Practical Work N°2: Free Fall

I. Objective of the experiment:

- Study of Uniformly Accelerated Motion and the Law of Free Fall.

- Set the acceleration of gravity g .

II. Theoretical principle:

The motion of each body that is subject only to its own weight is called free fall.
Let's consider a ball with a mass m that falls without an initial velocity V_0 from a certain height under the influence of its own gravity (neglecting air resistance) with h_0.

Applying Newton's second law to the mass: m

$$\sum \vec{F_i} = m\vec{\gamma}$$

$$mg = m\gamma \Leftrightarrow \gamma = g$$

(g= constant)

Hence, the movement of free fall is a regularly accelerated movement that gives the transition in terms of time as follows:

$$g = \frac{d^2h}{dt^2} \Leftrightarrow d^2h = gdt^2$$
$$\Leftrightarrow dh = gtdt$$
$$h(t) = \frac{1}{2}gt^2 (t = 0, h_0 = 0)$$

III. Experiment:

We install by Musayyib a conveyor ball **(m= … g**).
The counter begins to calculate the time from the moment the ball is released until it reaches the receiving sine to give the time (t) corresponding to the height (h) traveled by the ball.

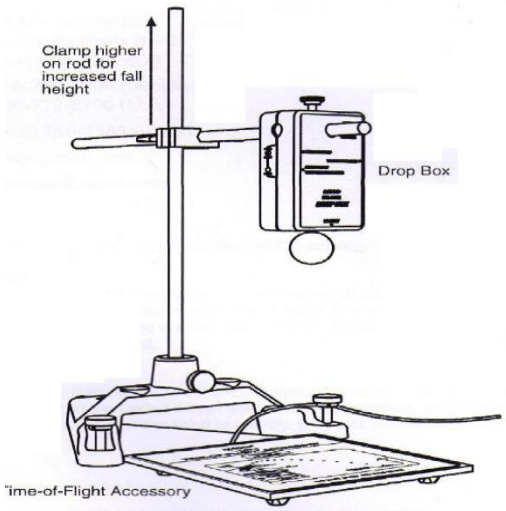

Figure 1: Drop box mounted on a rod stand

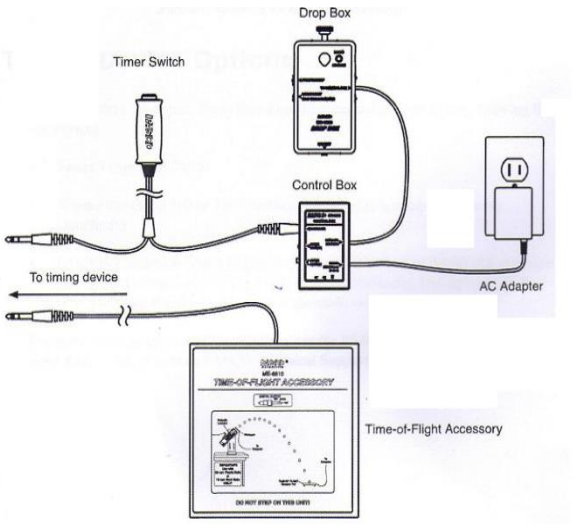

Figure 4: Equipment Set-up

h(m)	t_1(s)	t_2(s)	t_3(s)	t_m(s)	$t^2(s^2)$	$g(m/s^2)$	$\Delta g(m/s^2)$
0.2							
0.3							
0.4							
0.5							
0.6							
0.7							
0.8							