

## The Period of a Recording Timer

Problem: What are the period and frequency of the recording timer?

Materials: recording timer   two 1 m pieces of ticker tape   carbon paper disc   stopwatch

Procedure:

1. Follow instructions for setting up the timer. Ensure the carbon side of the disc is up.
2. Thread one end of the paper tape into the timer, over the carbon paper disc.
3. One person is the timer while the other is the puller. The puller must be careful to pull the tape at a steady rate (keep it moving). The puller says "start" when they start pulling the tape and the timer starts timing. When the puller is done they say "stop" and the timer stops. Repeat this again exchanging jobs.
4. Record data in the data table.

Observations:

Time (s)	Number of dots

Calculations: (show the equation, sub in your values, and give the answer with the correct unit)

Frequency	Period

Questions:

1. What would happen if the tape was pulled too slowly?
  
  
  
  
  
  
  
  
  
  
2. Does it matter if the dots are unevenly spaced along the tape? What would this indicate?

3. The period of the recording timer is  $1/60$  s or 0.017 s. Calculate the percent error in your measurement.

$$\text{Percentage error} = \frac{\text{measured value} - \text{accepted value}}{\text{accepted value}} \times 100 \%$$

4. What are the major sources of error that could affect your measurements and your calculation of the period? How could you allow for each of these sources of error, so as to obtain a more accurate value for the period?

**Conclusion:**

This is where you give the best answer for the problem posed at the start of the lab (including the percentage error).

**Follow-Up Problems: Remember, no work, no marks!**

1. A recording timer makes 540 dots in 4.0 s. What is its period? (0.0074 s)
  
  
  
  
  
  
  
  
  
  
2. A recording timer has a period of 0.025 s. How many dots does it make in 0.80 s? (32dots)
  
  
  
  
  
  
  
  
  
  
3. A recording timer has a period of 0.04 s. How many dots does it make in 0.20 s? (5 dots)