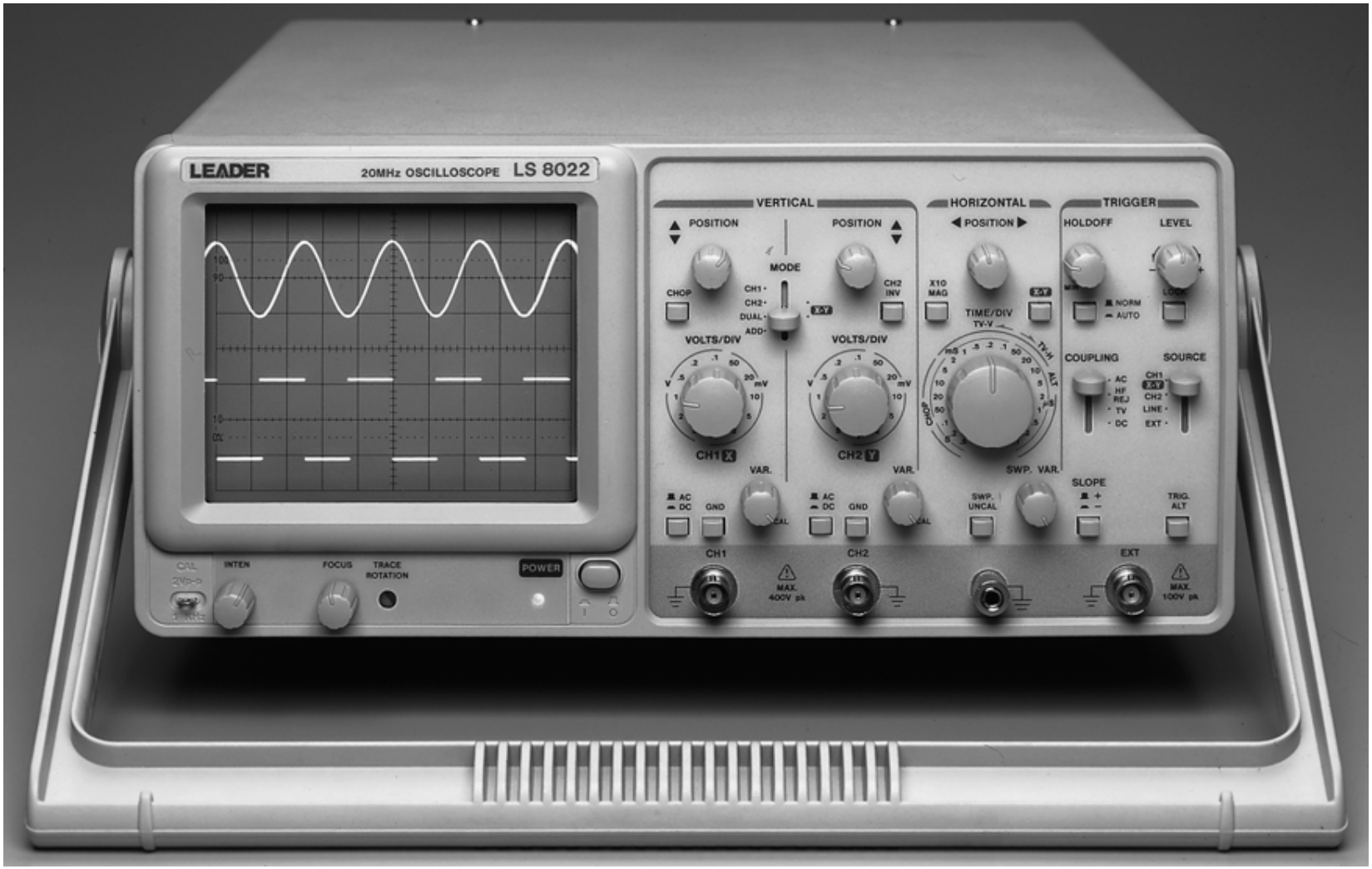
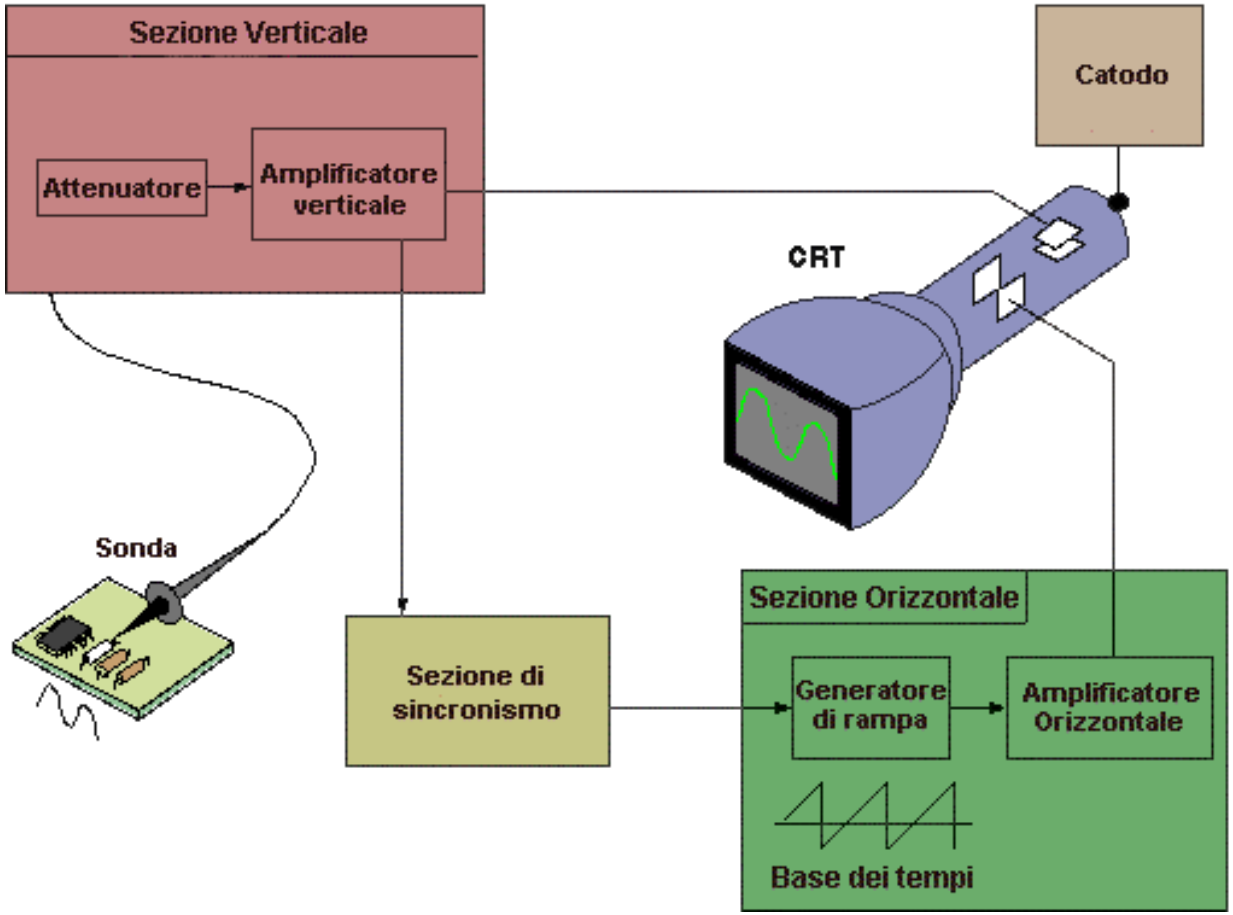
Oscilloscopio analogico

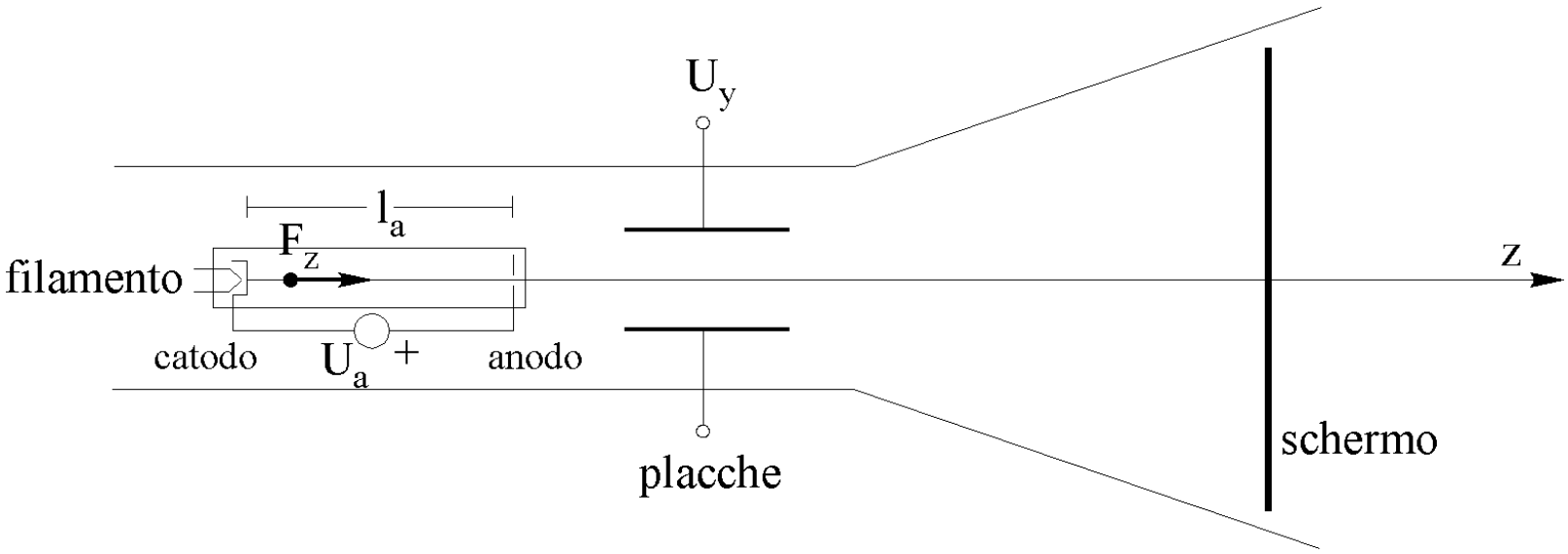


Oscilloscopio analogico

Schema di principio



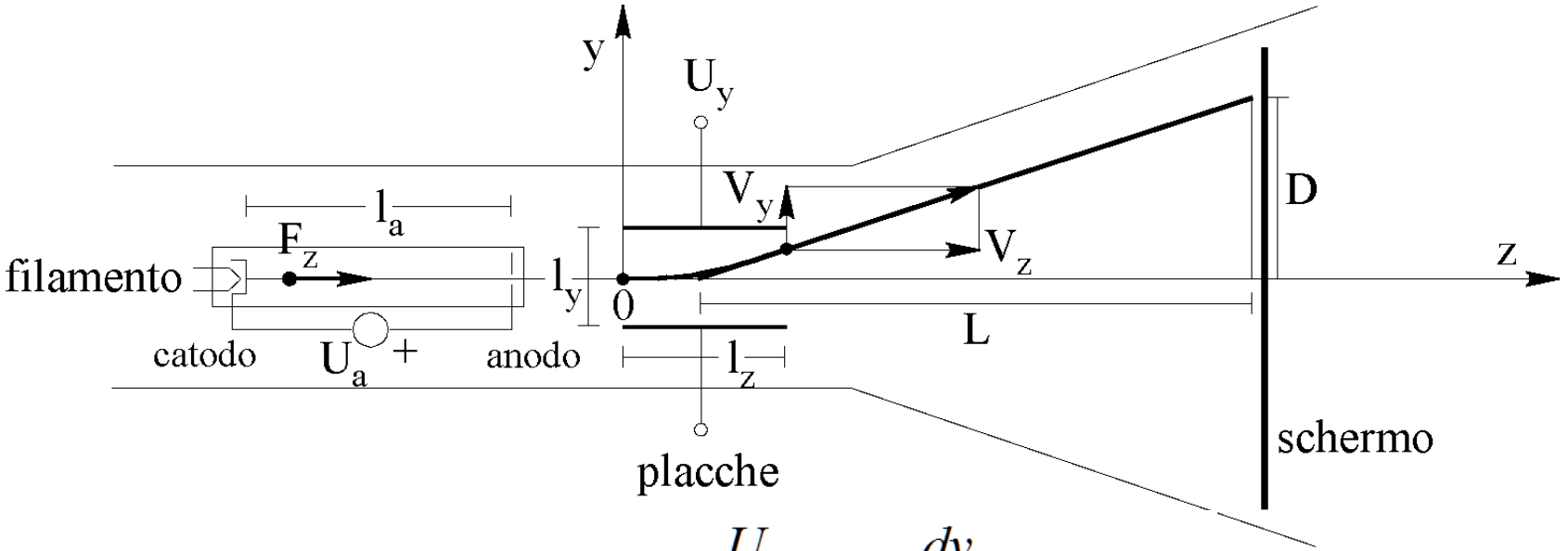
Cathode Ray Tube - CRT



$$F_z = q_e E_z = q_e \frac{U_a}{l_a}$$

$$W_E = \frac{1}{2} m_e V_z^2 = F_z l_a = q_e U_a \longrightarrow V_z = \sqrt{\frac{2 q_e U_a}{m_e}}$$

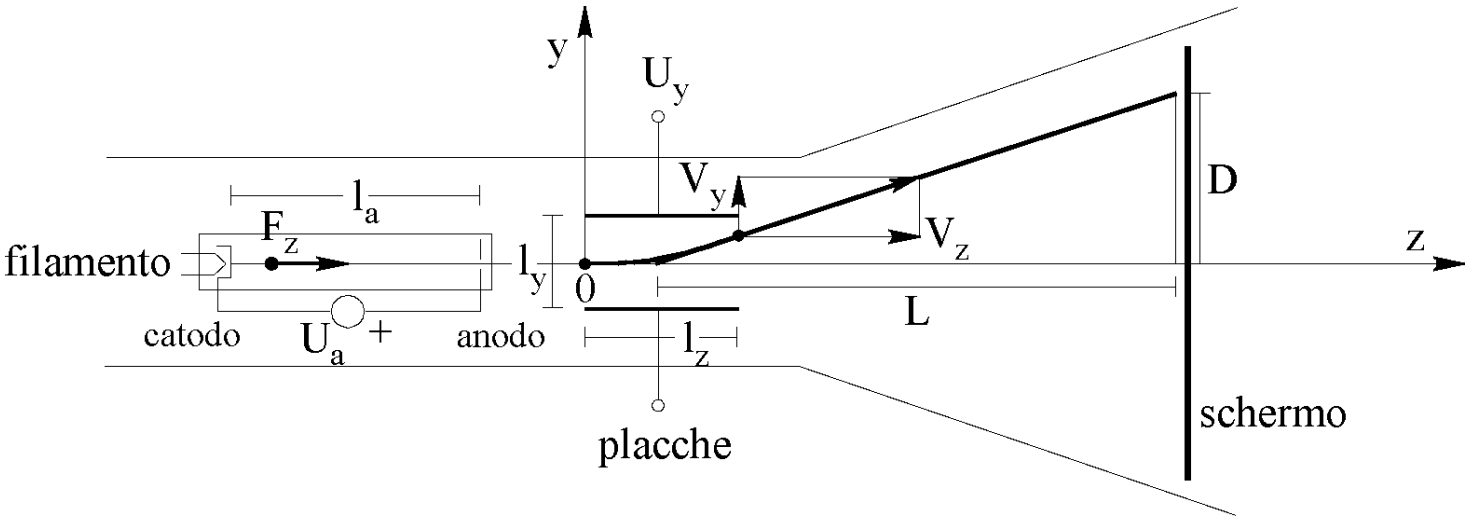
Deflessione verticale del fascio elettronico



$$F_y = q_e \frac{U_y}{l_y} = m_e \frac{dv_y}{dt}$$

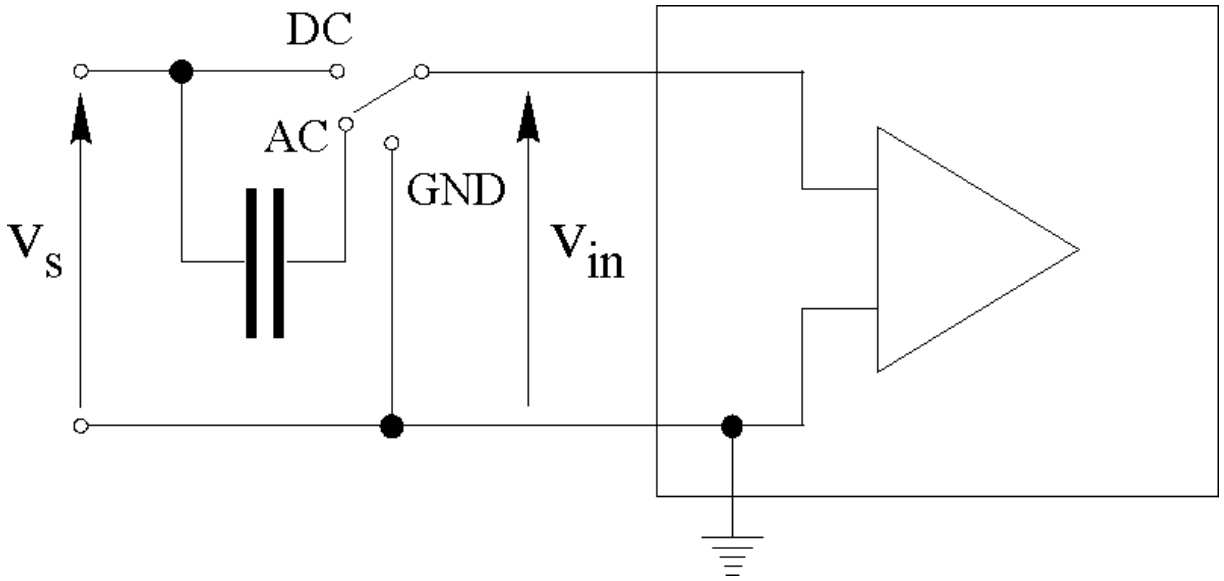
$$v_y = \frac{q_e U_y}{m_e l_y} t \quad \rightarrow \quad V_y = \frac{q_e U_y}{m_e l_y} \frac{l_z}{V_z}$$

Deflessione sullo schermo

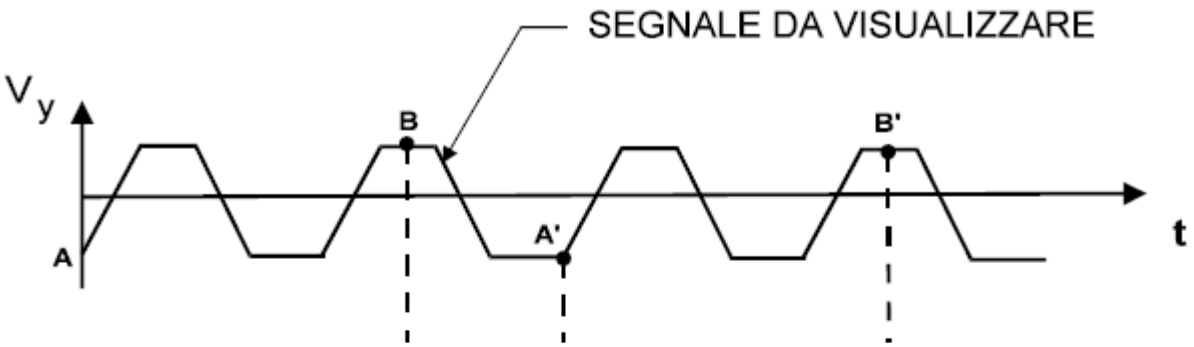


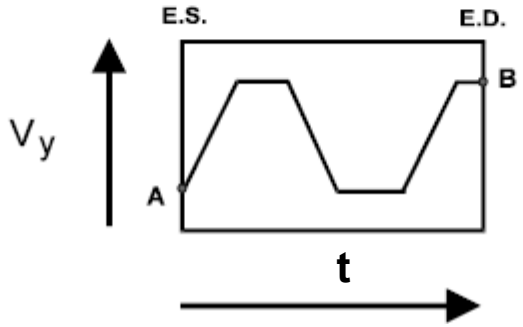
$$\frac{D}{L} = \frac{V_y}{V_z} = \frac{q_e U_y}{m_e l_y} \cdot \frac{l_z m_e}{2 q_e U_a} = \frac{1}{2} \frac{l_z}{l_y} \frac{U_y}{U_a}$$

Il canale verticale



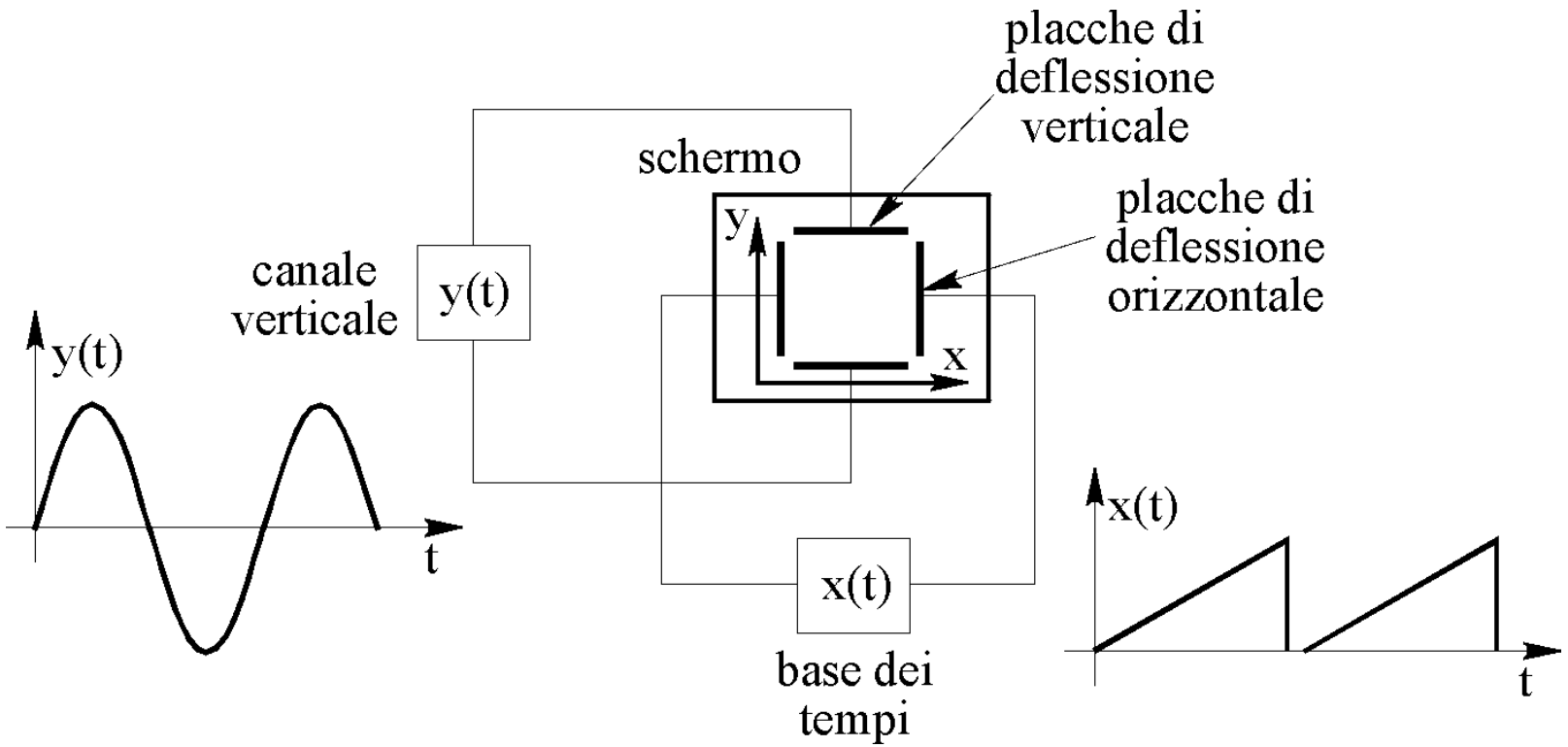
Visualizzazione segnali in funzione del tempo



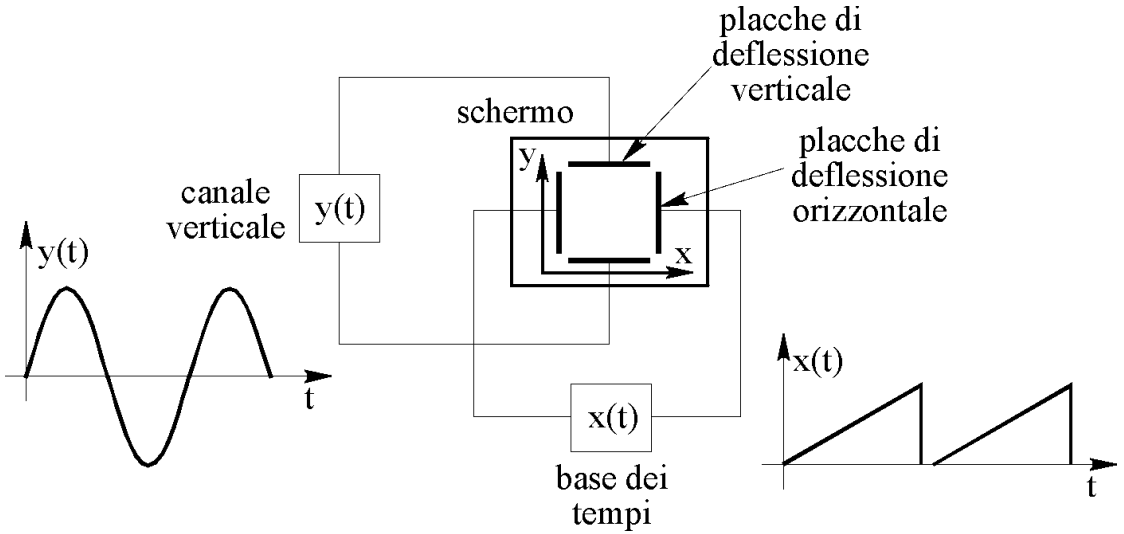


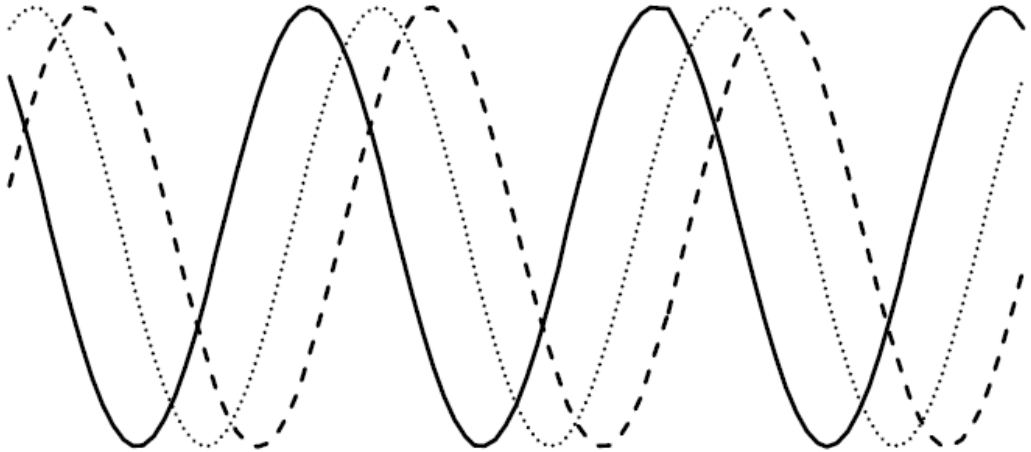
La base dei tempi

(*sweep* orizzontale)

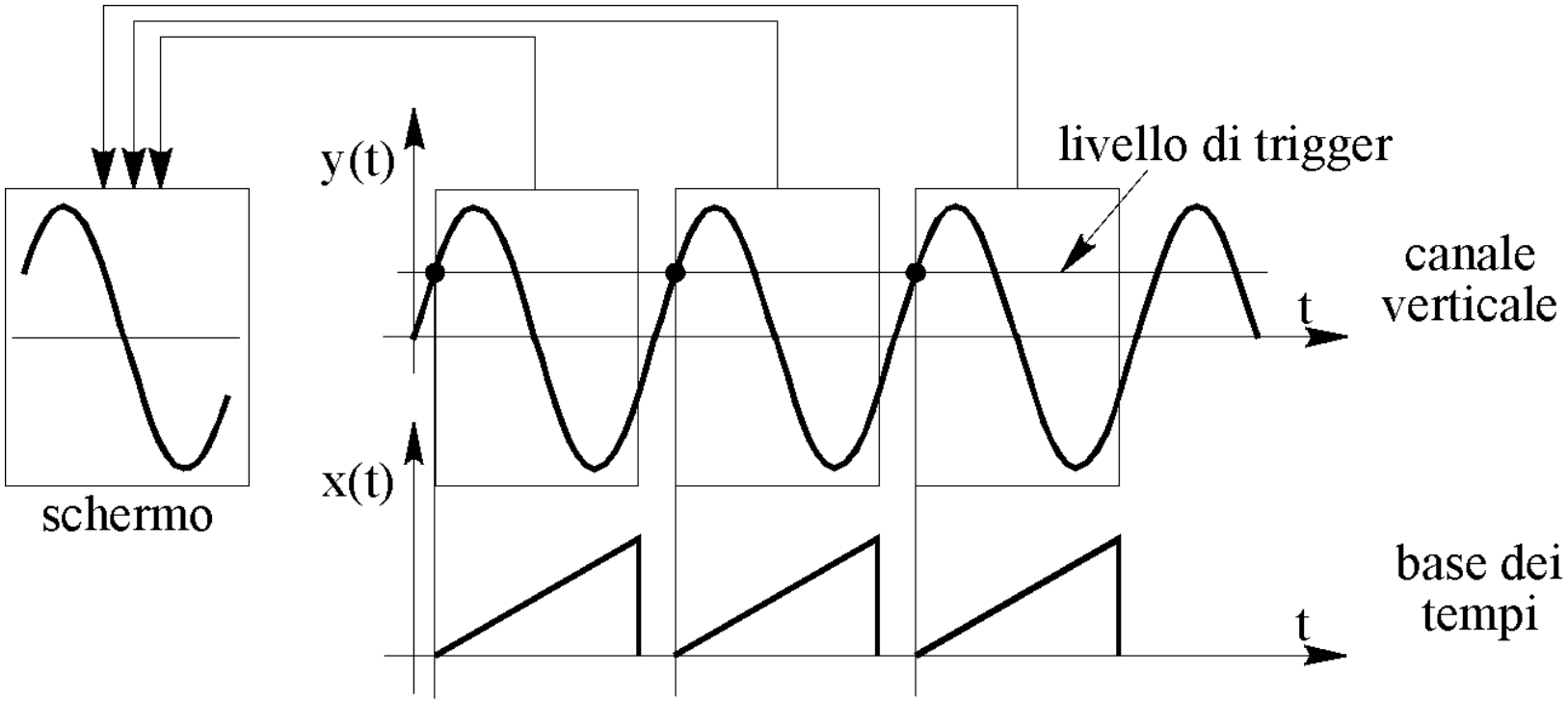


Base dei tempi non sincronizzata

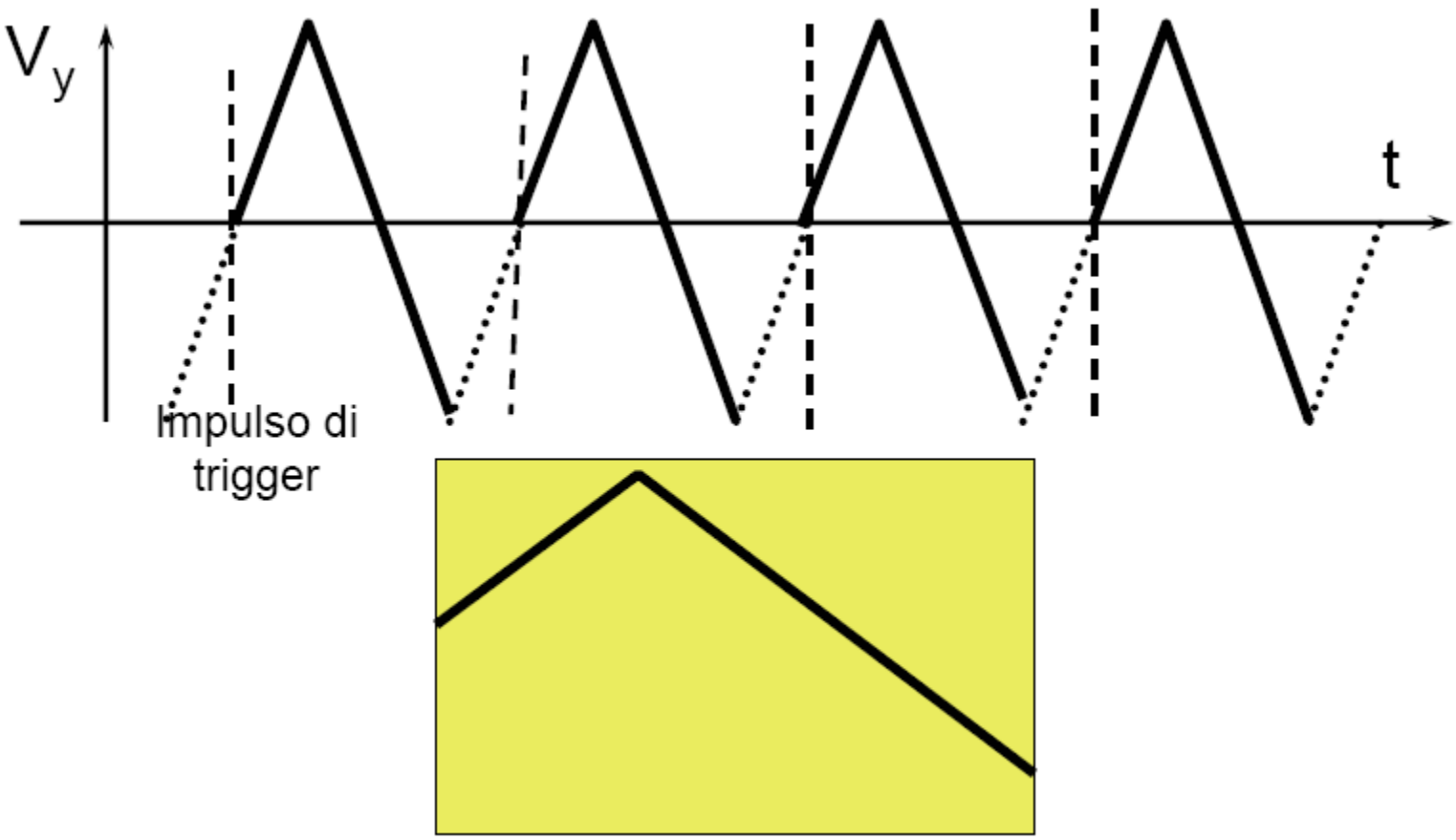




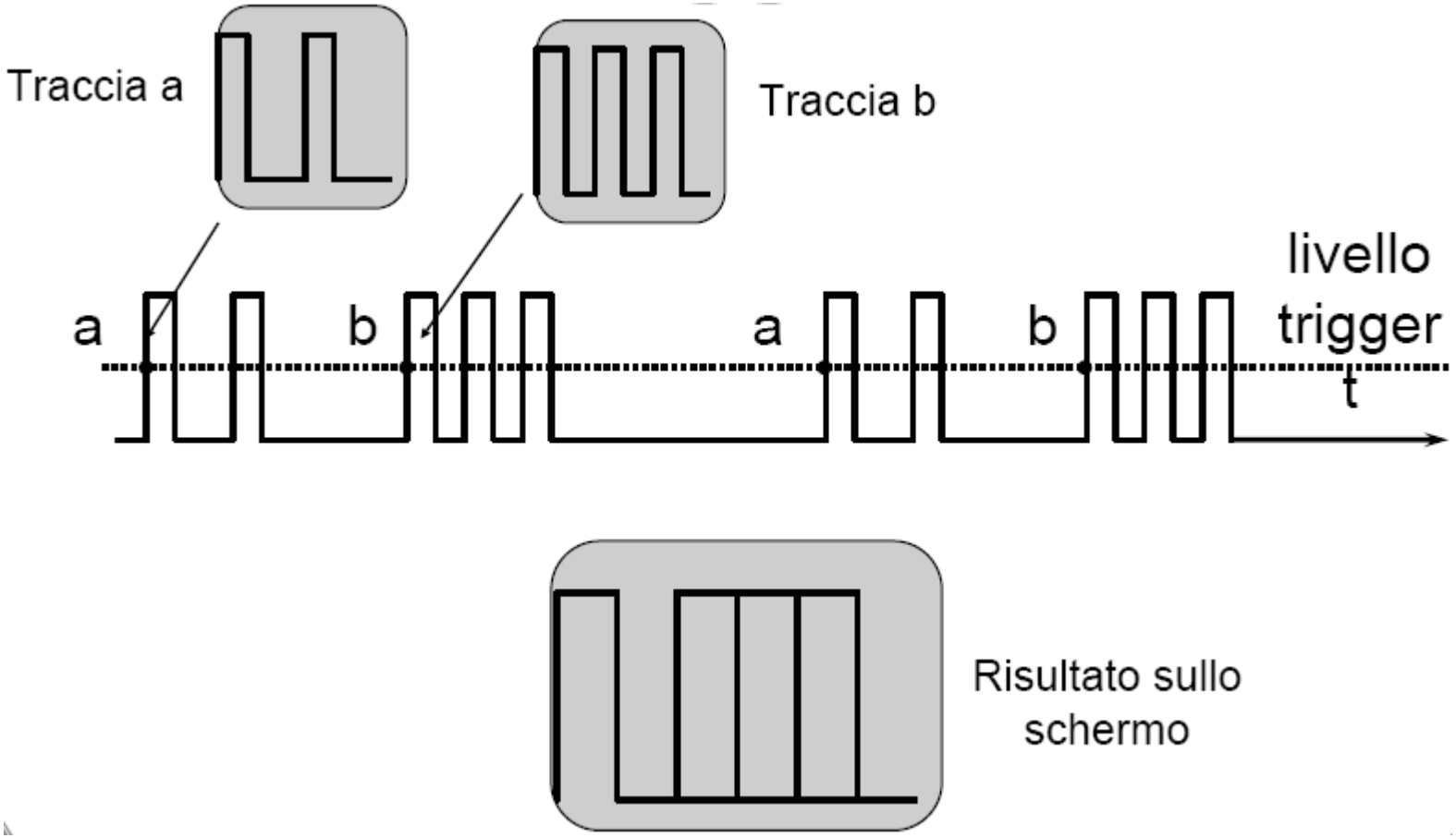
Il *Trigger*


y(t)
livello di trigger
canale
verticale
t
schermo
x(t)
base dei
tempi
t

Il *Trigger*

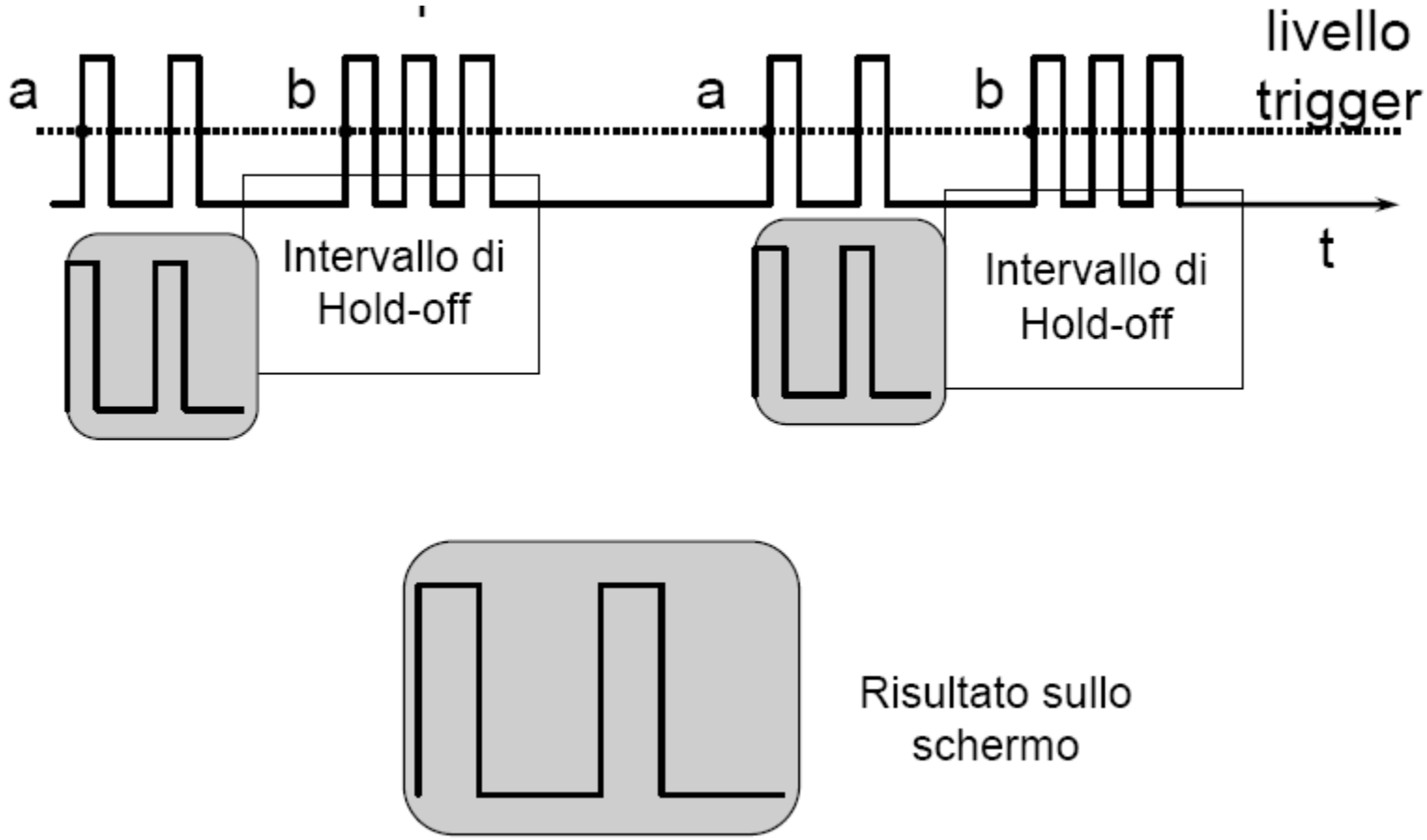


Segnali con punti di *trigger* multipli

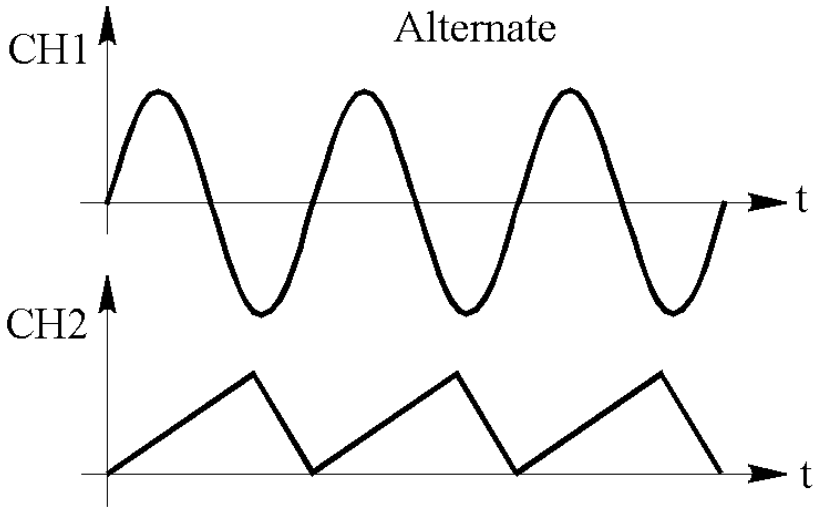


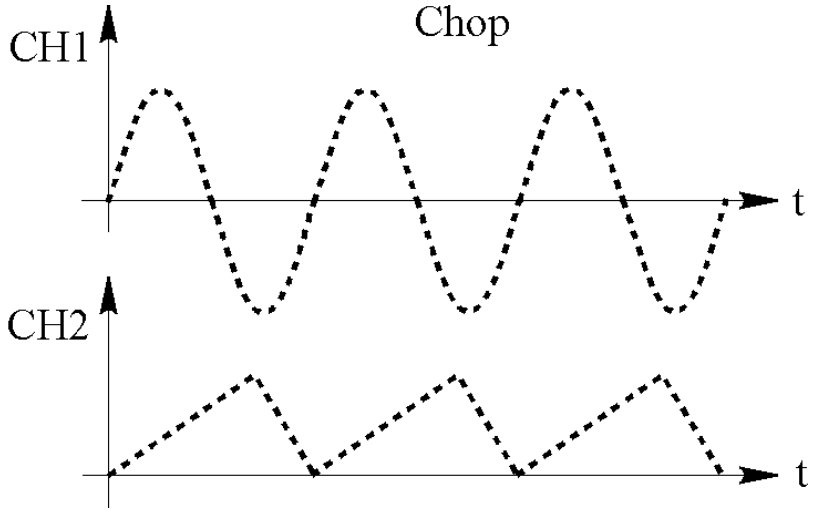
Segnali con punti di *trigger* multipli

Hold off



Sistema a due tracce

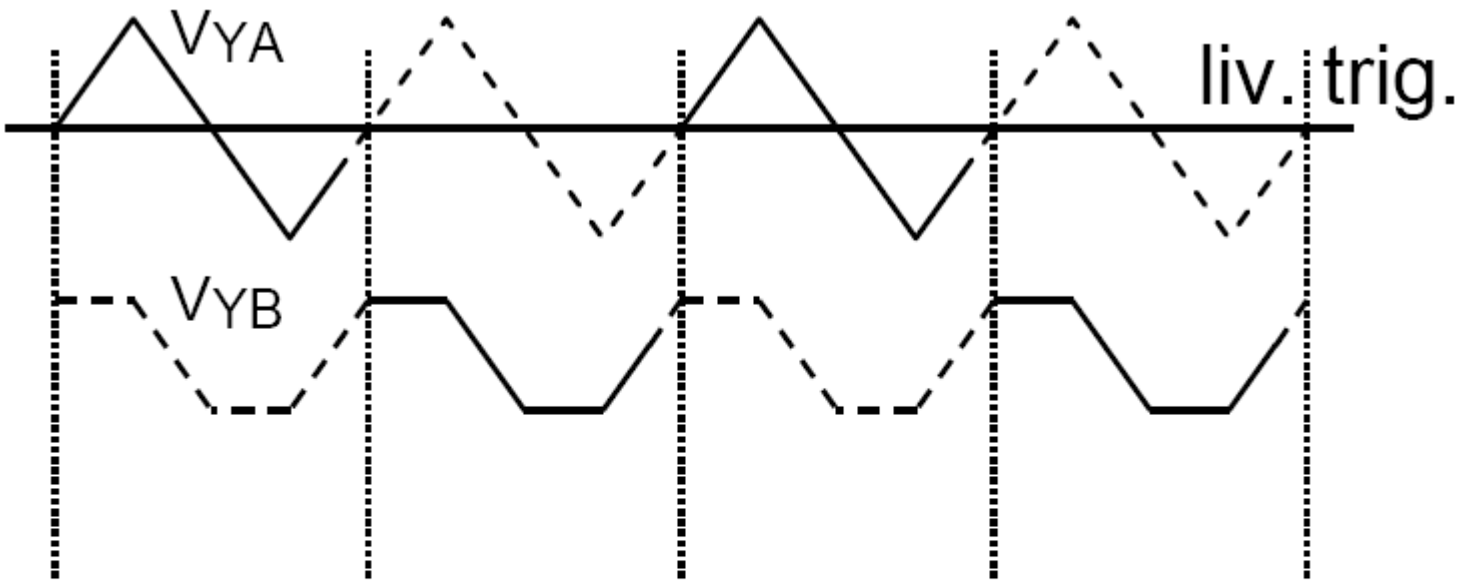


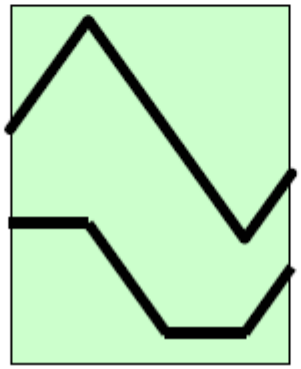


Sistema a due tracce

Modalità *alternate*

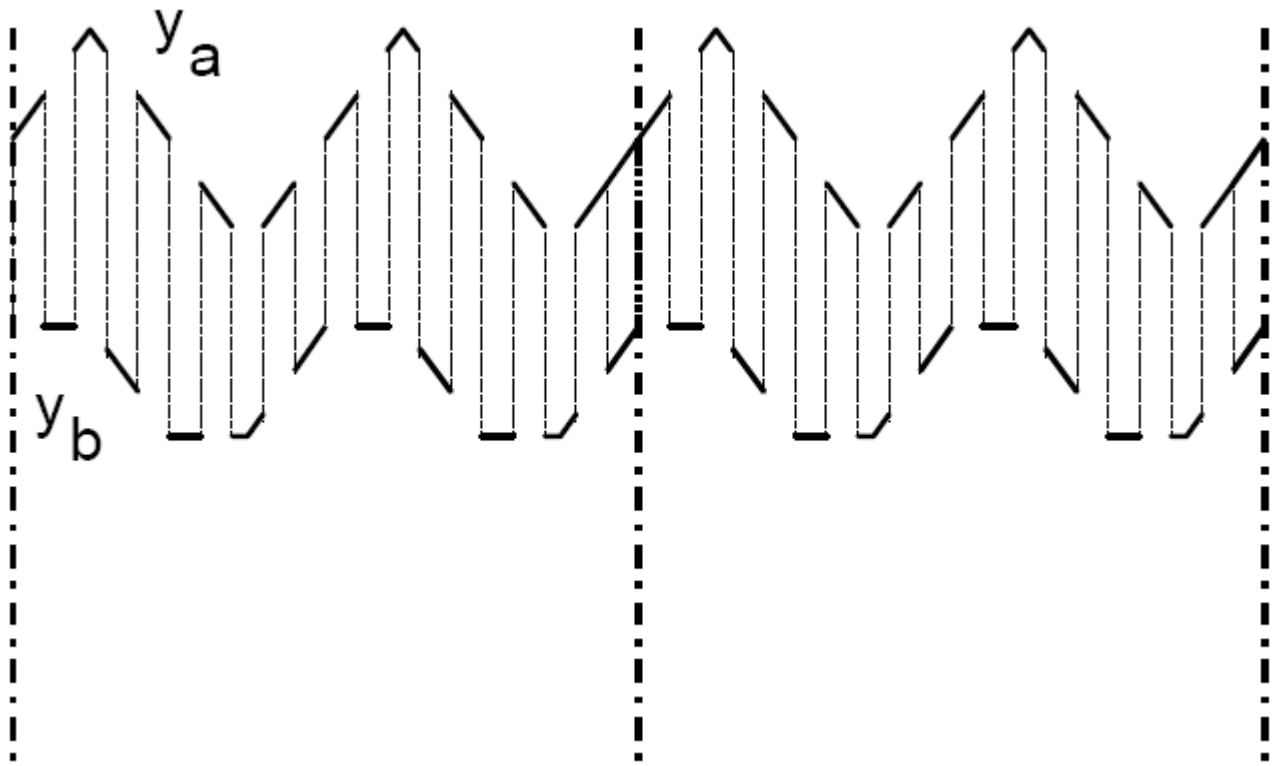
(con trigger su un canale)





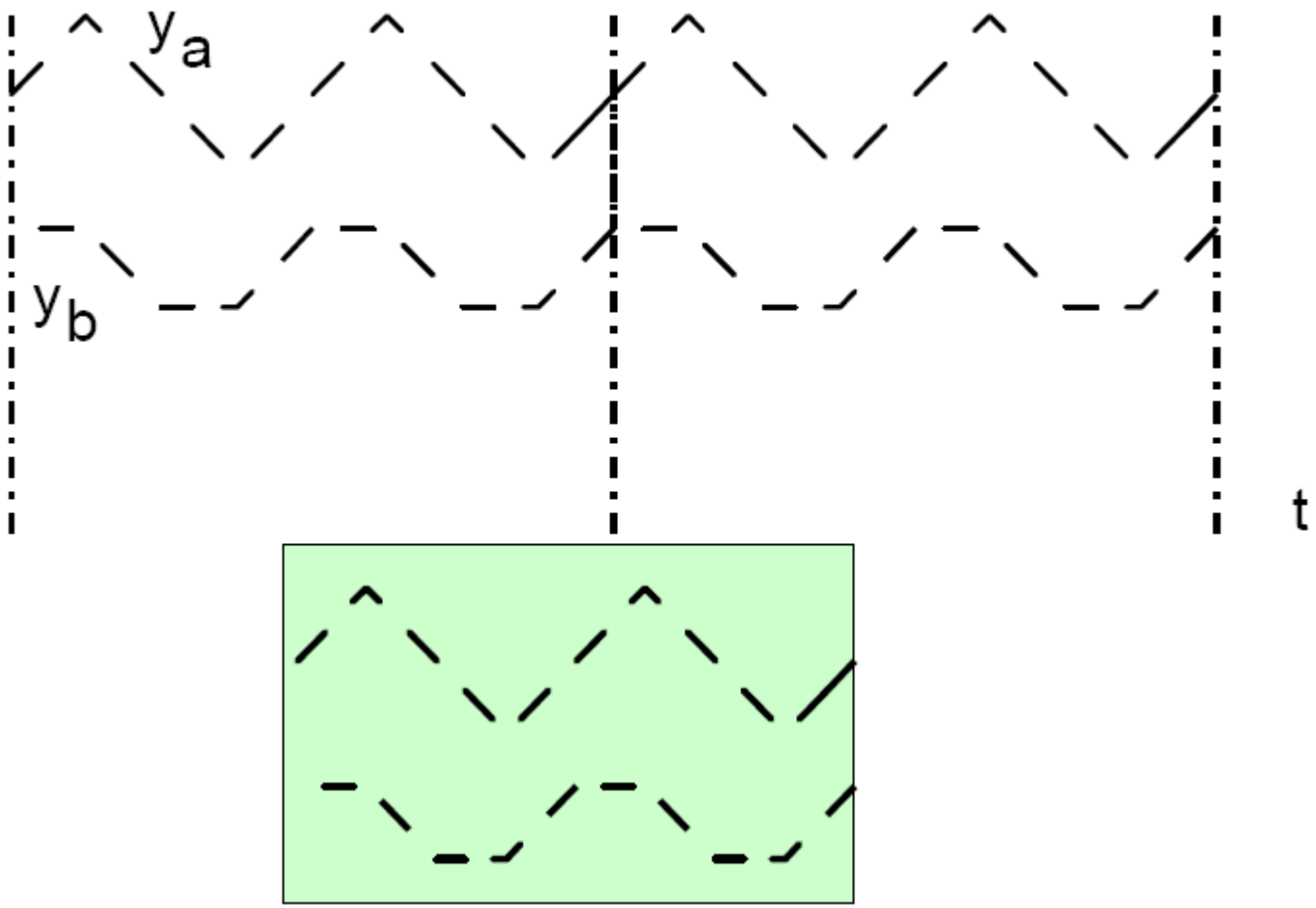
Sistema a due tracce

Modalità *chopped*



Sistema a due tracce

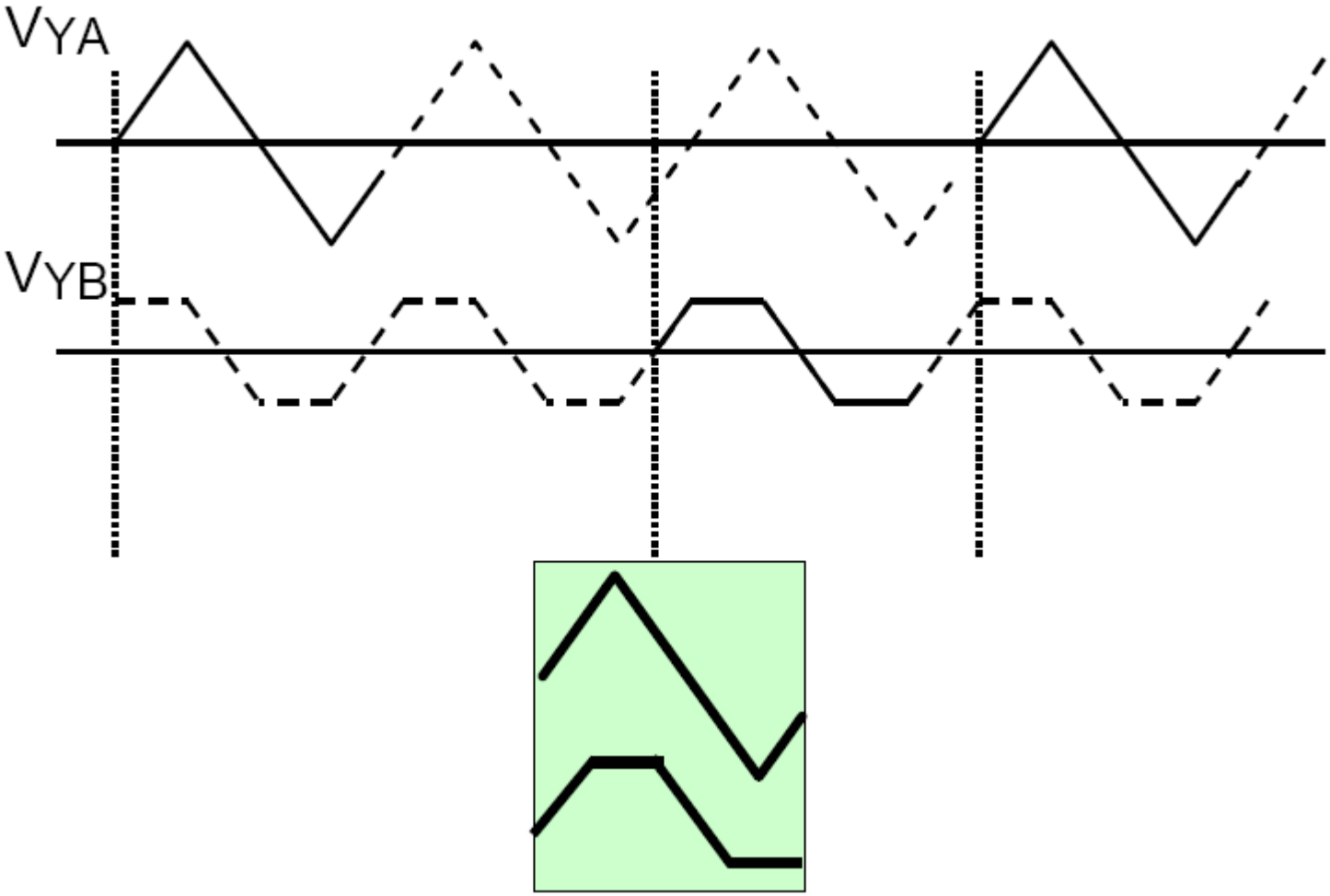
Modalità *chopped*



Sistema a due tracce

Modalità *alternate*

(con trigger alternato sui due canali)



Modalità *XY*