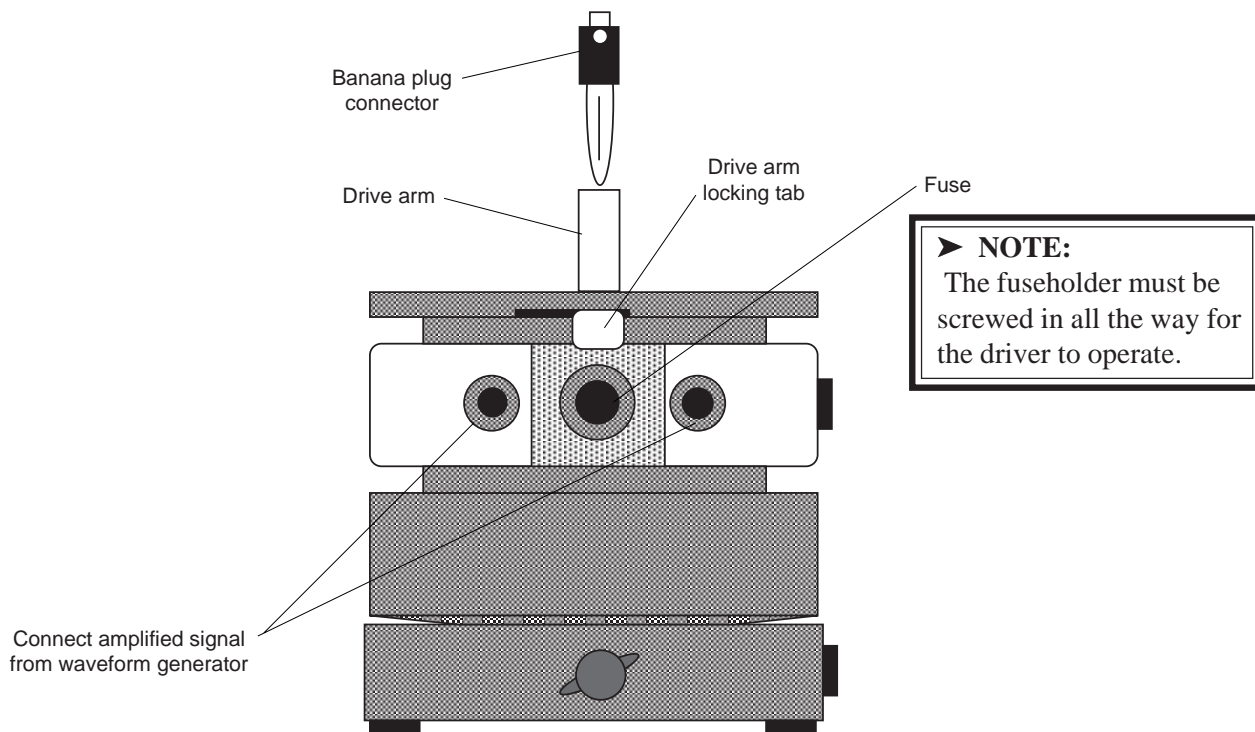


**Instruction Sheet
for the PASCO
Model SF-9324**

Variable Frequency Mechanical Wave Driver



Introduction

The SF-9324 Variable Frequency Mechanical Wave Drive lets you drive wave experiments with ease and accuracy. You will need a waveform generator with an amplifier capable of producing current up to 1.0 A—we recommend the PASCO Model PI-9587C Function Generator with a built-in amplifier and an accurate, digital frequency read-out, or the PI-9598 Student Function Generator.

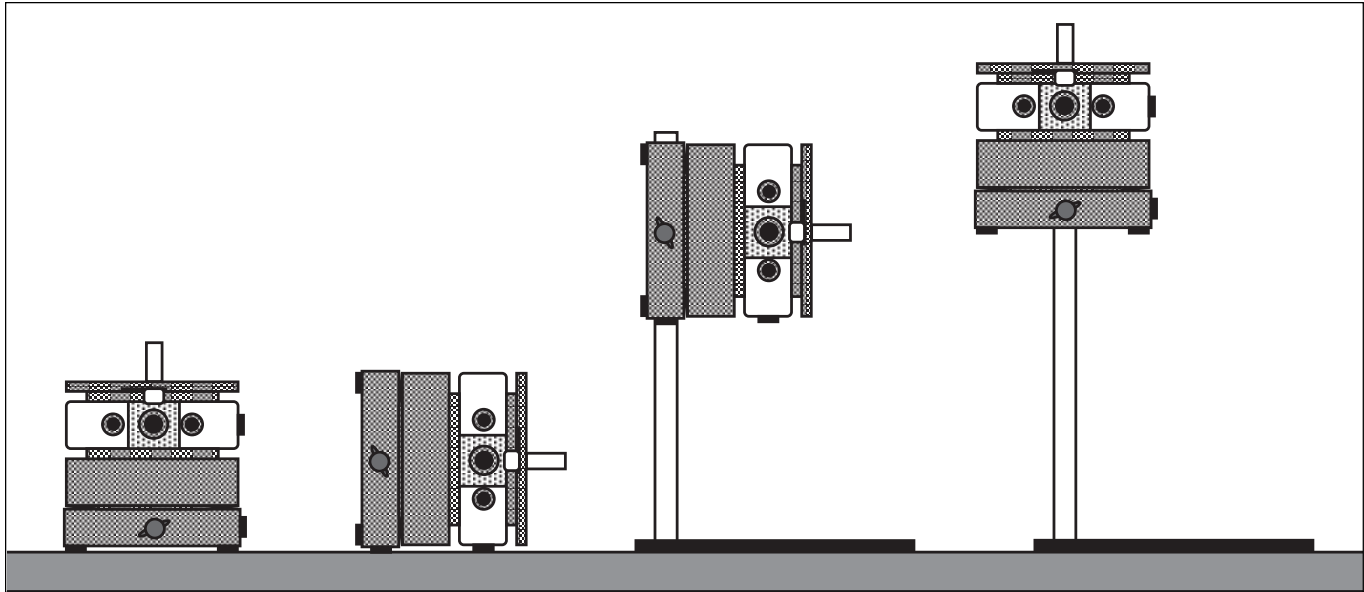
The mechanical wave driver is a strong, long-throw speaker, with an attached drive arm. The speaker will vibrate with any frequency you can produce with your waveform generator, from 0.1 Hz to 5 kHz, and with amplitudes up to 7 mm p-p at the low end of the frequency range. The waveform need not be a sine wave; other waveforms, such as square, triangular, or sawtooth, can be used.

You can attach the Mechanical Wave Driver to a wire or string using the provided banana plug connector, as shown on the following page. You can also design your own connectors. One method is to solder a piece of stiff wire to a banana plug connector, 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 1/2" rod in either a vertical or horizontal position.

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This instruction sheet edited by: Dave Griffith



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 by sliding the drive arm locking tab at the top of the unit to the Lock position.

Driver Won't Run?

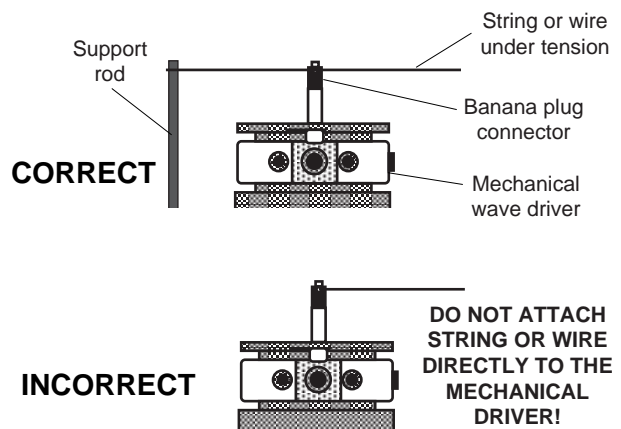
If at any time your Mechanical Driver fails to work:

- 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 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 getting into the unit, even if the fuse is good.

Operation

- ① Lock the drive arm by sliding the tab at the top of the driver to the Lock position. This protects the speaker as you connect the drive arm to other apparatus.
- ② Connect the drive arm to your experimental apparatus, using a banana plug connector.

NOTE: Avoid putting a sideways force on the driver arm. If you are driving a wire or string that has tension, attach the end of the wire or string to a sturdy support as shown below.



- ③ Unlock the drive arm.
- ④ Plug the output from your function generator/amplifier into the banana plug receptacles on the front of the Mechanical Driver.
- ⑤ Adjust the frequency and amplitude of the function generator to produce mechanical waves with the frequency and amplitude that you want. The current should not exceed 1.0 A.

Suggested Uses

- **Wave Demonstrators**

Use the Mechanical Wave Driver to drive a wave demonstrator, such as PASCO's Model SE-9600 or SE-9604, at any desired frequency and amplitude.

- **Waves in a wire or string**

Use it to produce waves in a stretched wire or string, as shown below. You can determine resonance frequencies as a function of length, or you can examine the relationship between wave velocity and the tension and mass per unit length of the string or wire.

- **Driven Harmonic Motion**

Use it to drive a mass on a spring and compare the amplitude of the oscillations with drive frequency. To attach a spring to the Wave Driver, remove the plastic cover to the banana plug connector by unscrewing it. There will be a hole through the connector to attach the end of the spring. Resonant modes of coupled oscillators can be investigated using air track gliders coupled by springs.

- **Chladni Plates**

Use it to vibrate sheets of metal or plastic, and observe the standing wave patterns that are formed at resonant frequencies. The patterns are easily seen by sprinkling sand onto the surface of the metal or plastic sheet.

- **Ripple Tanks**

Use the Mechanical Wave Driver as the wave source in a ripple tank. You'll have full control of the wavelength.

- **Molecular Motion**

Use the Mechanical Wave Driver with a Molecular Motion Model, such as PASCO Model SF-8563, to demonstrate the kinetic theory of gases.

Specifications

Frequency Range: 0.1 Hz to 5 kHz.

Amplitude p-p: 7 mm at 1 Hz, decreasing with increasing frequency.

Input Impedance: 8Ω

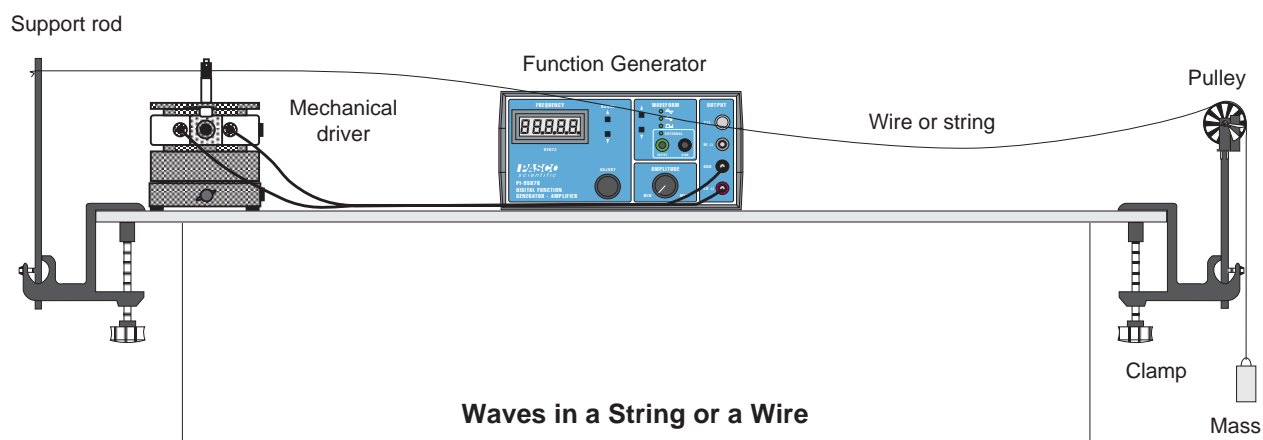
Max Current: 1.0 A, fuse limited.

Nominal Current Req'd: $< .25 \text{ A}$

Max Input: 6 V at 0.8 A

Limited Warranty

PASCO scientific warrants this product to be free from defects in materials and workmanship for a period of one year from the date of shipment to the customer. PASCO will repair or replace, at its option, any part of the product which is deemed to be defective in material or workmanship. This warranty does not cover damage to the product caused by abuse or improper use. Determination of whether a product failure is the result of a manufacturing defect or improper use by the customer shall be made solely by PASCO scientific. Responsibility for the return of equipment for warranty repair belongs to the customer. Equipment must be properly packed to prevent damage and shipped postage or freight prepaid. (Damage caused by improper packing of the equipment for return shipment will not be covered by the warranty.) Shipping costs for returning the equipment, after repair, will be paid by PASCO scientific.



Technical Support

Equipment Return

Should this product have to be returned to PASCO scientific, for whatever reason, notify PASCO scientific by letter or phone BEFORE returning the product. Upon notification, the return authorization and shipping instructions will be promptly issued.

► **NOTE: NO EQUIPMENT WILL BE ACCEPTED FOR RETURN WITHOUT AN AUTHORIZATION.**

When returning equipment for repair, the units must be packed properly. Carriers will not accept responsibility for damage caused by improper packing. To be certain the unit will not be damaged in shipment, observe the following rules:

- ① The carton must be strong enough for the item shipped.
- ② Make certain there is at least two inches of packing material between any point on the apparatus and the inside walls of the carton.
- ③ Make certain that the packing material can not shift in the box, or become compressed, thus letting the instrument come in contact with the edge of the box.

Address: PASCO scientific
10101 Foothills Blvd.
P.O. Box 619011
Roseville, CA 95678-9011

Phone: (916) 786-3800

FAX: (916) 786-8905

Feed-Back

If you have any comments about this product or this manual please let us know. If you have any suggestions on alternate experiments or find a problem in the manual please tell us. PASCO appreciates any customer feedback. Your input helps us evaluate and improve our product.

Contacting Technical Support

Before you call the PASCO Technical Support staff it would be helpful to prepare the following information:

- If your problem is computer/software related, note:

Title and Revision Date of software.

Type of Computer (Make, Model, Speed).

Type of external Cables/Peripherals.

- If your problem is with the PASCO apparatus, note:

Title and Model number (usually listed on the label).

Approximate age of apparatus.

A detailed description of the problem/sequence of events. (In case you can't call PASCO right away, you won't lose valuable data.)

If possible, have the apparatus within reach when calling. This makes descriptions of individual parts much easier.

- If your problem relates to the instruction manual, note:

Part number and Revision (listed by month and year on the front cover).

Have the manual at hand to discuss your questions.

To Reach PASCO

For Technical Support call us at 1-800-772-8700 (toll-free within the U.S.) or (916) 786-3800.

email: techsupp@PASCO.com

Tech support fax: (916) 786-3292