Experiment – 3

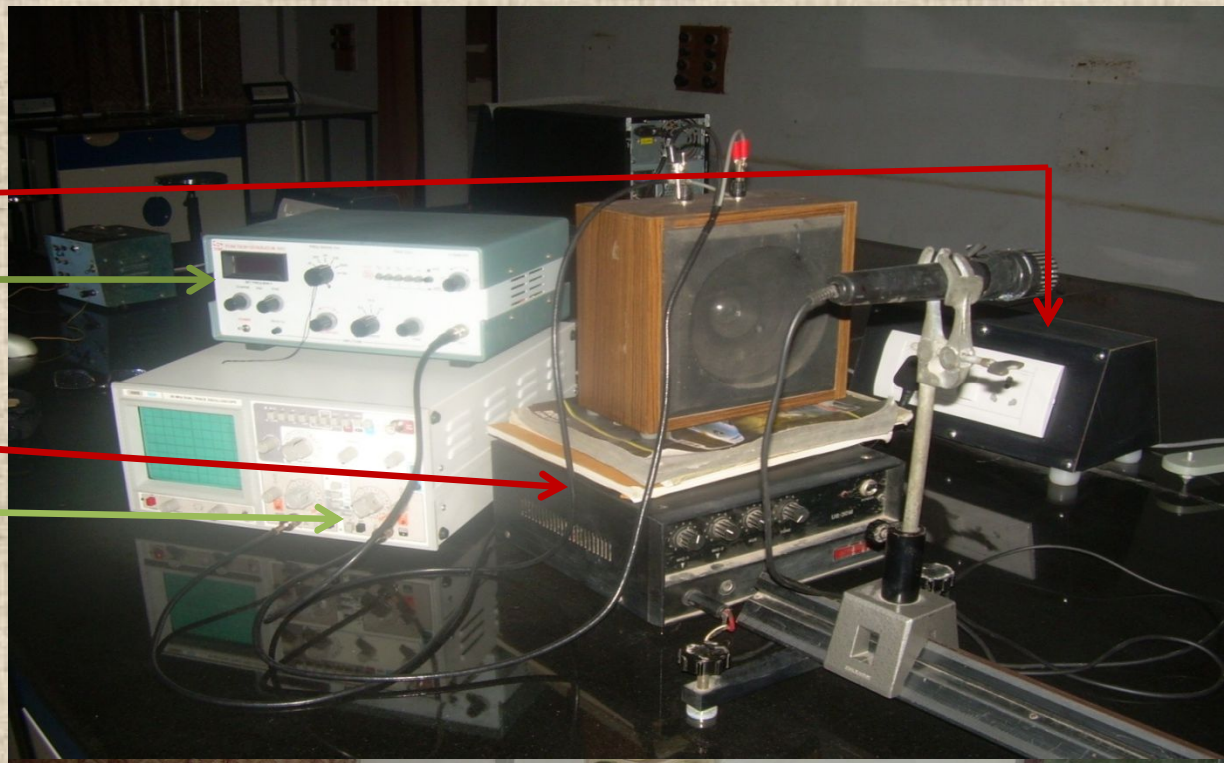
Part-I : To Determine the Velocity of Sound

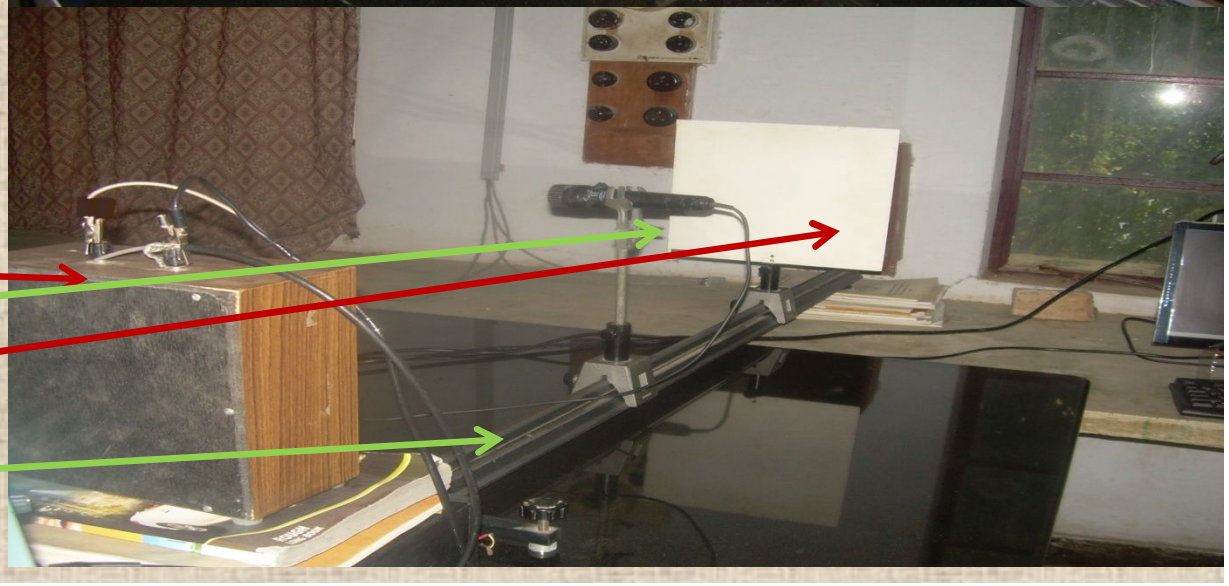
Note : *This document is not an alternate to lab manual. You must read the lab manual first and then go through this document.*

APPARATUS USED TO MEASURE THE VELOCITY OF SOUND

- Power Supply
- Audio Frequency Generator
- Amplifier
- CRO

(Read the lab manual for details)





- Speaker
- Microphone
- Reflector
- Meter Scale

Connect all components as shown below
(see the text below and read the lab manual for details)

1. Power Supply to CRO, Audio Frequency Generator (AFG) and Amplifier

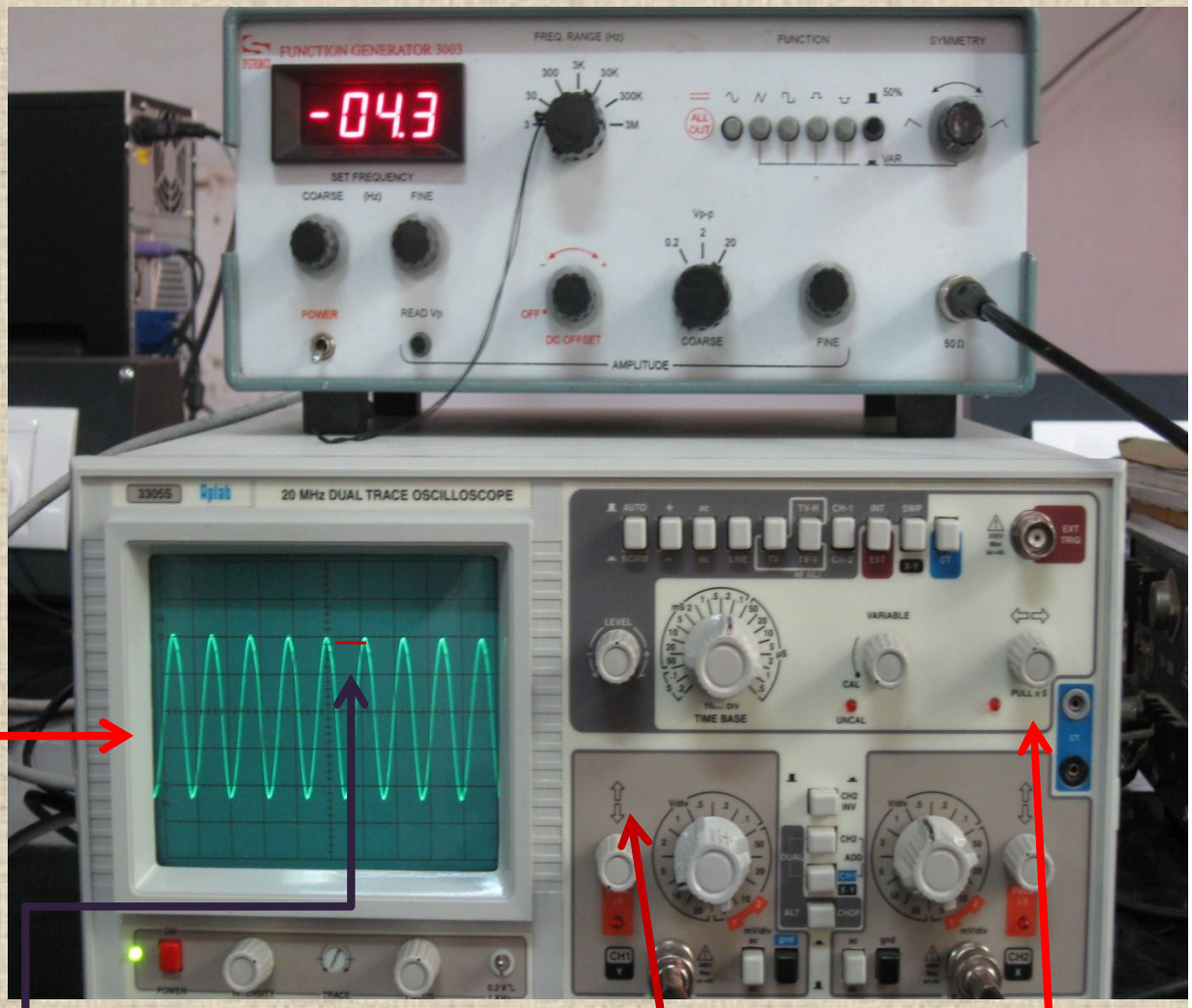
2. AFG to CRO and Speaker

3. CRO to Amplifier

4. Amplifier to Speaker

Adjusting Sinusoidal Trace on CRO

If all the connections done properly, you should get on CRO stationary sinusoidal trace



Read the consecutive maximum of the trace (7 div. in this presentation)

The position of sinusoidal trace can be adjusted by horizontal & vertical deflection system

Reading the audio frequency from CRO

- Read the scale

(0.2 ms in this demonstration)

5 div. = 0.2 ms

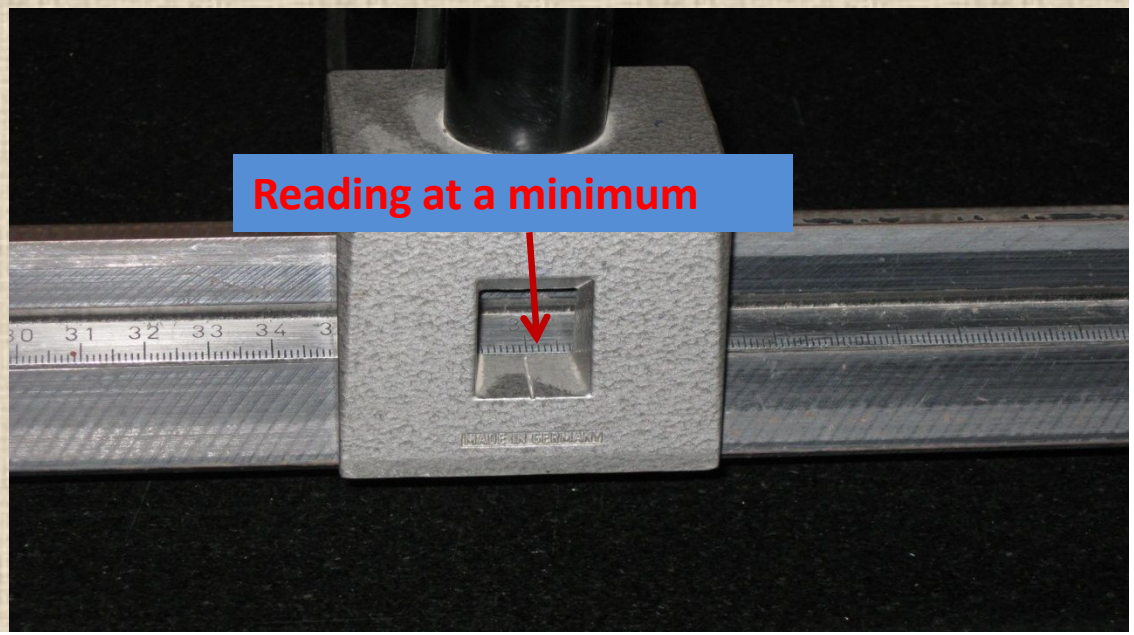
1 div. = 0.04 ms

7 div = 0.28 ms

- The Frequency of the signal : 357.14 kHz

Obtaining Successive Minima/Maxima

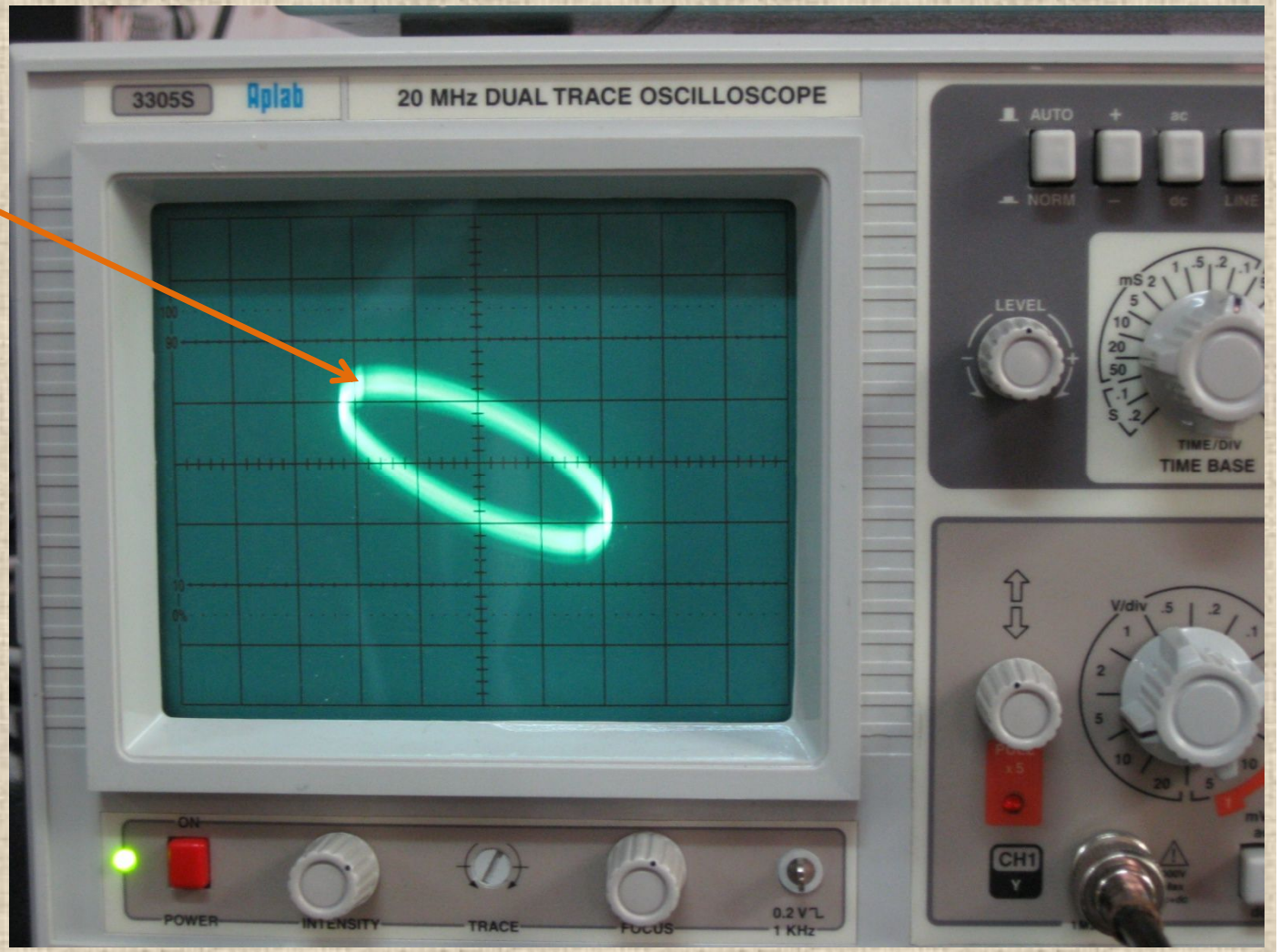
- See the change of the amplitude of the signal By moving the Mic. away from the reflector
- Note down the reading of successive minima (see the figure)



Lissajuous Pattern

To obtain the Lissajuous Pattern :

- Set the Trigger source for the oscilloscope to the X-Y trigger.
- Connect the output of the speaker to the x-channel.



Experiment – 3

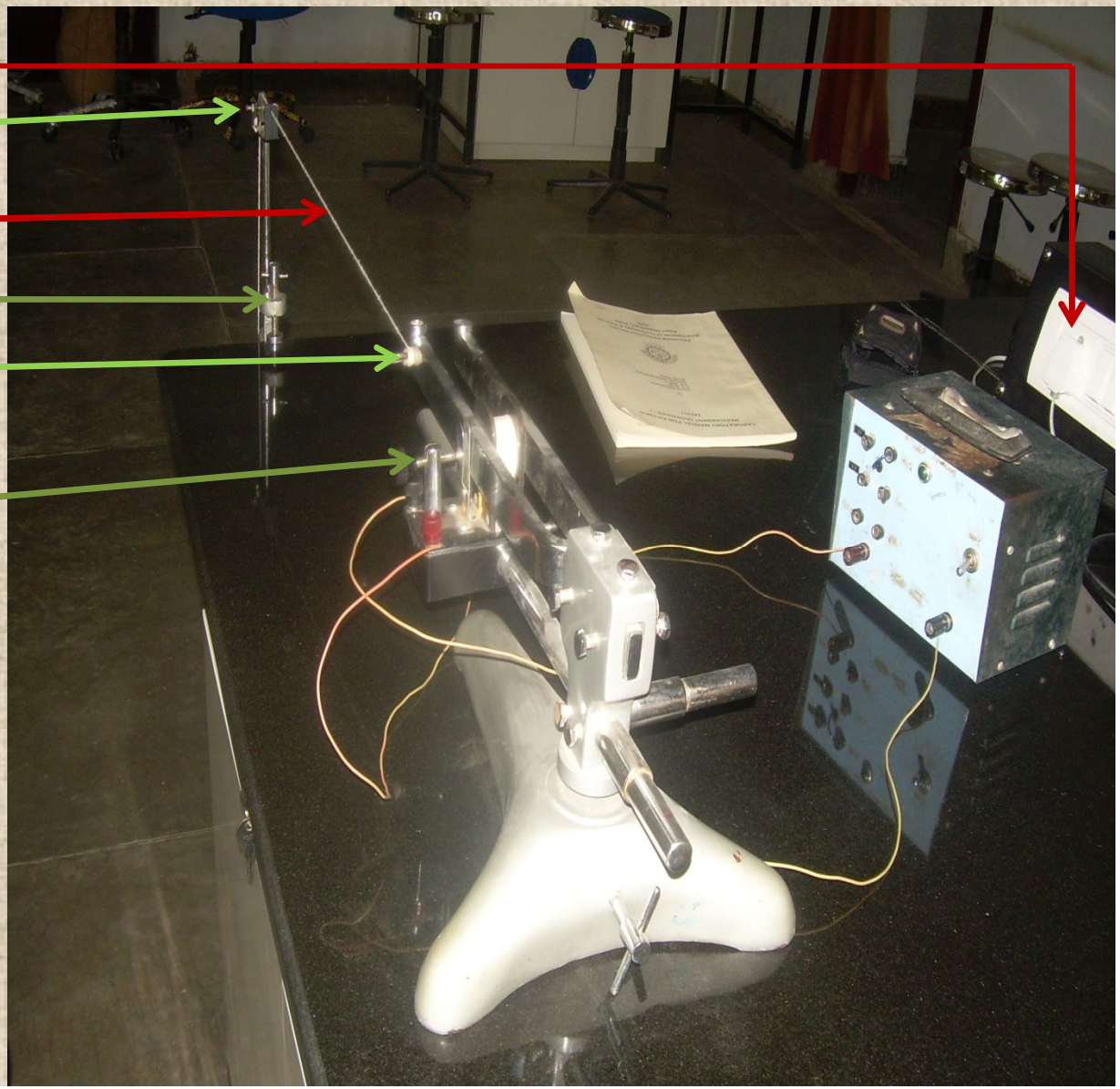
PART-II : Vibrating String

(To study the normal modes of vibrating string and hence determine the frequency of a Tuning Fork)

Note : *This document is not an alternate to lab manual. You must read the lab manual first and then go through this document.*

APPARATUS USED TO OBSERVE NORMAL MODES OF VIBRATION OF A STRETCH STRING AND TO DETERMINE THE FREQUENCY OF A TUNING FORK

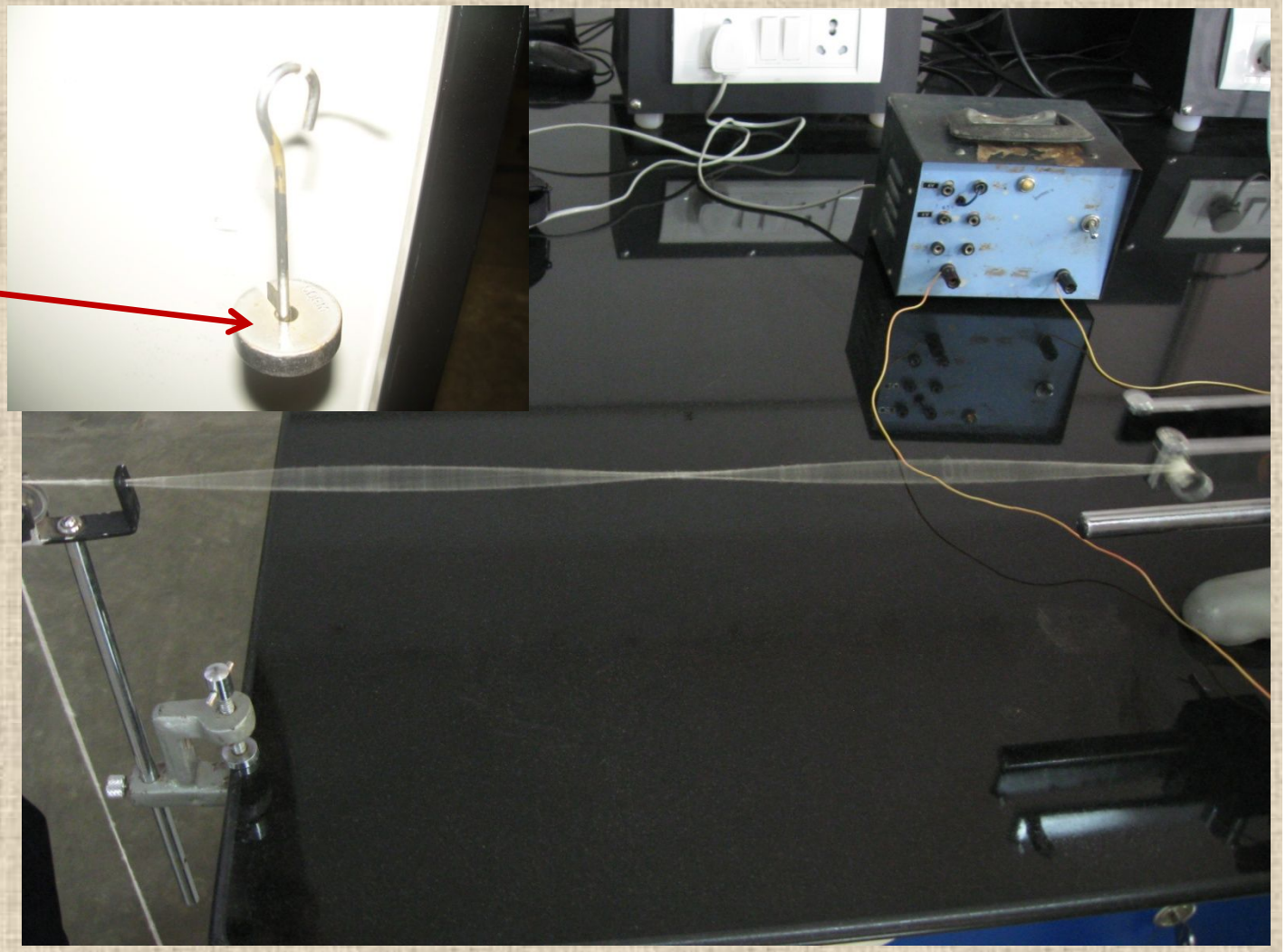
- DC Power Supply
- Pulley
- String
- Peg & Weight
- Tuning Fork
- Electrically Driven Oscillator



Procedure

Obtaining normal modes:

- Put weight on the peg
- Switch on the power supply
- Note the vibration of the string
- Move the stand toward pulley
- Observe the normal mode (s)



(**Note :** The freq. of the tuning fork can be determined from the observation of the normal modes. Read the lab manual for details.)