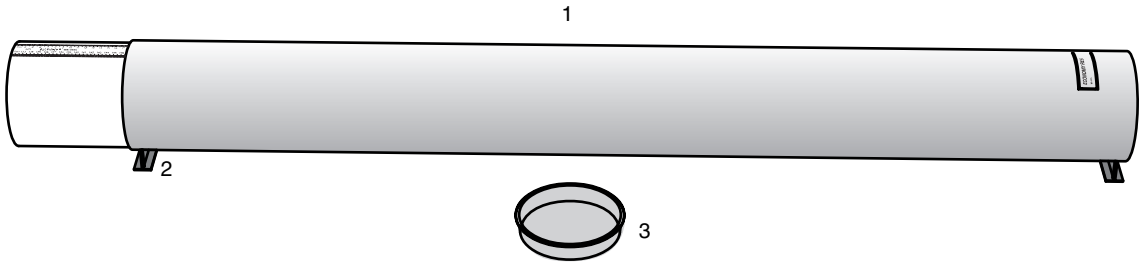
Economy Resonance Tube

WA-9495



Included Equipment	Part Number
1. Economy Resonance Tube Set	WA-9495
2. Feet (2 pieces)	648-08278
3. Plug	740-09890
Additional Equipment Recommended	
Open Speaker	WA-9900
Driver for Speaker:	
Sine Wave Generator	WA-9867
Digital Function Generator	WA-9587C
or	
GLX Power Amplifier	PS-2006

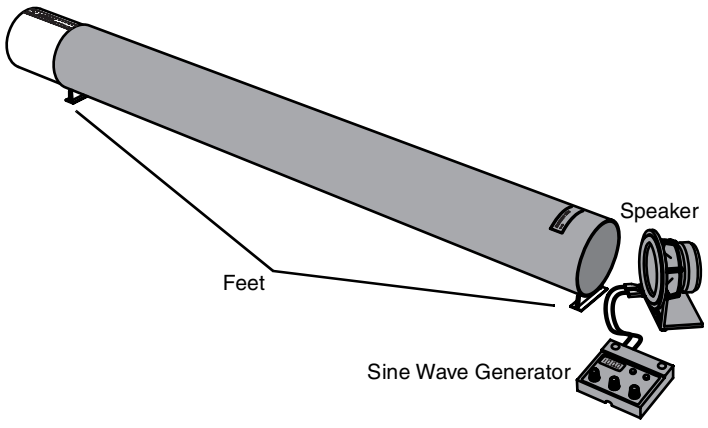


Figure 1: Set-up

Introduction

The Economy Resonance Tube is designed for the study of resonance in a column of air. The tube set includes an outer tube and an inner tube with a scale and a removable plug. The length of the air column is adjusted by moving the inner tube. When the plug is in place, the tube is closed at one end. Without the plug, the tube is open at both ends. There are two rows on the scale: one for measuring the resonating length when the plug is in place and one for when the plug is removed.

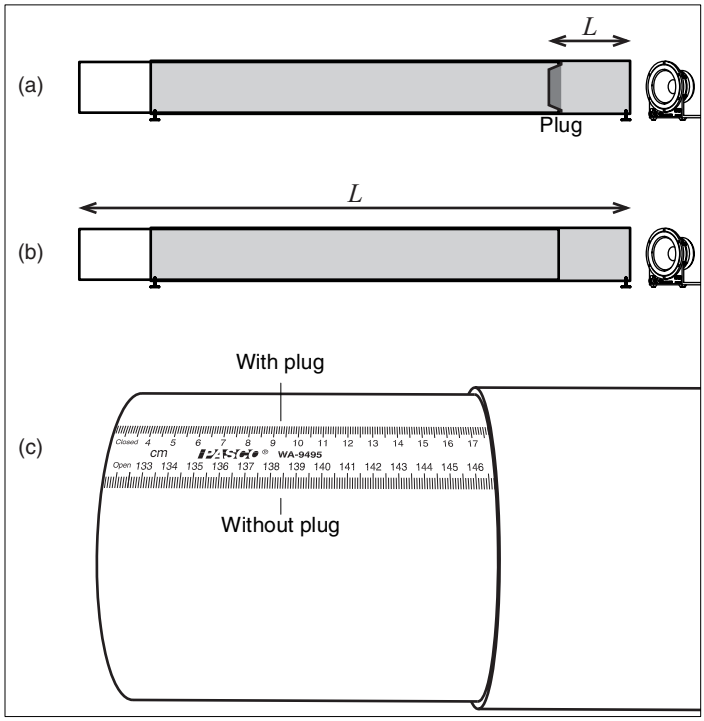


**Figure 2: (a) Closed-end tube with plug in place
(b) Open-end tube with the plug removed
(c) Closed-end length is measured on top scale;
open-end length is measured on the bottom scale**

The tube is driven by a speaker. The PASCO Open Speaker (WA-9900) is recommended because it does not have a resonating box that would resonate at different frequencies from the tube. The speaker can be driven by the Sine Wave Generator (WA-9867) or other suitable function generator.

When the tube is driven at a resonant frequency, the sound is louder.

Set-up

- Set up the equipment as illustrated in Figure 1 either with or without the plug.
- If the plug is installed, it must be on the end of the inner tube closest to the speaker (Figure 2a).
- Position the speaker at a 45° angle to the tube and several centimeters from the end.
- To remove or replace the plug, push the inner tube all the way in so it comes out at the speaker-end (Figure 3).

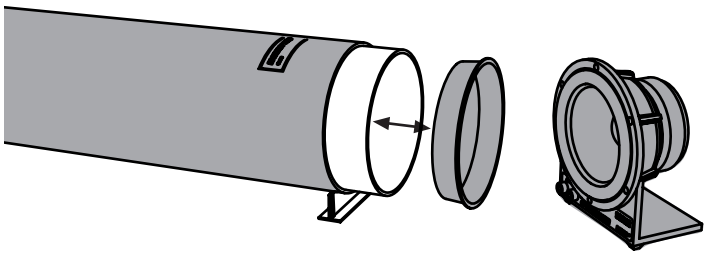


Figure 3: To remove or replace plug

Suggested Experiments

Constant Frequency, Variable Length

1. Set up the apparatus as a closed tube (with the plug), or an open tube (without the plug). Push the inner tube all the way in so that the resonating length is at its minimum.
2. Drive the speaker at a constant frequency.
3. Slowly increase the length of the tube. Note the lengths at which resonance occurs.

Constant Length, Variable Frequency

1. Set up the apparatus as a closed tube (with the plug), or an open tube (without the plug). If it is a closed, the resonating length should be at least 50 cm.
2. Start driving the speaker at 50 Hz.
3. Slowly increase the frequency. Note the frequencies at which resonance occurs.

Open and Closed Tubes

1. Do the constant-frequency experiment with a closed tube.
2. Repeat the experiment with the same frequency and an open tube.
3. Find the relationship between the closed-tube and open-tube resonant lengths.



Specifications

Outer tube length	1.3 m
Inner tube length	1.3 m
Diameter	0.15 m

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

Limited Warranty For a description of the product warranty, see the PASCO catalog.

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