



## Instructional Guide

# Mechanical Wave Driver

Part# P7-1000

### Contents:

- 1 ea. Wave Driver
- 2 ea. Banana Plugs

### Introduction to the Apparatus

The Mechanical Wave Driver is a heavy duty long-throw speaker that can vibrate with variable amplitude and frequency. Attached to the middle of the speaker cone is a metal drive shaft, which can be used to drive a wide variety of wave and resonance experiments. You will need a function generator or sine wave generator producing a current of up to 1 ampere in conjunction with the wave driver.

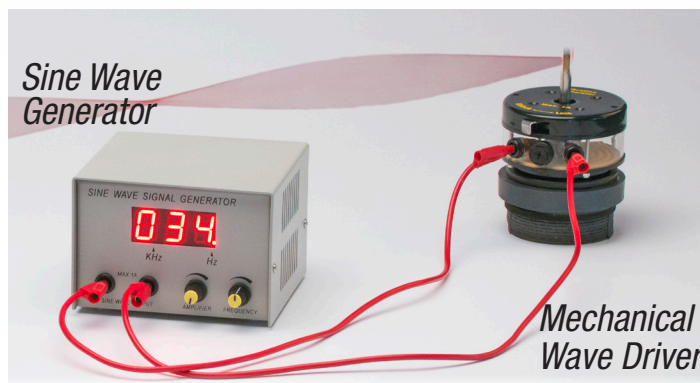
### Setup Procedure

Set up the apparatus following the steps outlined below.

1. Start by locking the drive shaft, by sliding the drive shaft locking lever to the Lock position. This protects the speaker as you connect or disconnect the drive shaft to other apparatus. (Remember to unlock the drive shaft when running your experiments.)



2. After connecting a banana plug holder to your experiment, insert a banana plug, such as the Slotted String Holder, into the end of the drive shaft
3. Unlock the drive shaft locking arm.
4. Connect the output from your function generator using banana plug patch cords into the wave driver.



5. Using the output knobs on the sine wave generator, adjust the frequency and amplitude to produce mechanical vibrations to drive your experiments.

# Sine Wave Generator

Part# P7-2000

### Contents:

- 1 ea. Wave Generator

### Introduction to the Apparatus

The Sine Wave Generator is an excellent tool for generating waves with speakers or our mechanical wave driver (see above). It allows both the frequency (1-400 Hz / 1 Hz resolution; 10 – 4000 Hz / 10 Hz) and amplitude of the sine wave output to be varied. Students can observe the quantum nature of standing wave patterns as the Sine Wave Generator jumps from one resonant frequency to the next.

# Suggested Uses

Standing Wave Demonstrations

## Transverse Wave String P7-1500-03

Dramatic node and antinode patterns that make it easy to measure the wavelength and speed of the waves.



## Resonance Wire Loop P7-1500-02

Produce standing waves on a wire loop to explain the atomic model's electron orbitals.



## Longitudinal Wave Spring P7-1500-01

Demonstrates longitudinal standing waves on a stretched spring.



## Metal Resonance Strips P7-1500-05

Demonstrate the principle of resonance between the frequency of the driver and the standing waves that form on different length metal strips.



## Chladni Plates P7-1500-04

Vibrate the plates and observe the standing wave patterns. Sand collects in the nodal regions and forms sharply distinct lines of destructive interference against the black metal.



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## Trouble Shooting:

Check the fuse located on the side of the driver. If the fuse is “blown”, replace it with a similar fuse rated at 1.0 A, 250 V. If the fuse fails again, be sure the output current of the function generator is limited to 1.0 A.