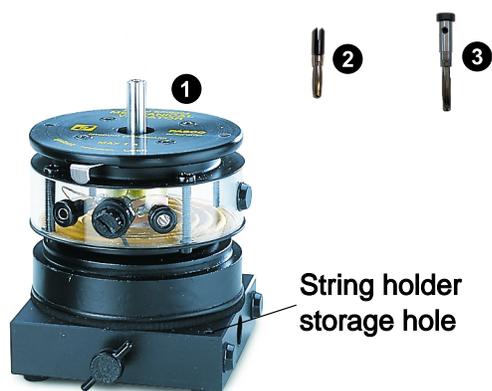


# Mechanical Wave Driver (SF-9324)



## Included Equipment

- ❶ Mechanical Wave Driver (SF-9324)
- ❷ Slotted String Holder with Plug (1)
- ❸ String Holder with Plug (1)
- ❹ Elastic cord (not shown)
- ❺ Extra fuses (not shown)

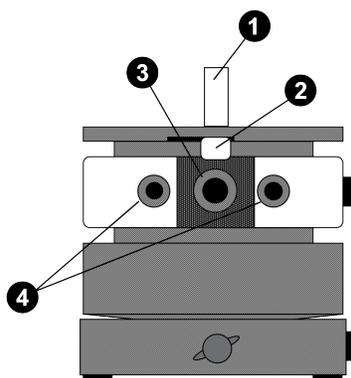
## Replacement Parts

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

## Required Equipment

- Banana Plug Patch Cords (SE-9751)
- One of the following function generators:
  - Sine Wave Generator (WA-9867)
  - Function Generator (PI-8127)
  - 850 Universal Interface (UI-5000)

## Components



- ❶ Drive arm
- ❷ Drive arm locking tab
- ❸ Fuse holder
- ❹ Banana plug receptacles

## Introduction

The Mechanical Wave Driver is a strong, long-throw speaker with an attached drive arm. The top of the drive arm has a 4 mm diameter hole for plugging in the included connectors. The speaker will vibrate at any frequency from 0.1 Hz to 5 kHz, and with amplitudes up to 7 mm peak-to-peak at the low end of the frequency range.

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, the PI-8127 Function Generator, and the UI-5000 850 Universal Interface are recommended.) 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). You can also design your own connector if desired; one method for this 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) in diameter in either a vertical or horizontal position. (See Figure 1.) A horizontal crossbeam can also be used to mount the driver upside-down, with the driver arm facing the ground.

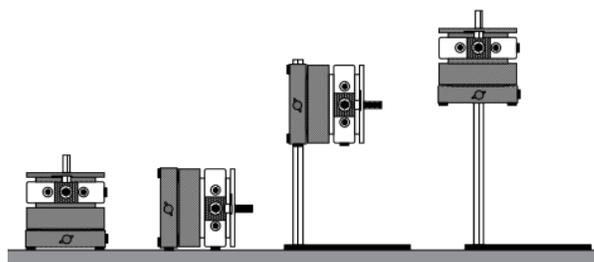


Figure 1. Mounting the Mechanical Wave Driver



**IMPORTANT:** When connecting the drive arm to another 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.

## Troubleshooting the Driver

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 in working condition.

## 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 the string or 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.

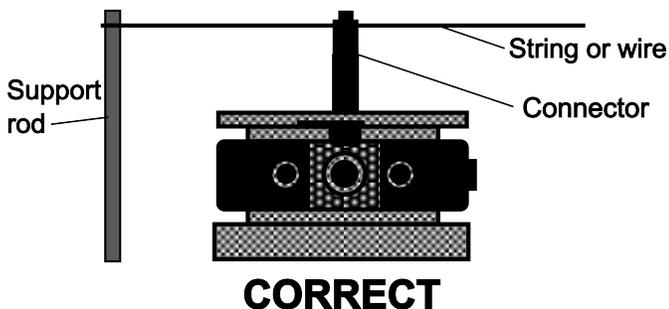
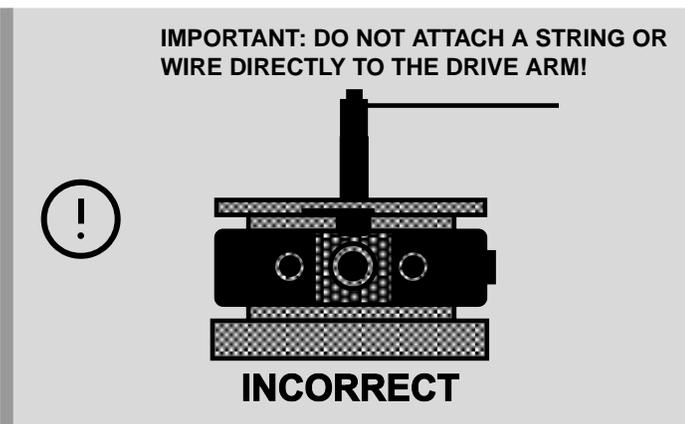


Figure 2. Mechanical Wave Driver



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 desired frequency and amplitude. **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.

### 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 Longitudinal Wave Spring (WA-9401) and compare the amplitude of the oscillations with the drive frequency. To set up this experiment, mount the wave driver on a horizontal rod with the drive arm facing downward, then 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.

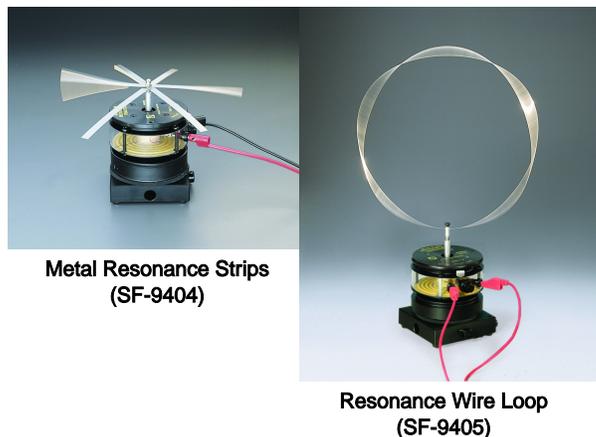
### Chladni Plates

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. You can also vibrate resonant strips to demonstrate standing waves, harmonics, and the relationship between length, frequency, and resonance.



## Specifications and accessories

Visit the product page at [pasco.com/product/SF-9324](https://www.pasco.com/product/SF-9324) to view the specifications and explore accessories. You can also download support documents from the product page.

## Technical Support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

-  Chat [pasco.com](https://www.pasco.com)
-  Phone 1-800-772-8700 x1004 (USA)  
+1 916 462 8384 (outside USA)
-  Email [support@pasco.com](mailto:support@pasco.com)

## Regulatory Information

### Limited Warranty

For a description of the product warranty, see the Warranty and Returns page at [www.pasco.com/legal](https://www.pasco.com/legal).

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### Product end-of-life disposal



*This electronic product is subject to disposal and recycling regulations that vary by country and region.*

*It is your responsibility to recycle your electronic equipment per your local environmental laws and regulations to ensure that it will be recycled in a manner that protects human health and the environment.*

*To find out where you can drop off your waste equipment for recycling, please contact your local waste recycle or disposal service, or the place where you purchased the product.*

*The European Union WEEE (Waste Electronic and Electrical Equipment) symbol on the product or its packaging indicates that this product must not be disposed of in a standard waste container.*

### CE statement

This device has been tested and found to comply with the essential requirements and other relevant provisions of the applicable EU Directives.