Metal Resonance Strips

P7-1500-05

INSTRUCTIONAL GUIDE

Contents

- 3 resonance strips on banana plug connector
- Instructional Guide

Recommended for activities:

- Sine Wave Generator (P7-2000)
- Mechanical Wave Driver (P7-1000)

Background

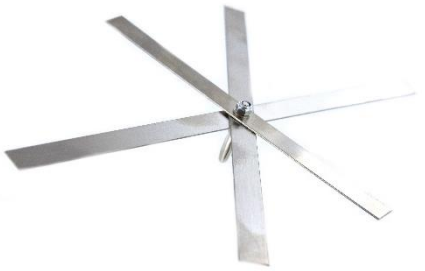
Resonance is the condition in which energy is transmitted between two oscillating objects. Resonance occurs when one is the driving force and its frequency is varied until it matches a natural frequency of the other oscillating object. The metal strips in this apparatus have natural frequencies of oscillation related to their length.

Introduction

A time-dependent driving force is provided by the Mechanical Wave Driver. When the frequency of the wave driver matches a natural frequency of the metal strips, a standing wave pattern will form in the metal strips. Since the length of the standing waves must be matched to the length of the metal strips, resonance will occur at different frequency for different length strips. While one strip resonates with large amplitudes, the other metal strips will appear almost motionless. The nodes and antinodes along the resonating strip are clearly apparent and their wavelengths can be measured.

Set-Up

1. Rotate the metal strips so that they are at equal angles from each other.
2. Insert the banana plug of the metal strip into the driver shaft of the Mechanical Wave Driver.
3. Connect the Mechanical Wave Driver to the sine wave generator using two banana plug cables.



Activity

With the amplitude of the Sine Wave generator turned low, start with a low frequency of about 5 Hz output from the function generator to the wave driver. Increase the amplitude, and gradually increase the frequency until resonance occurs in the longest strip. Continuing to increase the frequency will establish resonance with the shorter strips.

Related Products

Resonance Wire Loop (P7-1500-02) Introduce Bohr's quantum atom using a classic model. The resonance wire loop demonstrates standing wave patterns when vibrated at resonant frequencies.

Transverse Wave String (P7-1500-03) This Wave string is ideal for demonstrating standing waves. Typical experiments such as the resonant frequencies of taut vibrating string can be performed with additional parts.

Chladni Plates Kit (P7-1500-04) The first step to Visualize Acoustics! At special frequencies, standing waves appear on the plate, driving the sand away from the points of large vibration to points of no vibrations.