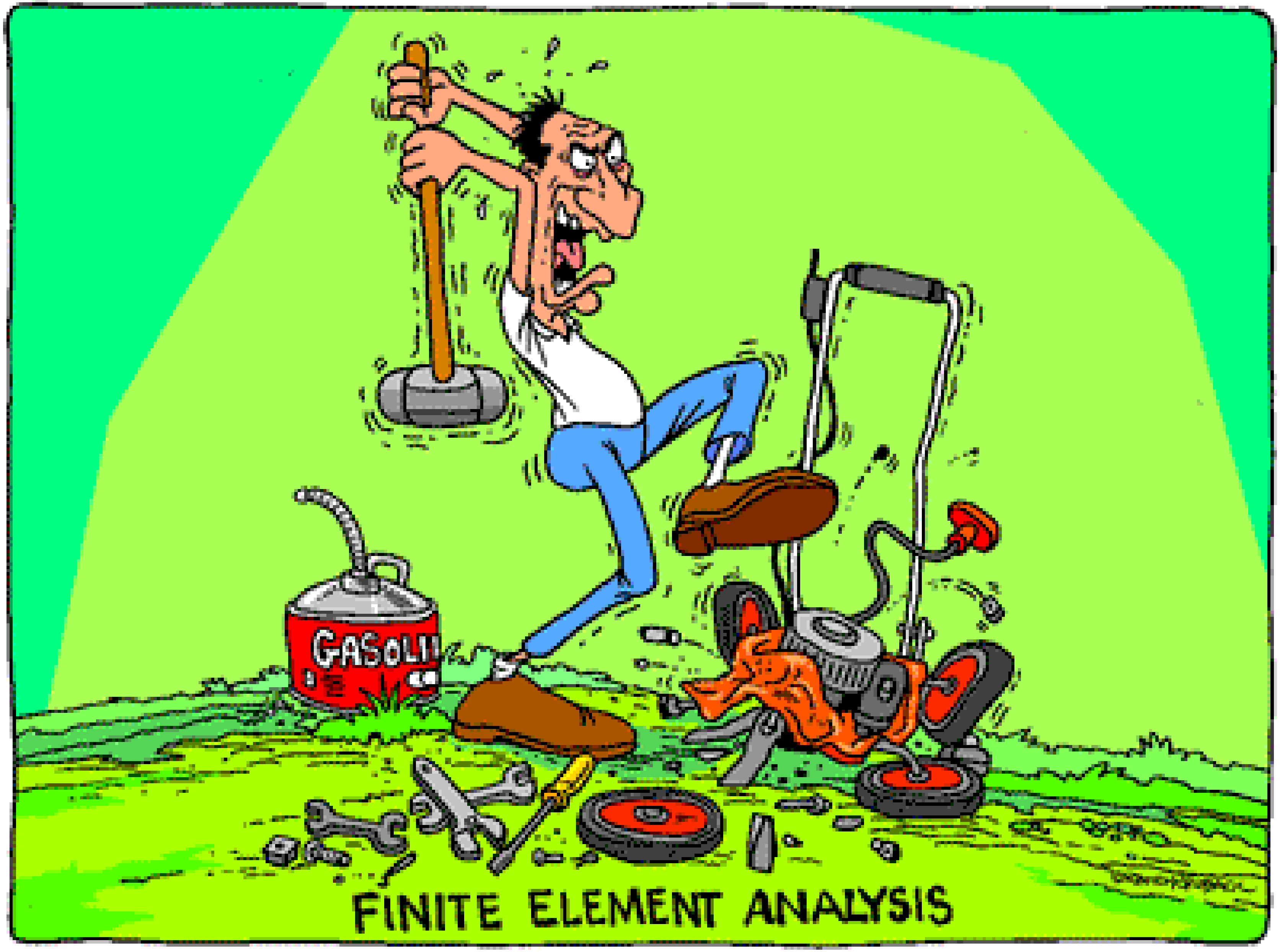
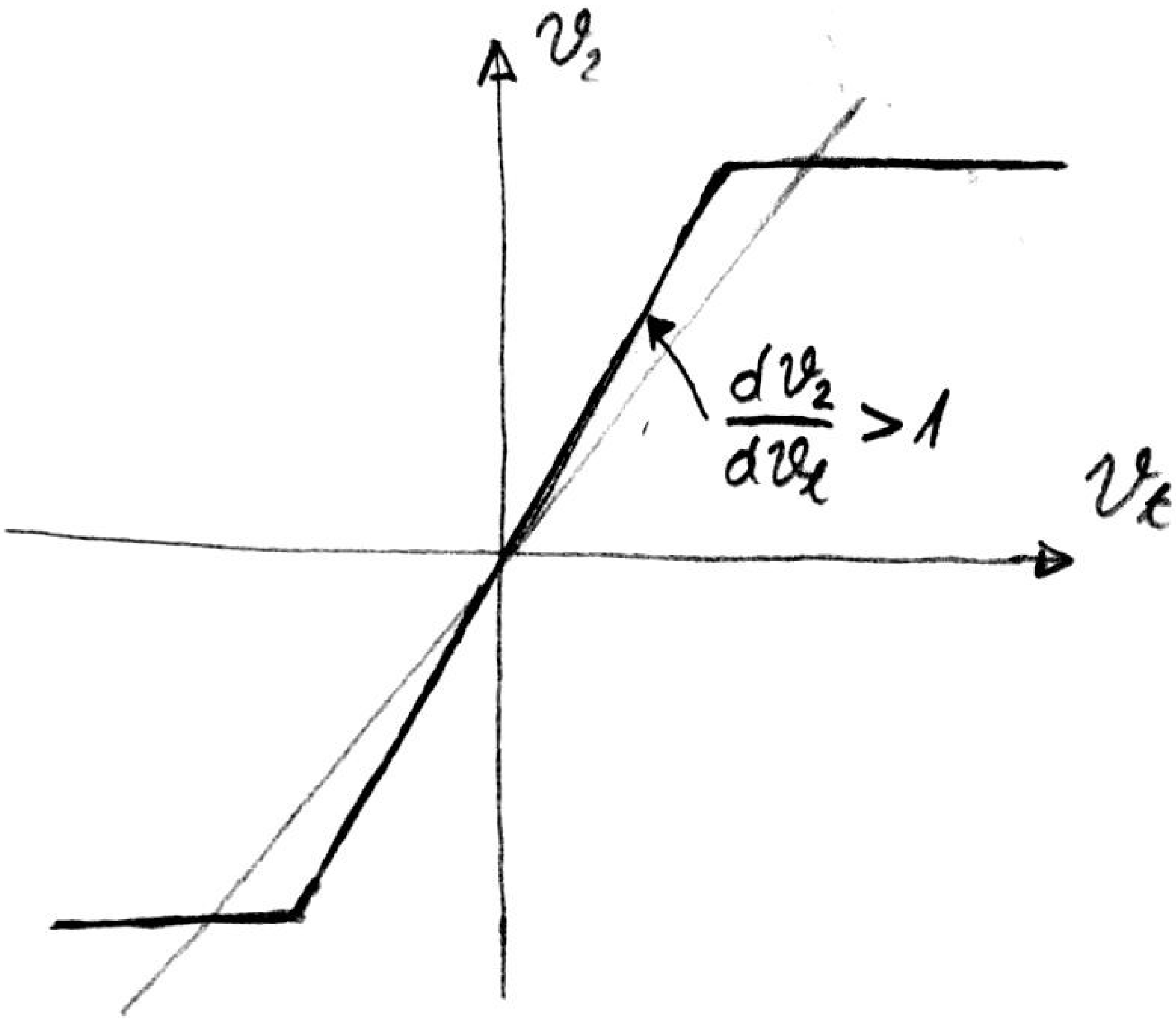


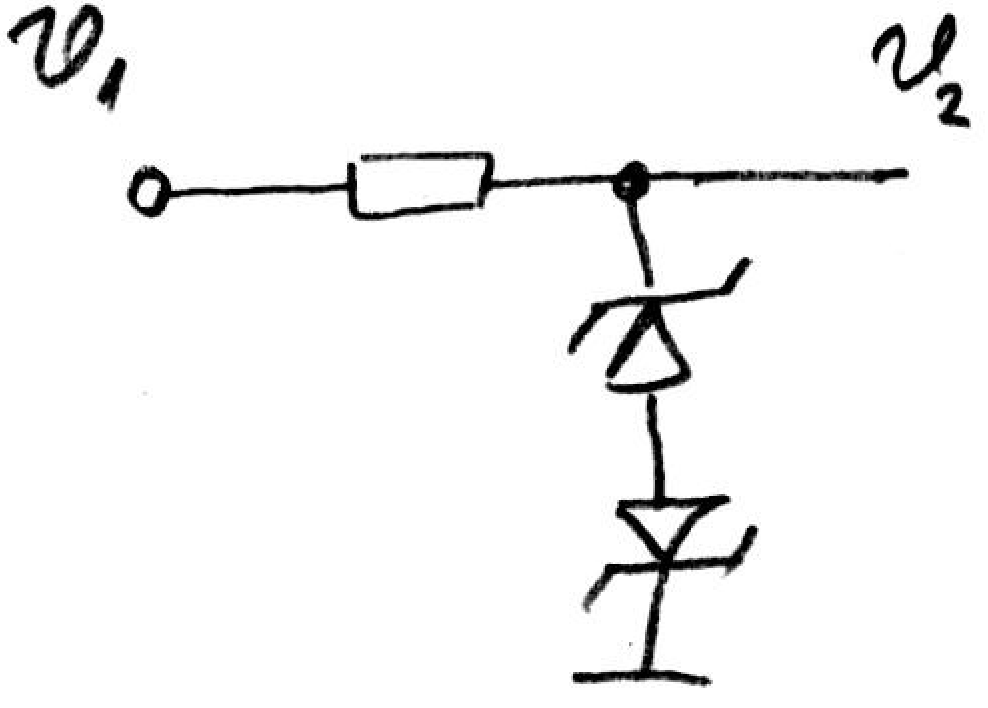
Fig. 12.11 Practical implementation of the active-filter tuned oscillator.


GASOLI
FINITE ELEMENT ANALYSIS

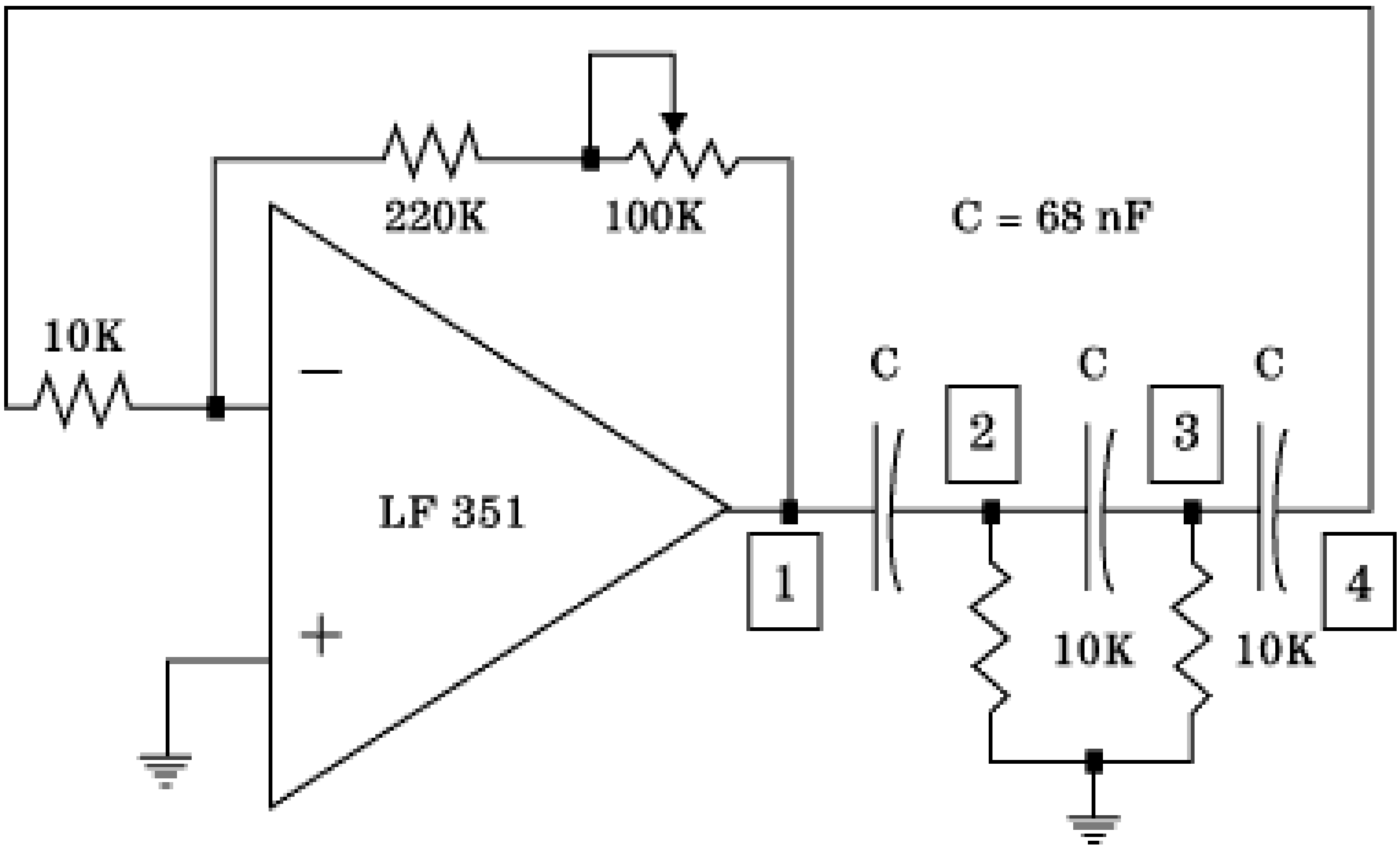
Svaki pojacavac ima nelinearnost tipa zasicenja



Nelinearnost se moze dodati u oscilator i pomocu kola sa 2 Cenerove diode



RC oscilator - amplituda je odredjena granicama zasicenja OP



Naponi u cvorovima 1, 2, 3 i 4

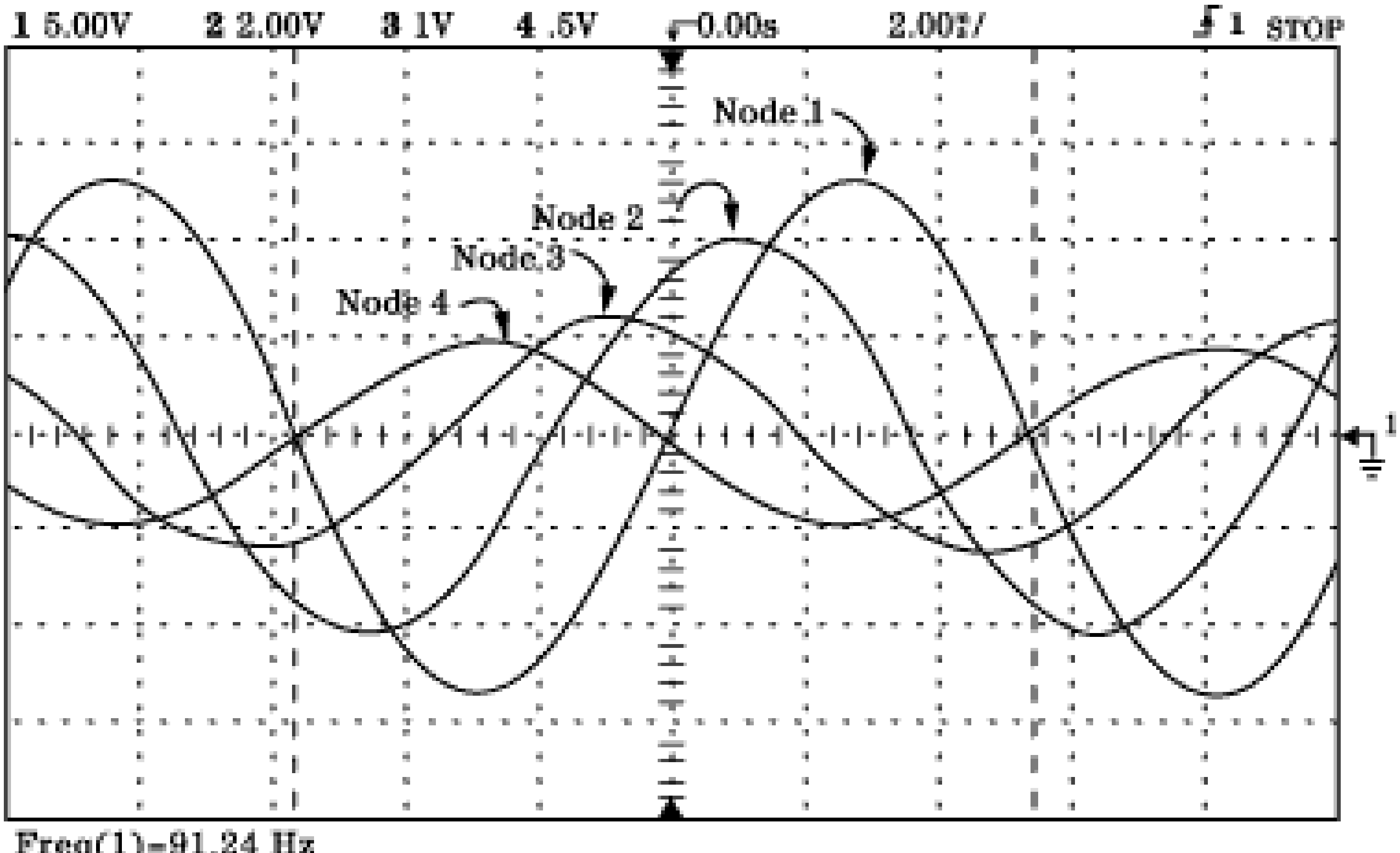
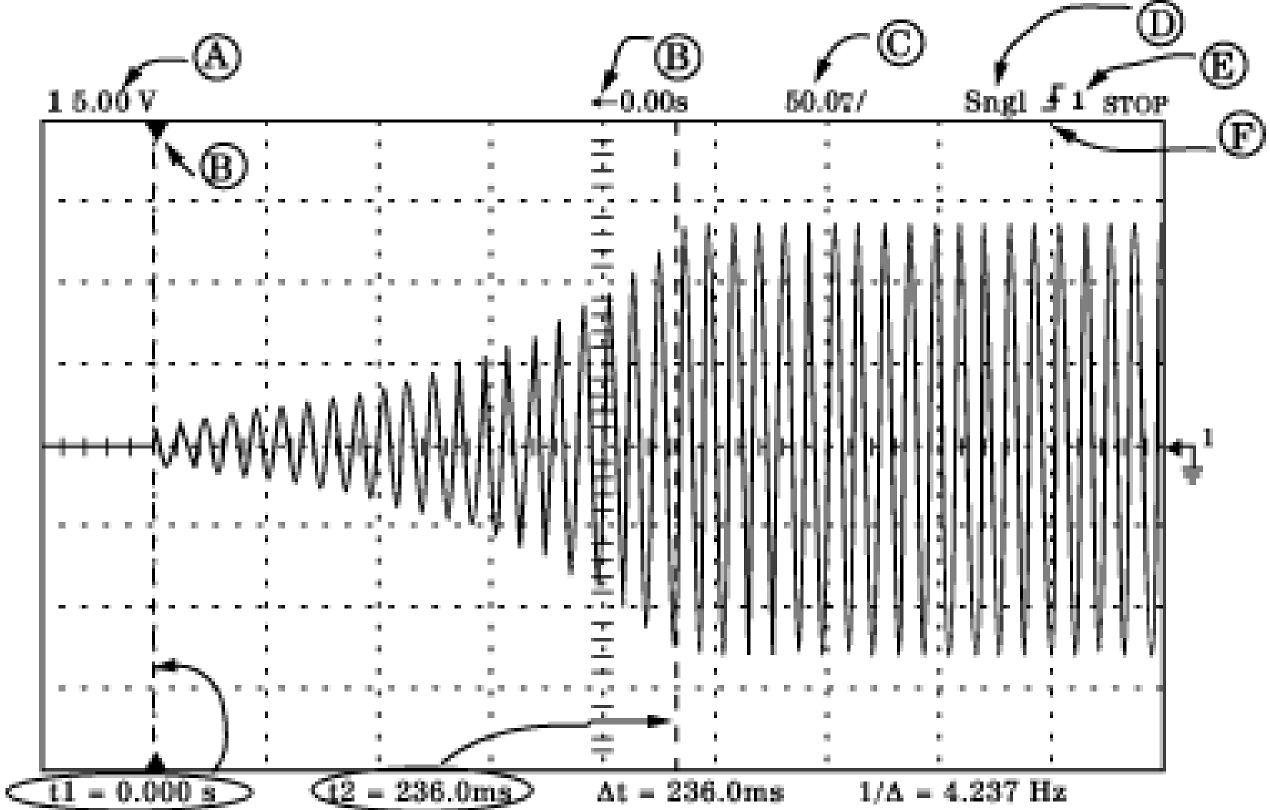


Figure 1 Voltages at Four Points in Phase-Shift Oscillator RC Network

Zaletanje oscilacija RC oscilatora (sa pomakom faze)



	State	Volts/Div	Position	Couplg	BW Lim	Invert	Probe
Chan 1	On	5.000 V	0.000 V	DC	Off	Off	10:1
Chan 2	Off	100.0mV	0.000 V	DC	Off	Off	1:1
Chan 3	Off	100.0mV	0.000 V	DC	---	---	1:1
Chan 4	Off	100.0mV	0.000 V	DC	---	---	1:1

	Mode	Main Time/Div	Main Delay	Time Ref	Delayed Time/Div	Delayed Delay
Horizontal	Normal	50.00ms/	0.000 s	Left	------------	------------

Trigger	Mode	Source	Level	Holdoff	Slope	Couplg	Reject	NoiseRej
	Single	Ch 1	1.094 V	200.0ns	Pos	DC	Off	Off

Display Mode: Normal

Cursors: t1=0.000 s t2=236.0us V1(1)=0.000 V V2(1)=0.000 V

Figure 2 - Start-up of RC Phase-Shift Oscillator

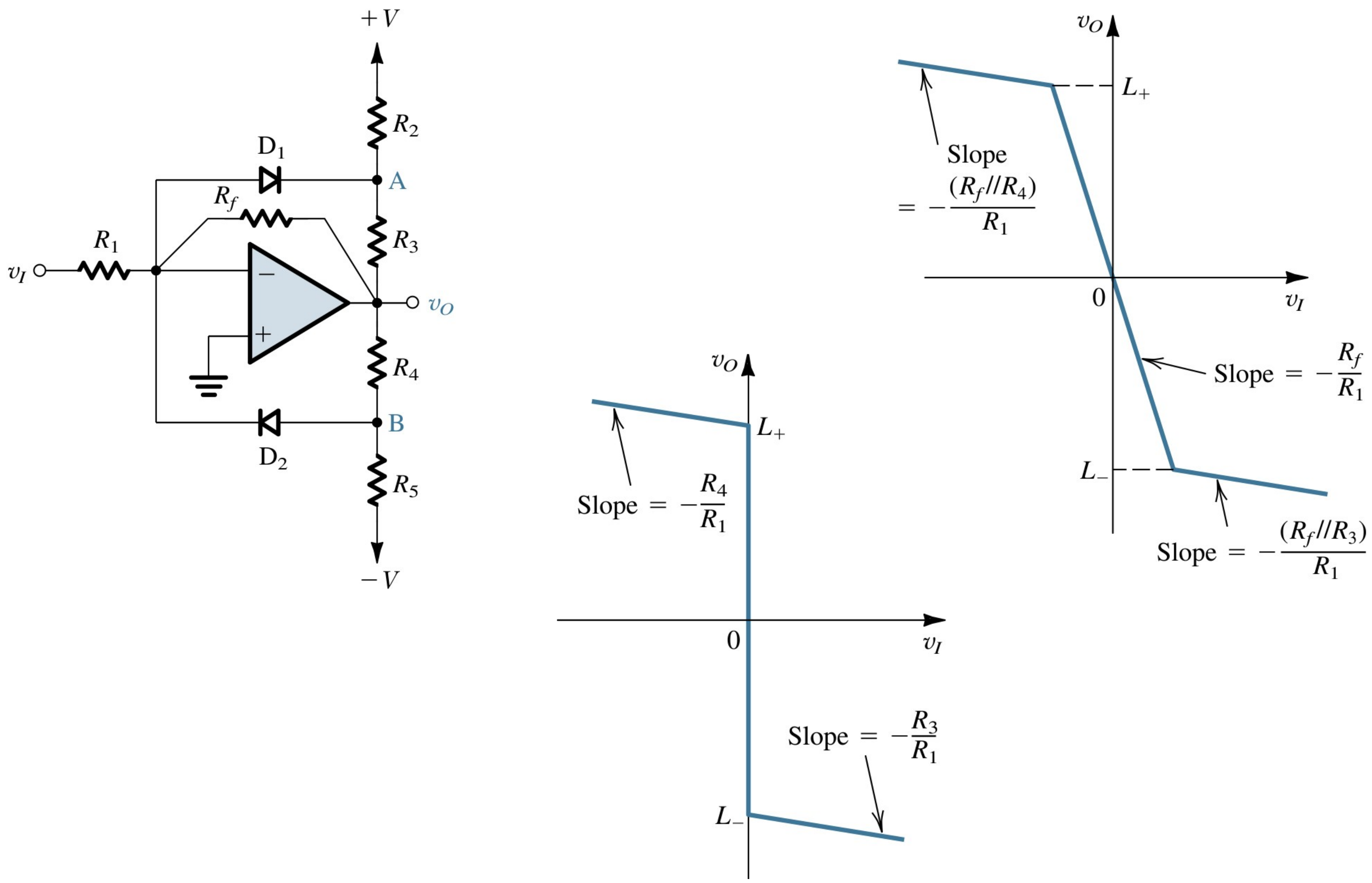


Fig. 12.3 (a) A popular limiter circuit. **(b)** Transfer characteristic of the limiter circuit; L_- and L_+ are given by Eqs. (12.8) and (12.9), respectively. **(c)** When R_f is removed the limiter turns into a comparator with characteristics shown.

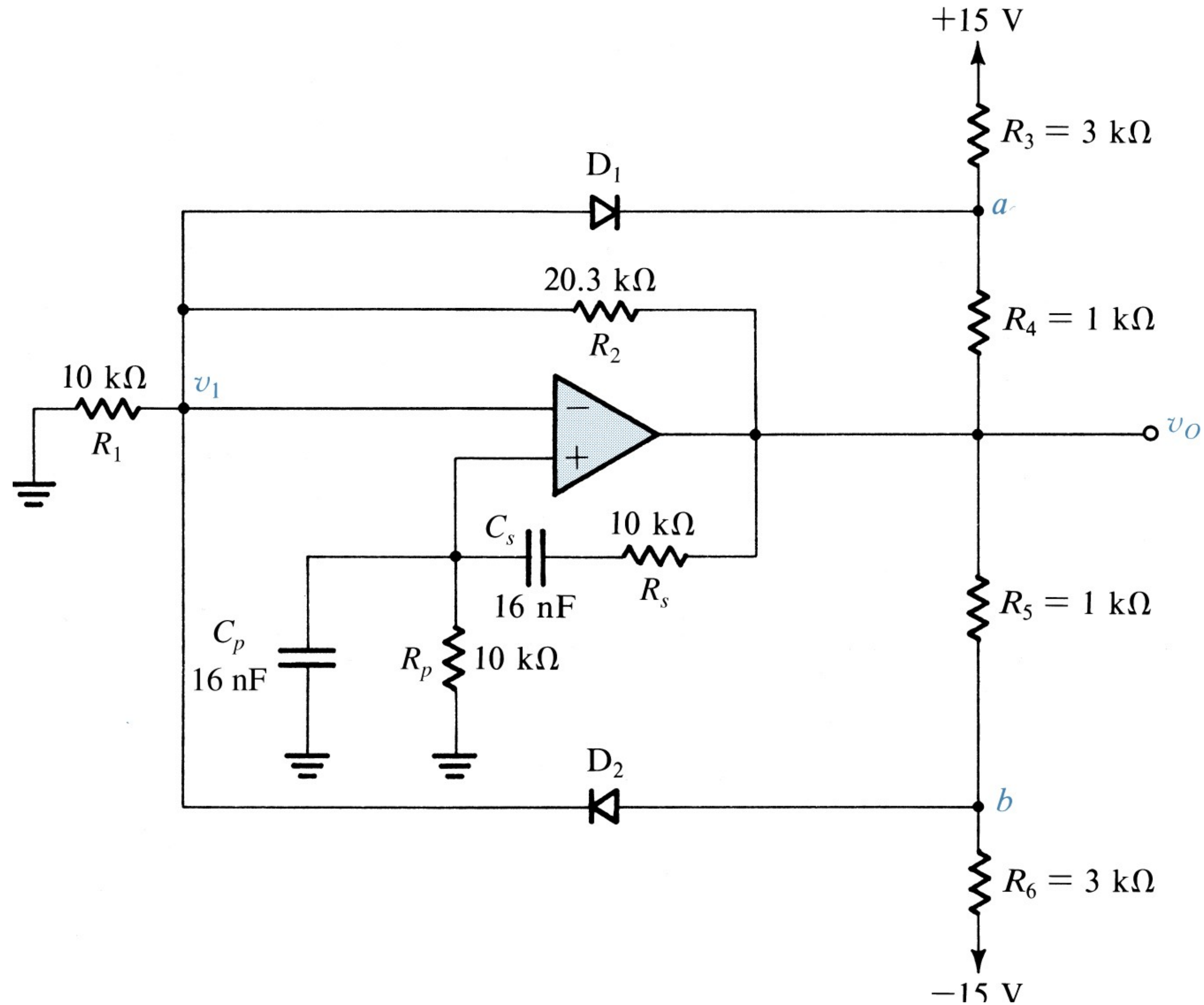


Fig. 12.5 A Wien-bridge oscillator with a limiter used for amplitude control.

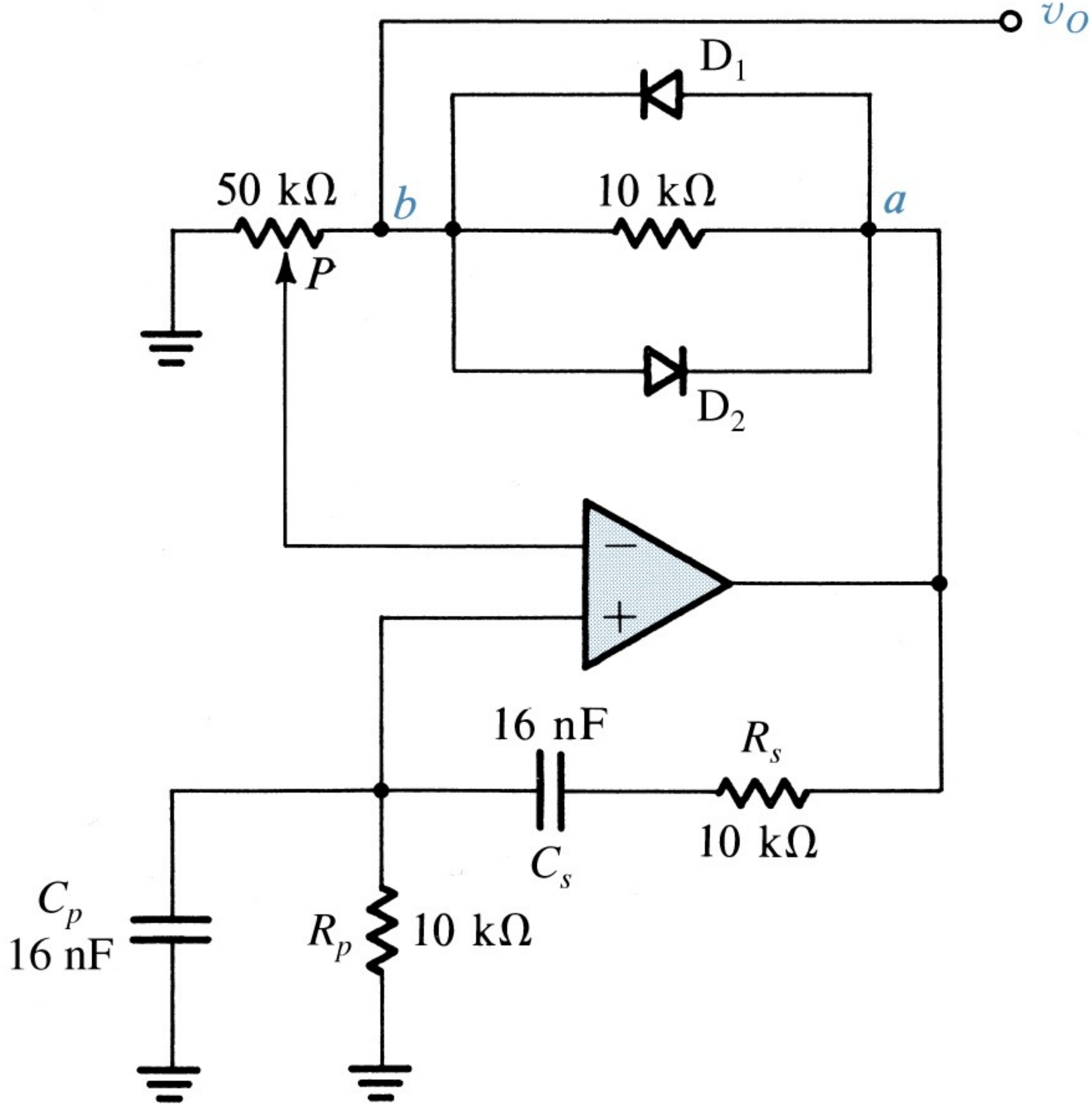


Fig. **12.6** A Wien-bridge oscillator with an alternative method for amplitude stabilization.

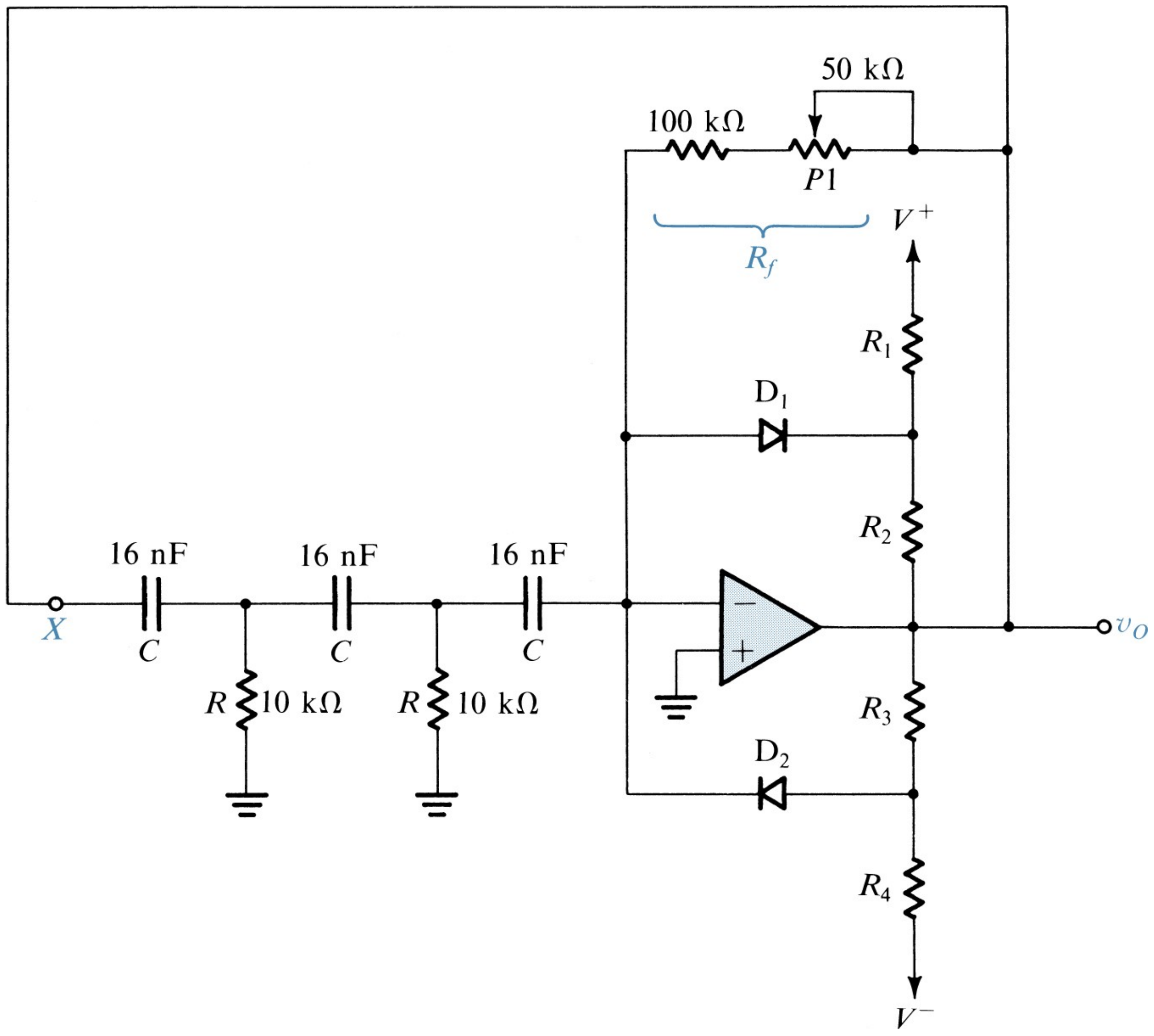


Fig. 12.8 Practical phase-shift oscillator with a limiter for amplitude stabilization.

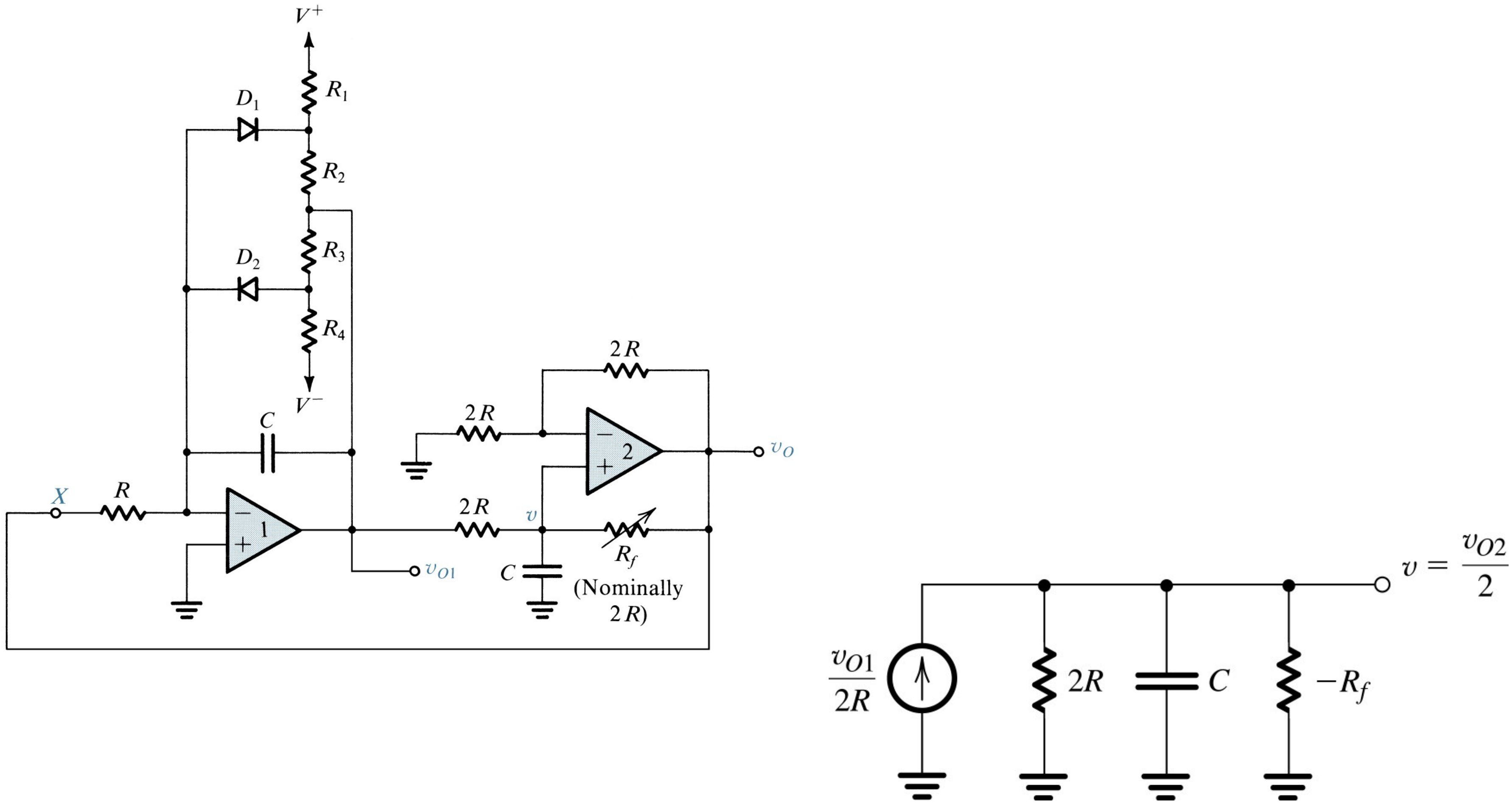
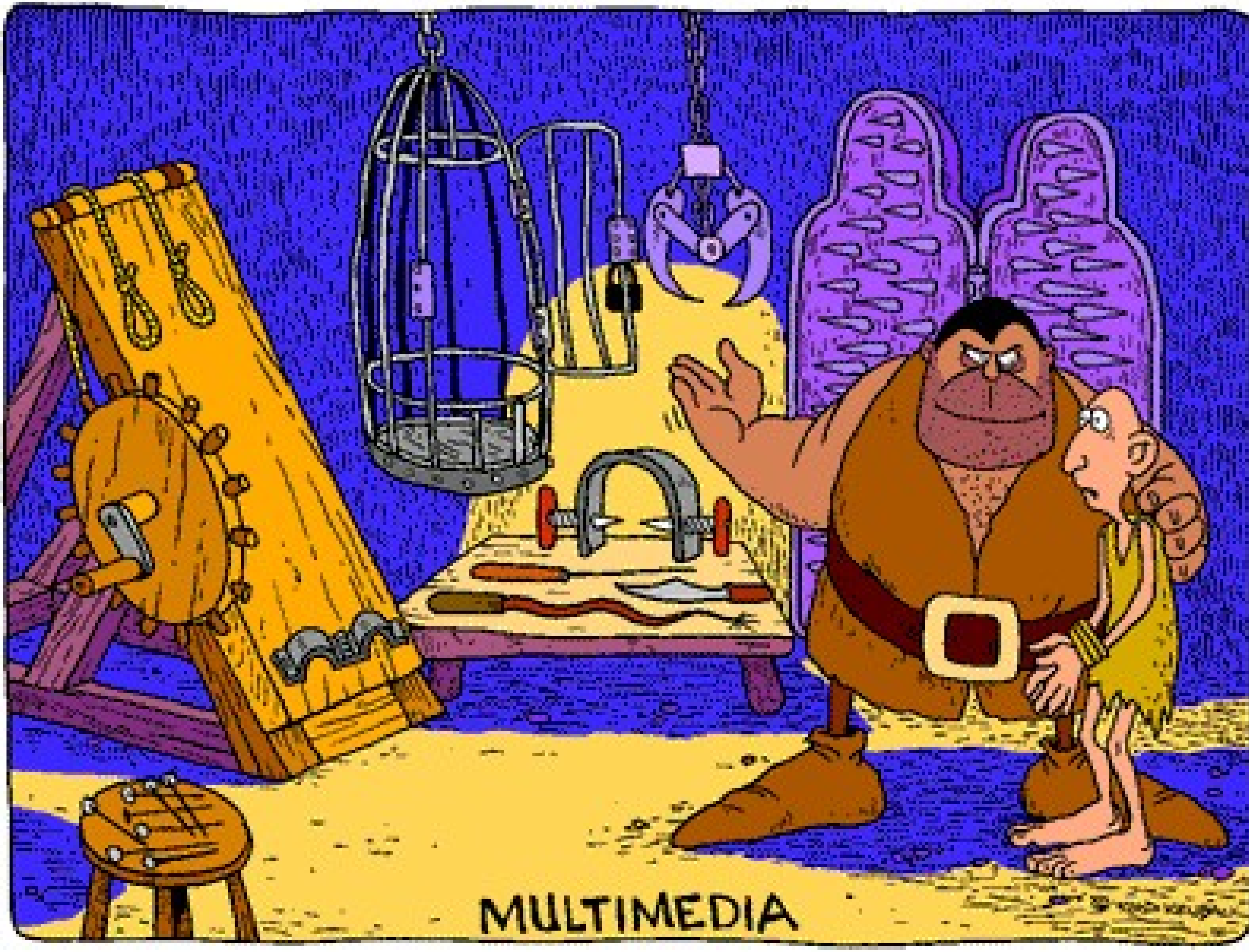


Fig. 12.9 (a) A quadrature oscillator circuit. **(b)** equivalent circuit at the input of op amp 2.

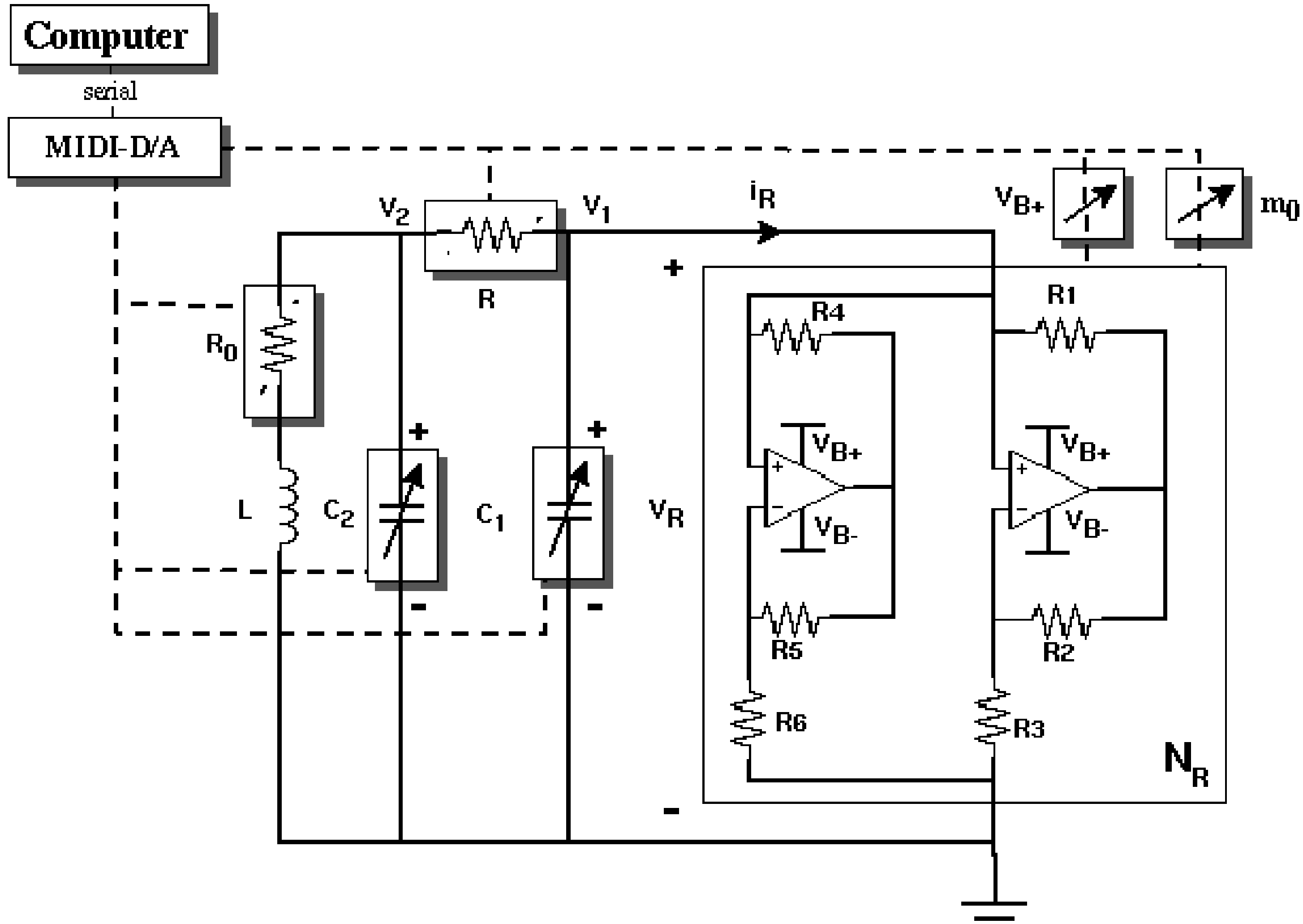

MULTIMEDIA

http://www.ccsr.uiuc.edu/People/gmk/Projects/ChuaSoundMusic/

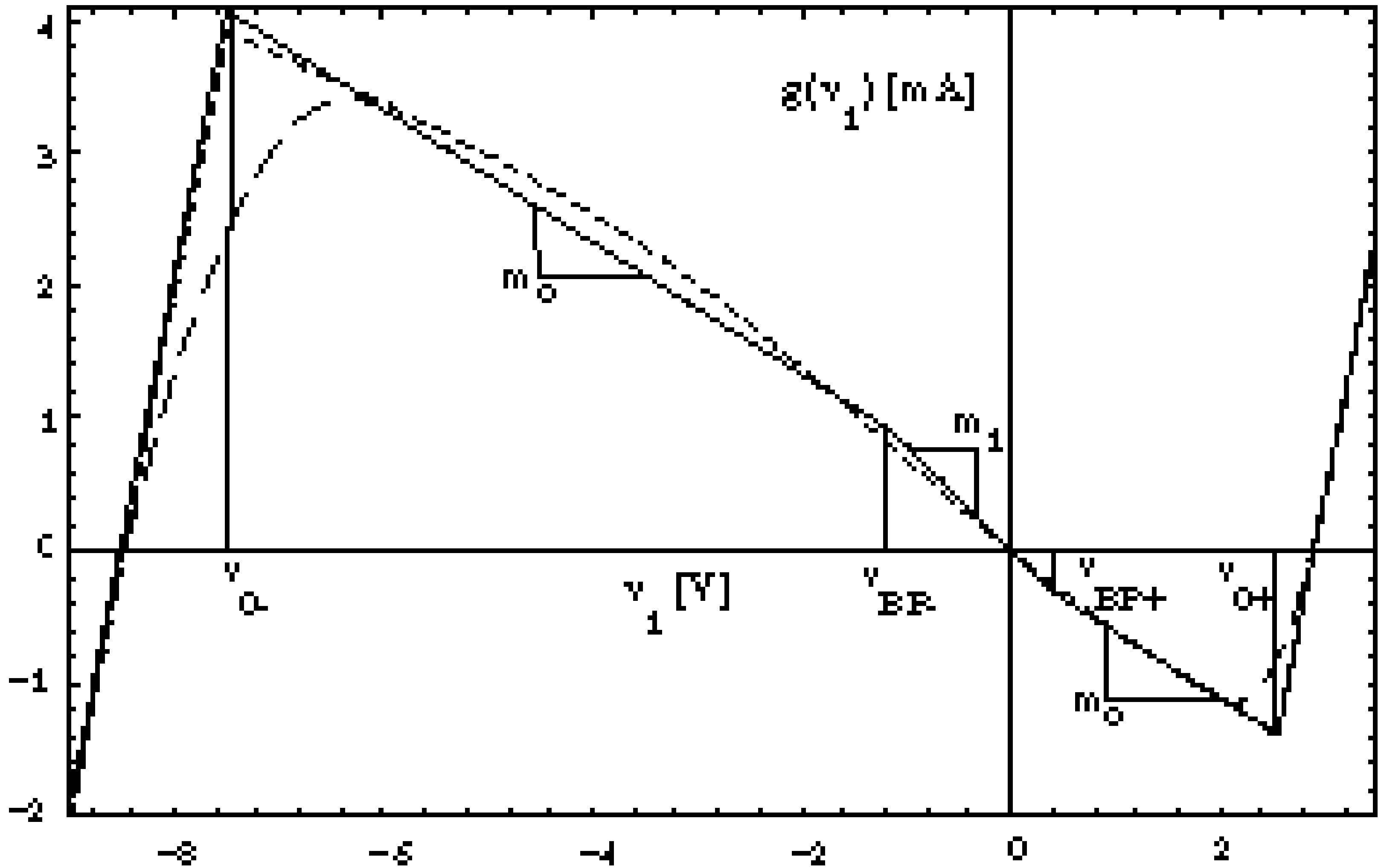
Chua's Oscillator: Applications of Chaos to Sound and Music

Chua oscilator

http://www.ccsr.uiuc.edu/People/gmk/Projects/ChuaSoundMusic/



Nelinearna otpornost NR



RC oscilatori

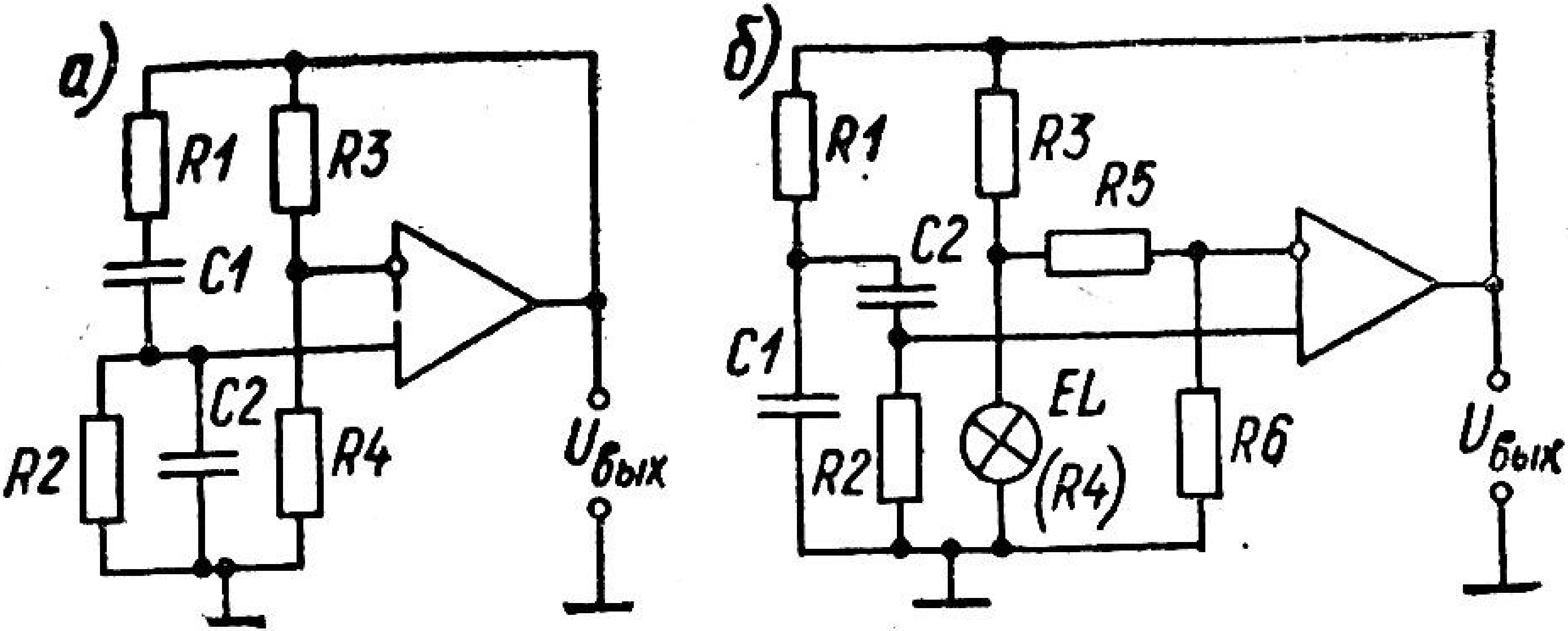


Рис. 3.10. Схемы гармонических *RC*-генераторов

RC oscilatori sa Nortonovim OP

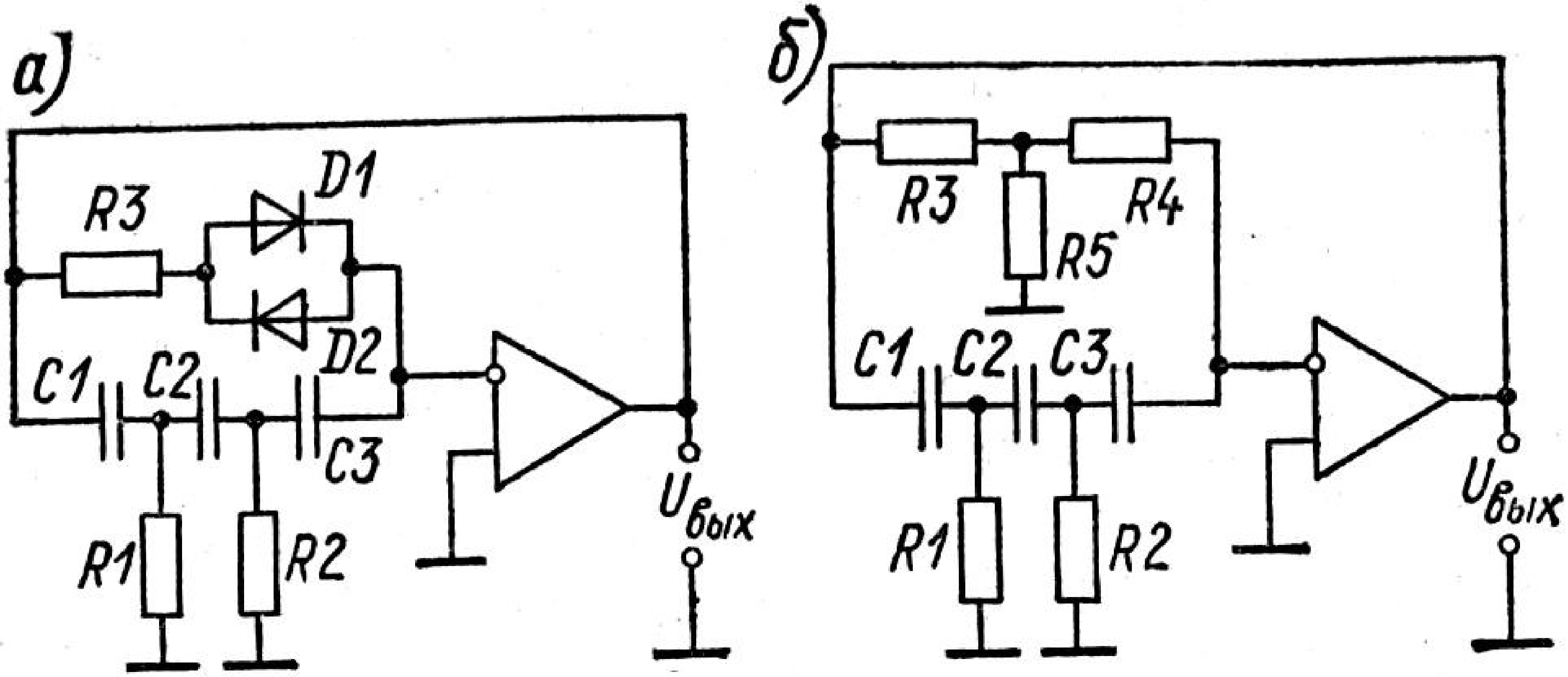
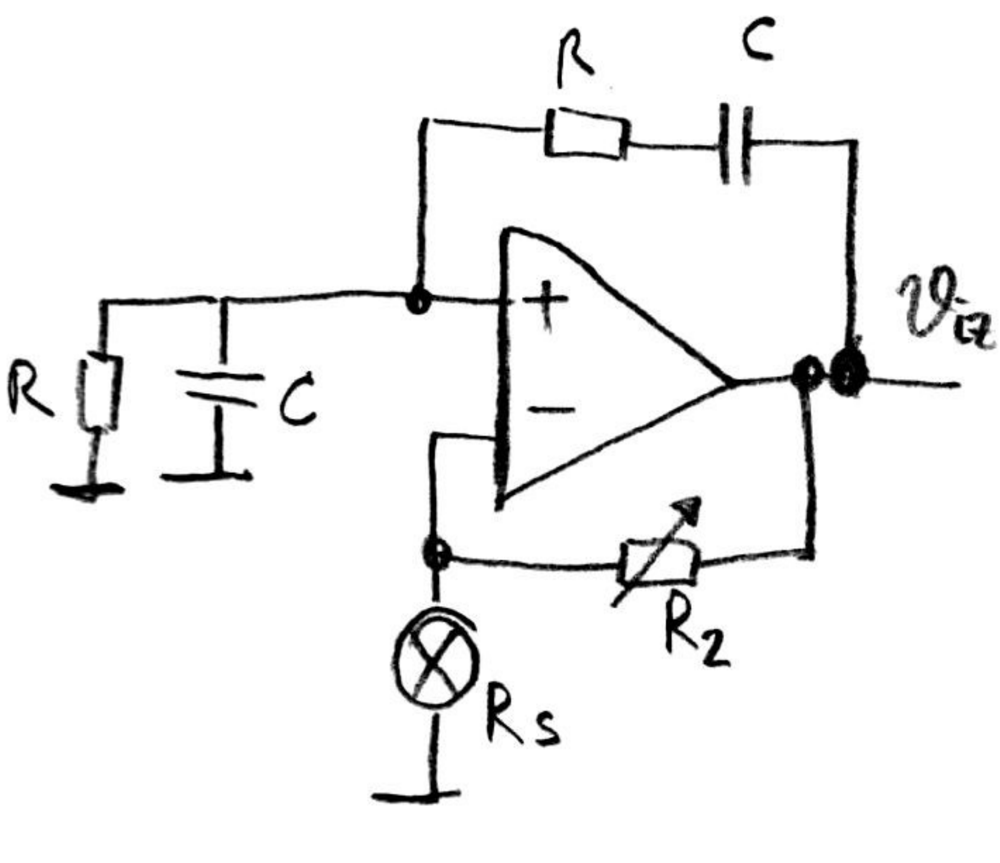


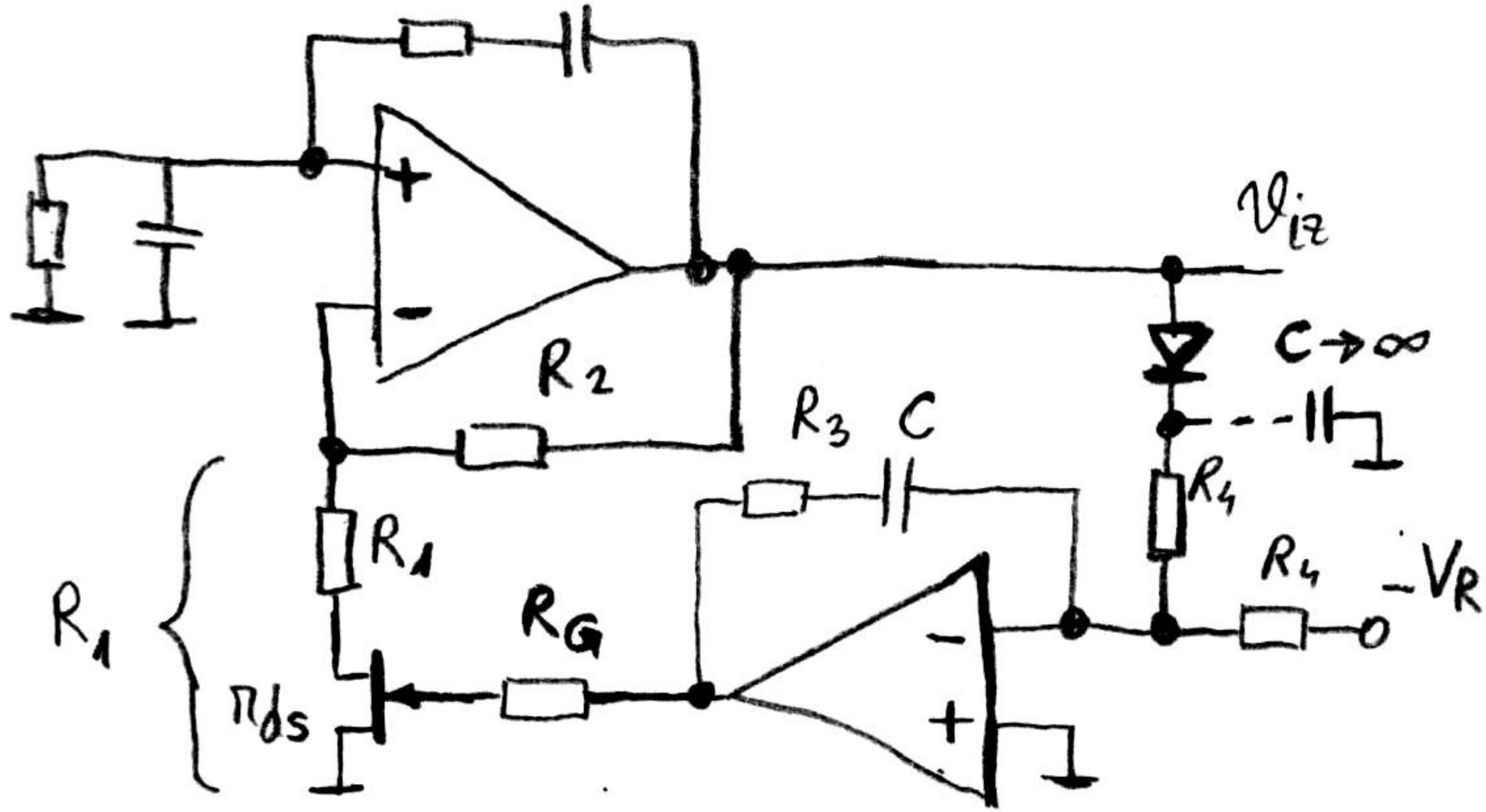
Рис. 3.11. Схемы *RC*-генераторов с потенциально-токовыми избирательными цепями

Regulacija amplitude oscilacija pomocu termozavisnog otpora Rs

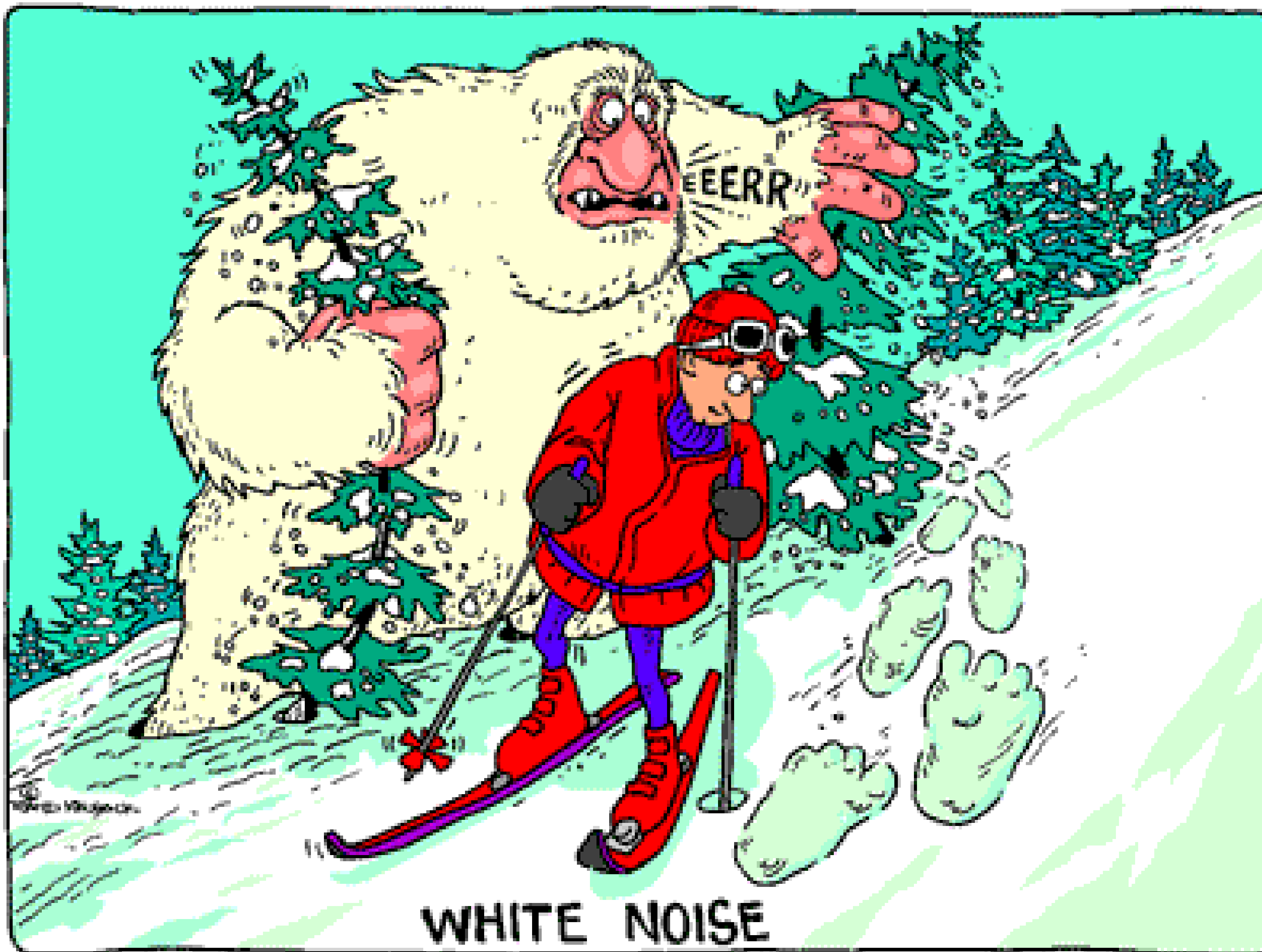


$V_m \nearrow$, $I_s \nearrow$, $P_s \nearrow$, $T_s \nearrow$, $R_s \nearrow$, $A\beta \downarrow$, $V_m \downarrow$

Automatska regulacija amplitude

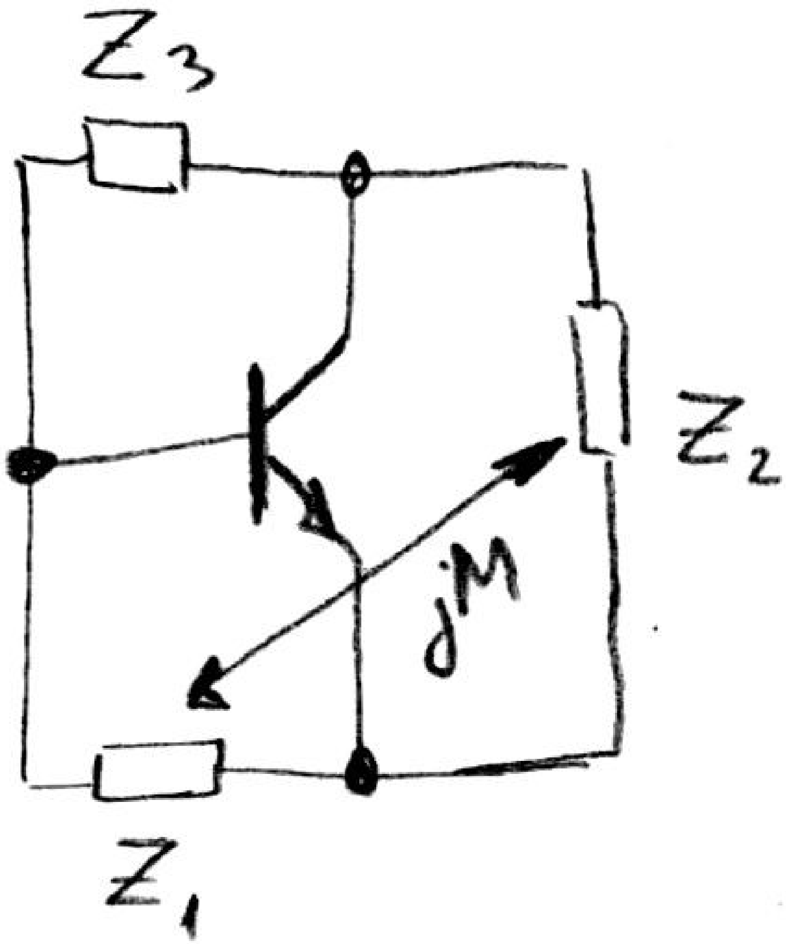


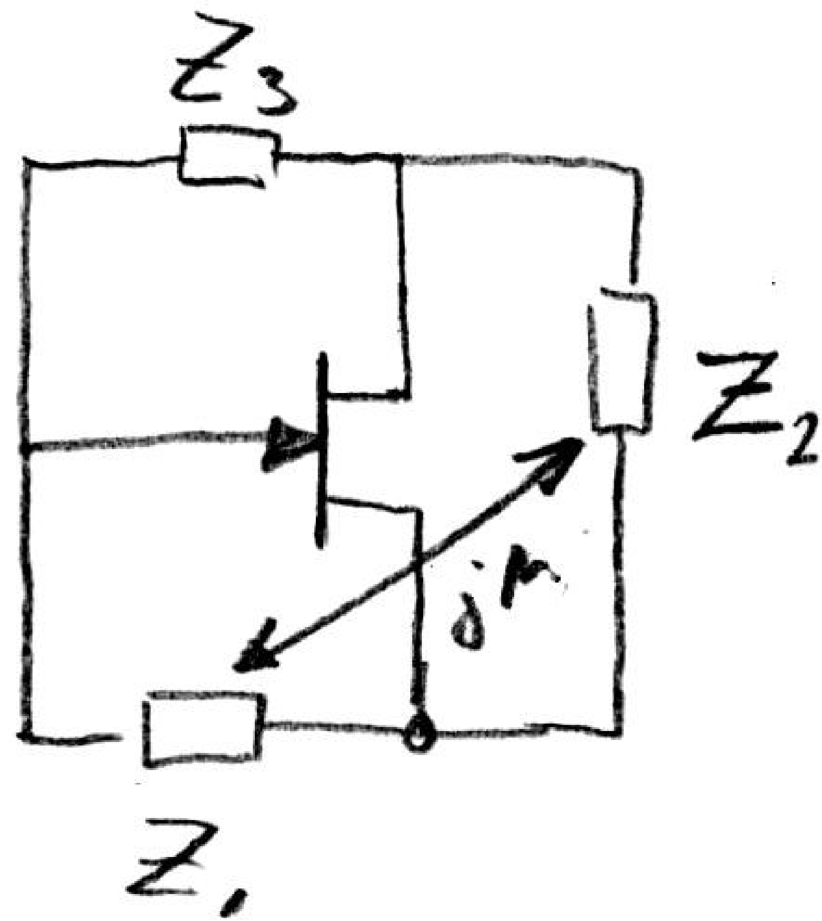
$V_m \uparrow,\ v^- \nearrow,\ v_G \downarrow,\ r_{ds} \uparrow,\ A\beta \downarrow,\ V_m \downarrow$



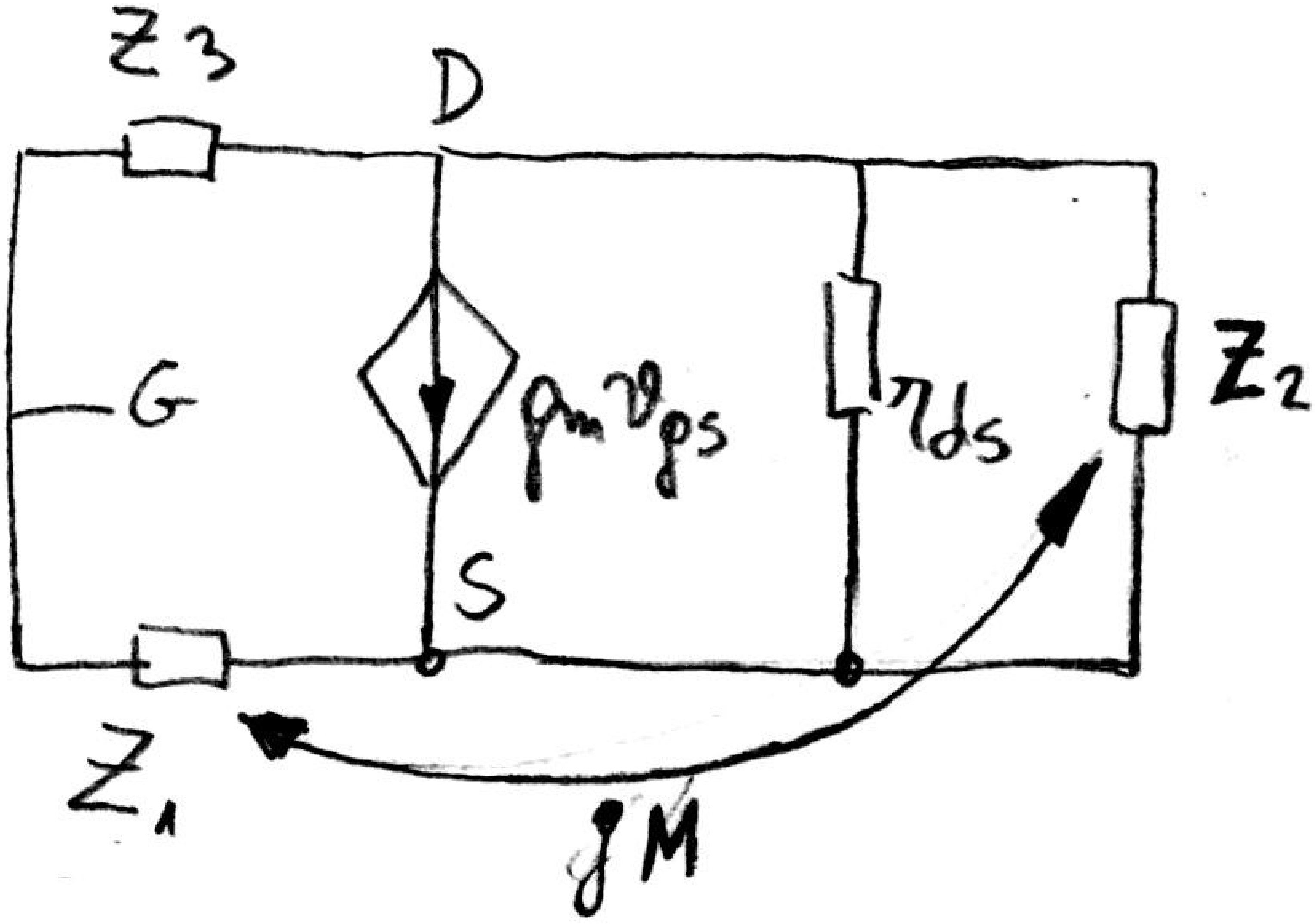
WHITE NOISE

Oscilatori u 3 tacke (BCE ili GDS)





Model za male signale za oscilator u 3 tacke



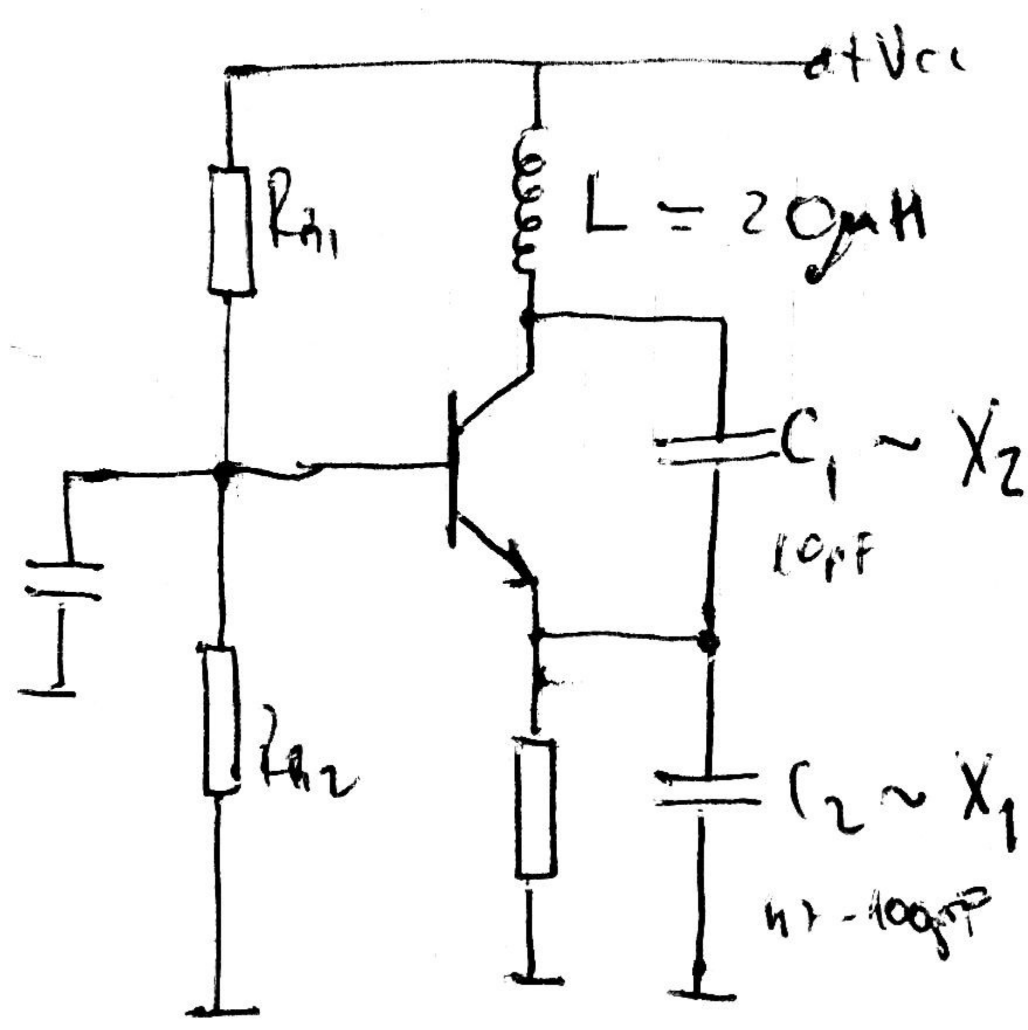
Neodredjenost amplitude kod oscilatora => determinanta=0

$$\mathrm{Det} = 0$$

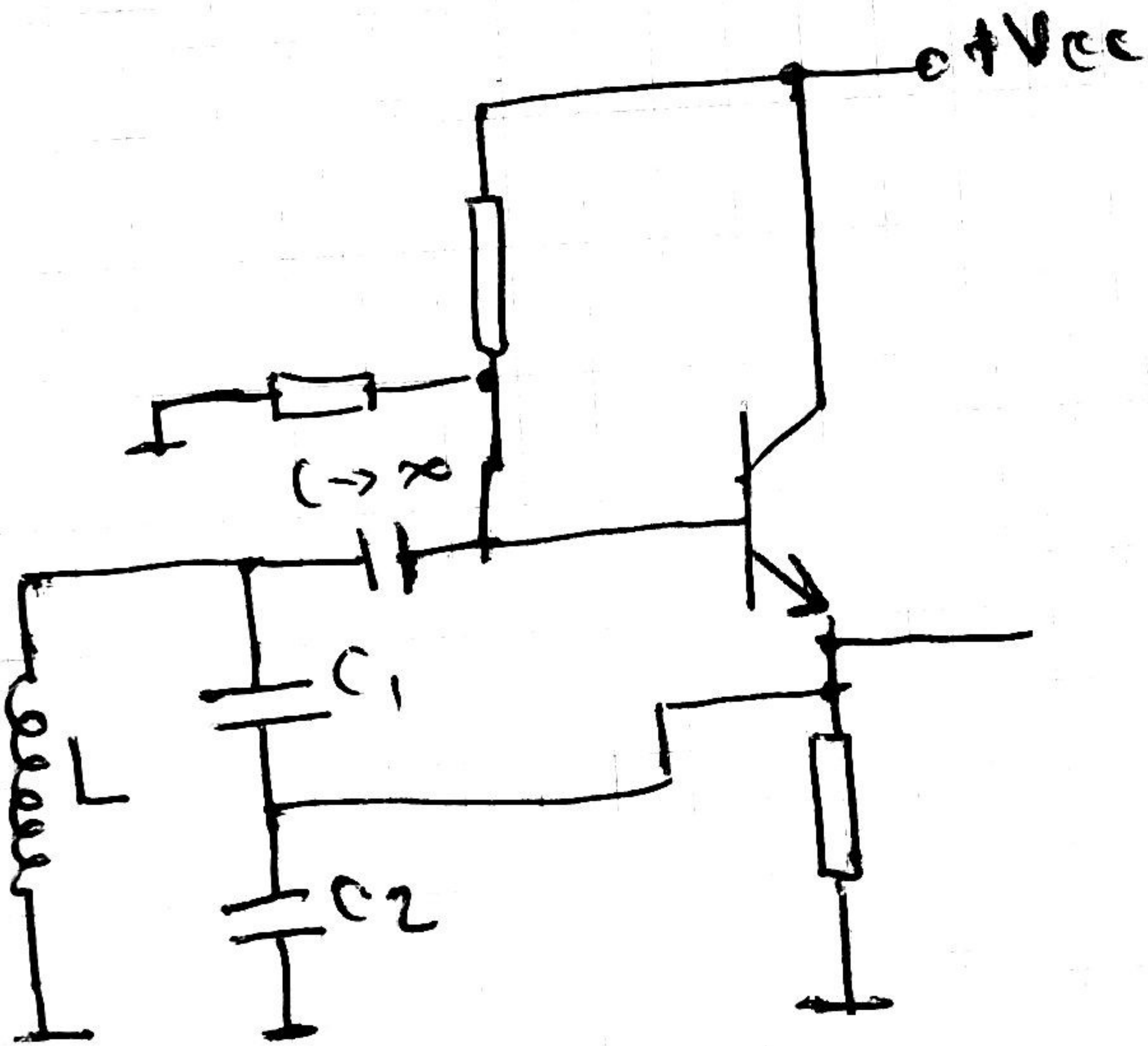
=> $$\begin{cases} \mathrm{Im}\{\mathrm{Det}\} = 0 \\ \mathrm{Re}\{\mathrm{Det}\} = 0 \end{cases}$$

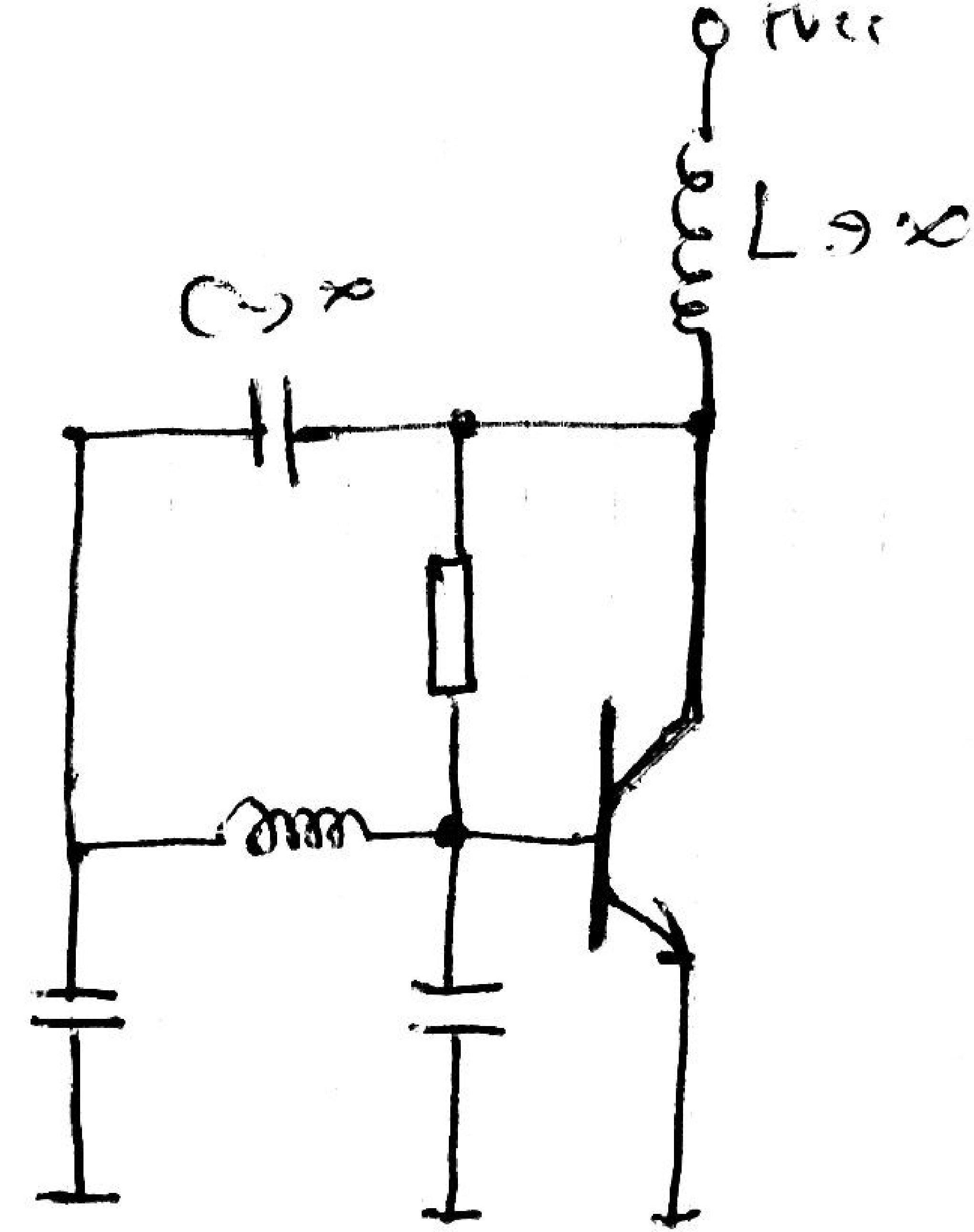
=> $$\begin{cases} X_1 + X_2 + X_3 \pm 2X_m = 0 \\ g_m r_{ds} \geq \dfrac{X_2 \pm X_m}{X_1 \pm X_m} \end{cases}$$

Oscilator u 3 tacke - primjer 1



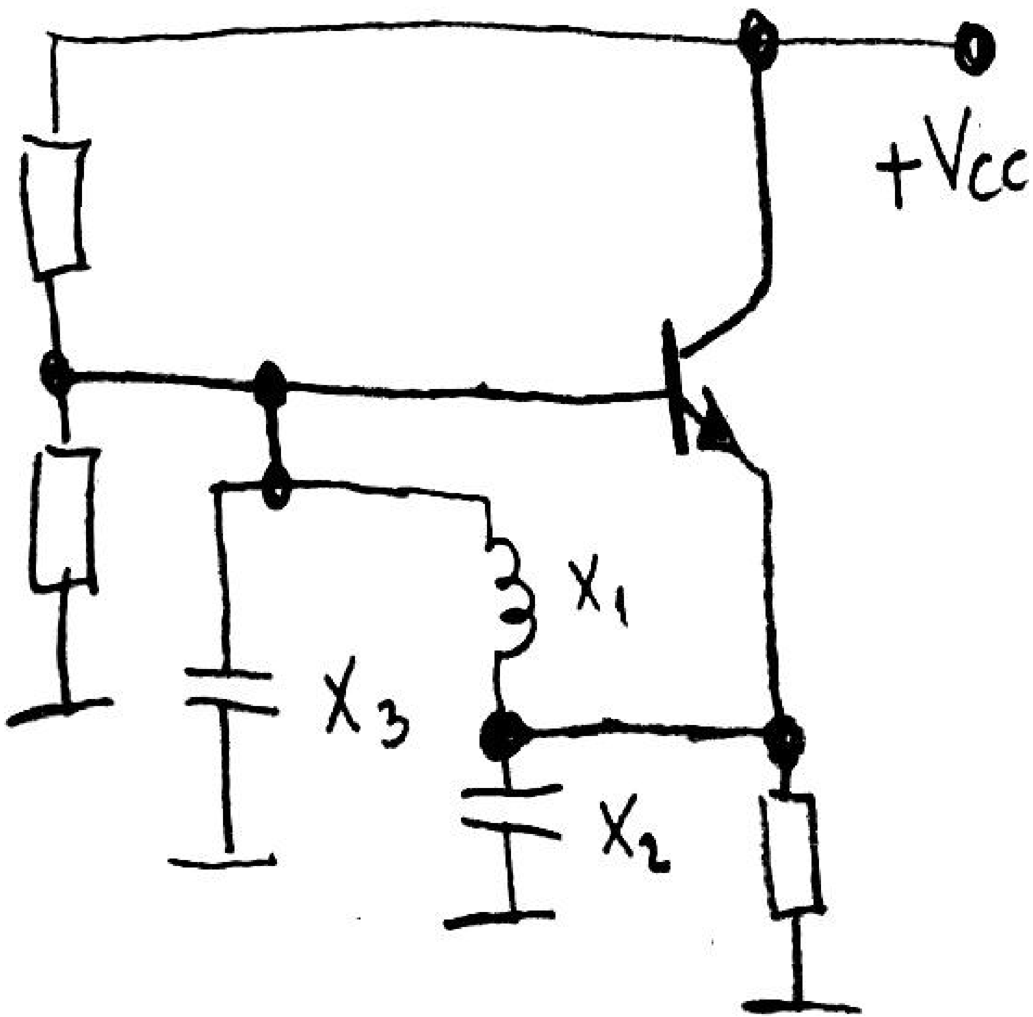
Oscilator u 3 tacke - primjer 2



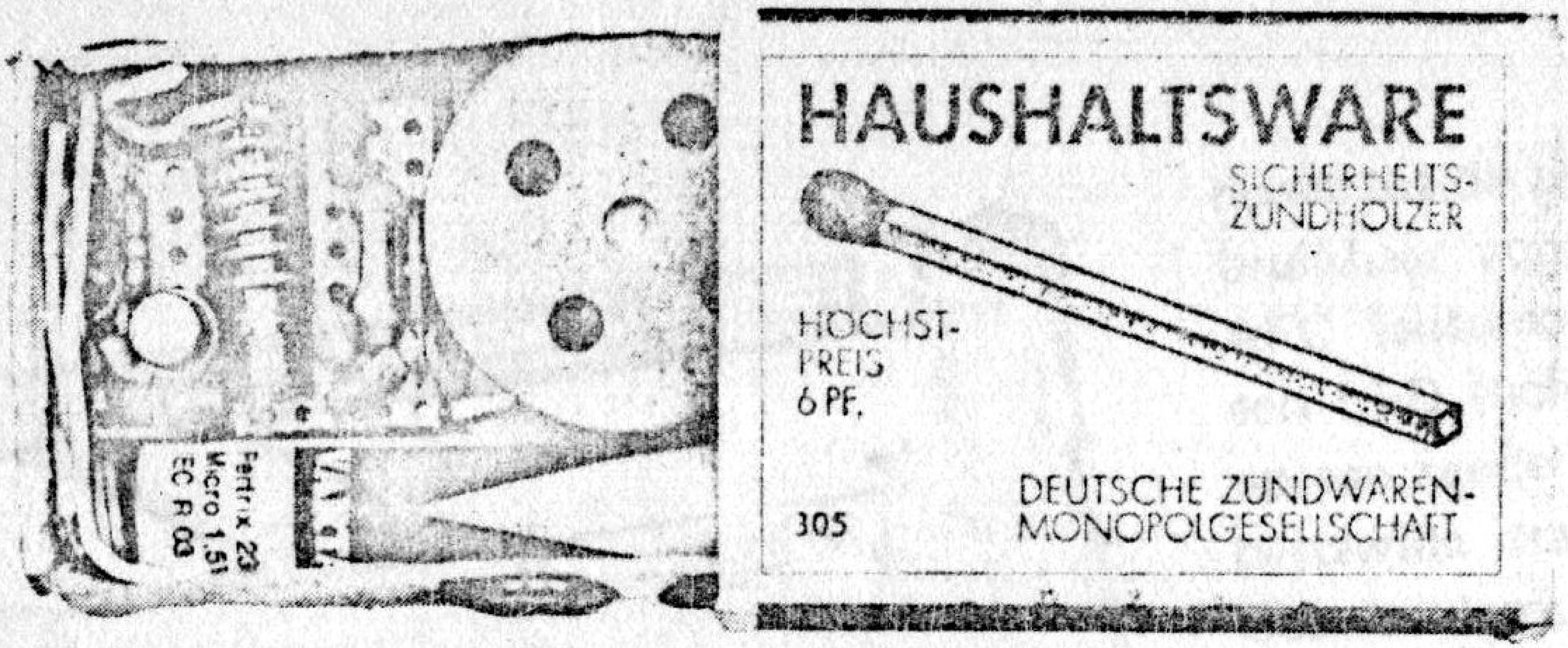


Oscilator u 3 tacke - primjer 3

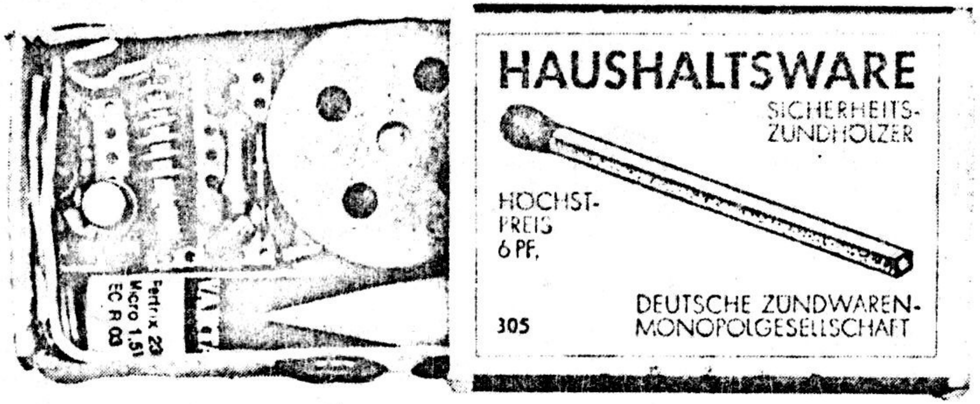
Ovo kole ne moze da osciluje jer su X1 i X2 reaktanse razlicitog znaka



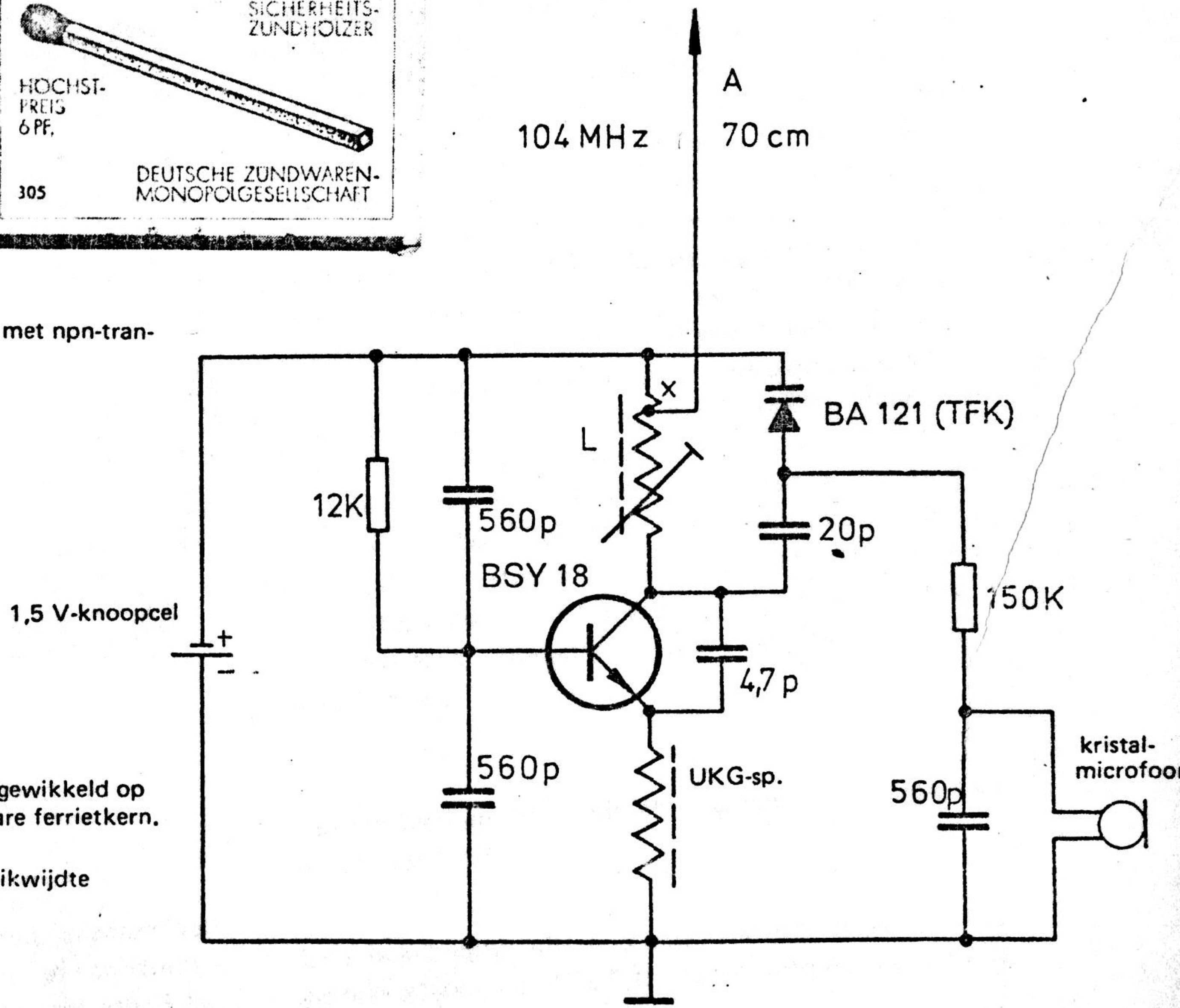
Minijaturni spijunski prisluskivac
- oscilator sa FM -



Afb. 2.
Miniatuurspion-standaardschakeling met npn-transistor voor 1,5 V.



Afb. 2.
Miniatuurspion-standaardschakeling met npn-transistor voor 1,5 V.



Afb. 1.
L = 7 wdg. zilverdraad (ϕ 0,8 mm), gewikkeld op spoelkern (ϕ 5 mm) met draaibare ferrietkern.
x = aftakking bij 0,5 . . . 1 wdg.
zendfrequentie ca. 100 MHz; reikwijdte 100 . . . 200 m.