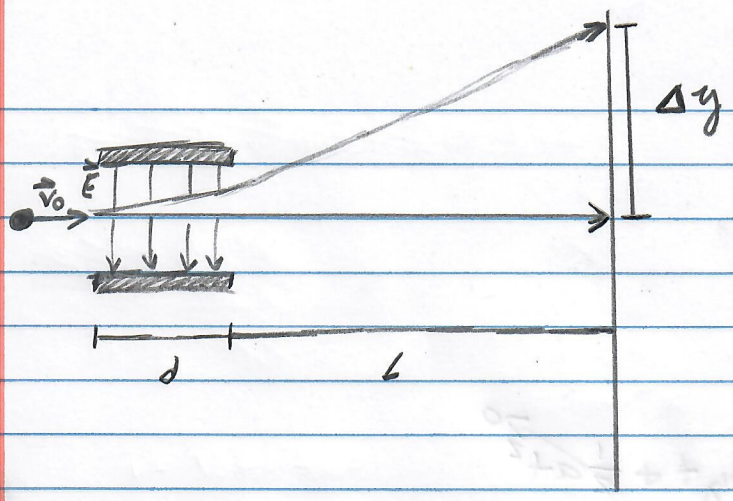

2 parts

1) Vertical Force / acceleration while traveling between the plates and through E

2) Constant Velocity V_y after the plates

V_{0x} remains constant

$$V = \frac{\Delta d}{\Delta t} \Rightarrow t = \frac{d+L}{V_0} \Rightarrow t = \frac{d}{V_0} + \frac{L}{V_0}$$

Stage 1 Stage 2

Stage 1

$$t = \frac{d}{V_0}$$

$$F = ma \Rightarrow \frac{F}{m} = a \Rightarrow a = \frac{qE_0}{m}$$

$$y = \cancel{y_0^{\,0}} + \cancel{V_{0y}^{\,0}}\,t + \frac{1}{2}at^2 \Rightarrow y = \frac{1}{2}\frac{qE_0}{m}\frac{d^2}{V_0^2}$$

$$V_y = \cancel{V_{0y}^{\,0}} + at \Rightarrow V_y = at \Rightarrow V_y = \frac{qE_0}{m}\frac{d}{V_0}$$

Stage 2

$t = \frac{L}{V_0}$

$a = 0$

$\Delta y = y_0 + V_{0y}t + \cancel{\frac{1}{2}at^2}^{0}$

$\Delta y = y_0 + V_{0y}t$

$\Delta y = \frac{qE_0d^2}{2mV_0^2} + \frac{qE_0d}{mV_0} \cdot \frac{L}{V_0}$

$\Delta y = \frac{qE_0d^2}{2mV_0^2} + \frac{qE_0dL}{mV_0^2}\left(\frac{2}{2}\right)$

$\Delta y = \frac{qE_0d^2 + 2qE_0dL}{2mV_0^2} = \boxed{\frac{qE_0d(d+2L)}{2mV_0^2}}$