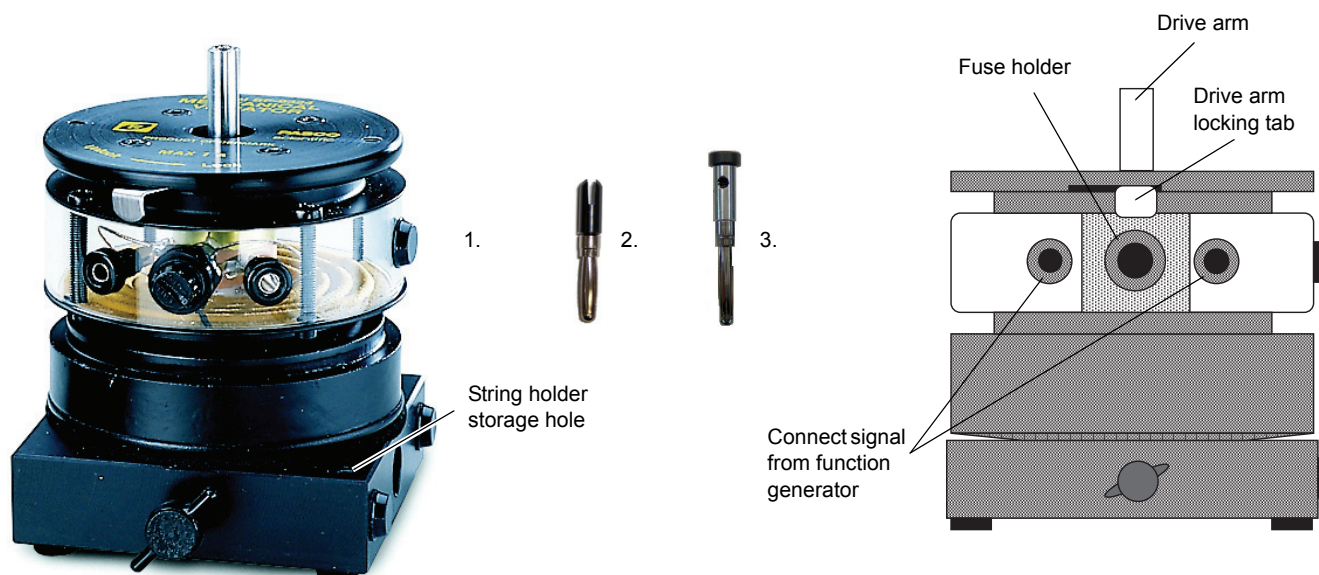




PASCO Waves and Sound Mechanical Wave Driver

SF-9324



Included Equipment

1. Mechanical Wave Driver, SF-9324
 2. Slotted String Holder with Plug (1)
 3. String Holder with Plug (1)
- Elastic cord (not shown)
 - Extra fuses (not shown)

Replacement Parts

- Slotted String Holder with Plug (4), SF-9322
- String Holder with Plug (4), SF-9323

Required Equipment

- Banana Plug Patch Cords (SE-9751)

and one of the following function generators

- Sine Wave Generator (WA-9867)
- Function Generator (PI-8127)

or

- Power Amplifier II (CI-6552A) with
- ScienceWorkshop 750 Interface (CI-7650)

or

- Xplorer GLX Power Amplifier (PS-2006) with
- Xplorer GLX Datalogger (PS-2002)

Introduction

The Mechanical Wave Driver lets you drive wave experiments with ease and accuracy. You will need a function generator* with an amplifier capable of producing current up to 1 ampere. (The PASCO WA-9867 Sine Wave Generator and the PASCO PI-8127 Function Generator are recommended.)

** See the PASCO catalog or web site at www.pasco.com for more information.*

The Mechanical Wave Driver is a strong, long-throw speaker, with an attached drive arm. The top of the drive arm has a 4 millimeter diameter hole for plugging in the included connectors. The speaker will vibrate at any frequency from 0.1 Hz to 5 kilohertz (kHz) and with amplitudes up to 7 millimeters (mm) peak-to-peak at the low end of the frequency range. The waveform need not be a sine wave; other waveforms such as square, triangle, or sawtooth can be used.

You can attach a wire or string to the Mechanical Wave Driver using one of the included connectors (String Holder with Plug or Slotted String Holder with Plug.) Of course, you can design your own connector: one method is to solder a piece of stiff wire to a banana plug connector and then bend the wire as needed.

The Mechanical Wave Driver is designed to sit upright or on its side (rest it on the side with the rubber feet). It can also be mounted on a rod up to 12 mm (1/2") in diameter in either a vertical or horizontal position. See Figure 1.

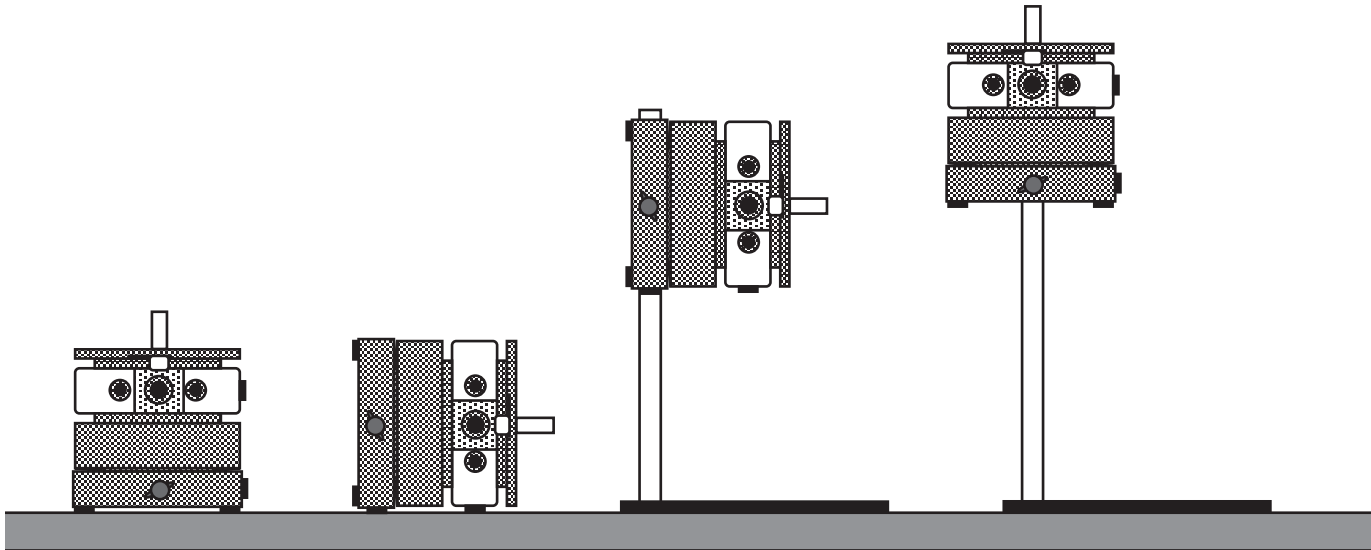


Figure 1: Mounting the Mechanical Wave Driver

IMPORTANT: When connecting the drive arm to other apparatus, or when storing the Mechanical Wave Driver, always lock the drive arm first by sliding the drive arm locking tab at the top of the driver to the Lock position.

Driver Won't Run?

If at any time the Mechanical Wave Driver fails to work, follow these steps:

1. Check the fuse. If the fuse is "blown", replace it with a similarly rated fuse: 1.0 A, 250 V. When replacing the fuse, be sure that the fuse holder is fully tightened.
2. If the fuse is not "blown", check that the fuse holder is fully tightened. If it is not screwed in all the way, power may not be able to get to the unit even if the fuse is good.

Operation

1. Lock the drive arm by sliding the drive arm locking tab to the Lock position. (This protects the speaker as you connect the drive arm to a string or to other apparatus.)
 2. Connect the drive arm to the string or experimental apparatus.
- **NOTE:** Avoid putting a sideways force on the drive arm. If you are driving a wire or string that has tension, attach the end of the wire or string to a support rod as shown in Figure 2..

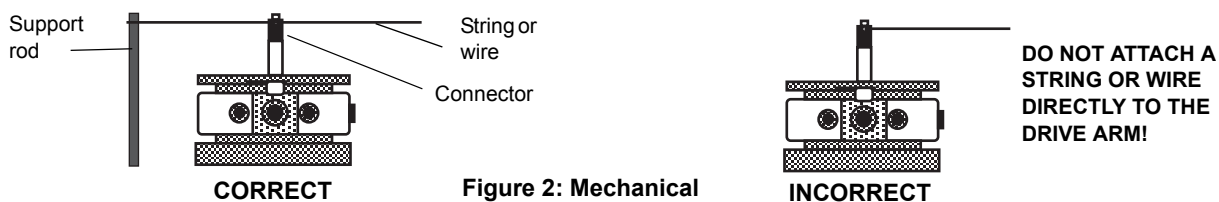


Figure 2: Mechanical Wave Driver

3. Unlock the drive arm locking tab.
4. Plug the output from your function generator into the banana plug receptacles on the front of the driver.
5. Adjust the frequency and amplitude of the function generator to produce mechanical waves with the frequency and amplitude you want. The current should not exceed 1 ampere.

Suggested Uses

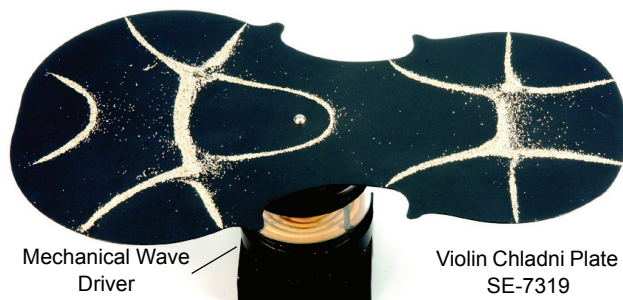
Wave Demonstrators Use the Mechanical Wave Driver to drive a wave demonstrator such as the SE-9600 Transverse Wave Demonstrator or the SE-9604 Longitudinal Wave Demonstrator.

Wave on a Wire or String Use the driver to produce waves in a stretched wire or string. Determine the resonant frequencies as a function of length, or examine the relationship between wave velocity and the tension and mass per unit length of the string or wire.

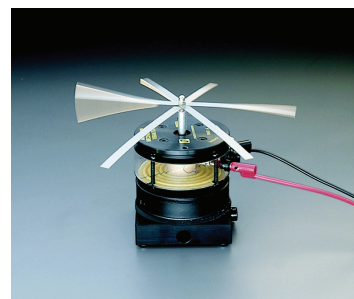


Driven Harmonic Motion Drive a mass hanging on a spring and compare the amplitude of the oscillations with the drive frequency. Use the String Holder with Plug to attach the spring to the drive arm. Resonant modes of coupled oscillators can be studied using air track gliders or carts on a track coupled by springs.

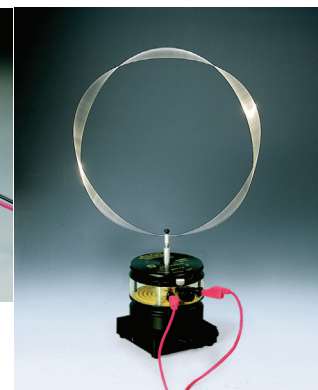
Chladni Plates Use the driver to vibrate sheets of metal and observe the standing wave patterns that are formed at resonant frequencies.



Resonant Loops and Strips Use the driver to vibrate a resonant loop to show standing waves on a wire and vibrate resonant strips to demonstrate standing waves, harmonics, and the relationship between length, frequency, and resonance.



Metal Resonance Strips
SF-9404



Resonance Wire Loop
SF-9405

Molecular Motion Use the driver with the Molecular Motion Model (SF-8563) to demonstrate the kinetic theory of gases.



Molecular Motion Model
SF-8563

Specifications

Frequency Range	0.1 Hz to 5.0 kHz
Amplitude (peak-to-peak)	7 mm at 1 Hz*
Input Impedance	8 ohms
Maximum Current	1 ampere (fuse limited)
Nominal Current Required	<0.25 A
Maximum Input	6 V at 0.8 A

*Decreasing with increasing frequency

Technical Support

For assistance with any PASCO product, contact PASCO at:

Address: PASCO scientific
10101 Foothills Blvd.
Roseville, CA 95747-7100

Phone: 916-786-3800 (worldwide)
800-772-8700 (U.S.)

Fax: (916) 786-7565

Web: www.pasco.com

Email: support@pasco.com

For more information about the Mechanical Wave Driver and the latest revision of this Instruction Sheet, visit:

www.pasco.com/go/SF-9324

Limited Warranty For a description of the product warranty, see the PASCO catalog. **Copyright** The PASCO scientific 012-03177H *Mechanical Wave Driver Instruction Sheet* reserved. Permission is granted to non-profit educational institutions for reproduction of any part of this manual, providing the reproductions are used only in their laboratories and classrooms, and are not sold for profit. Reproduction under any other circumstances, without the written consent of PASCO scientific, is prohibited. **Trademarks** and PASCO scientific are trademarks or registered trademarks of PASCO scientific, in the United States and/or in other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of, their respective owners. For more information visit www.pasco.com/legal.