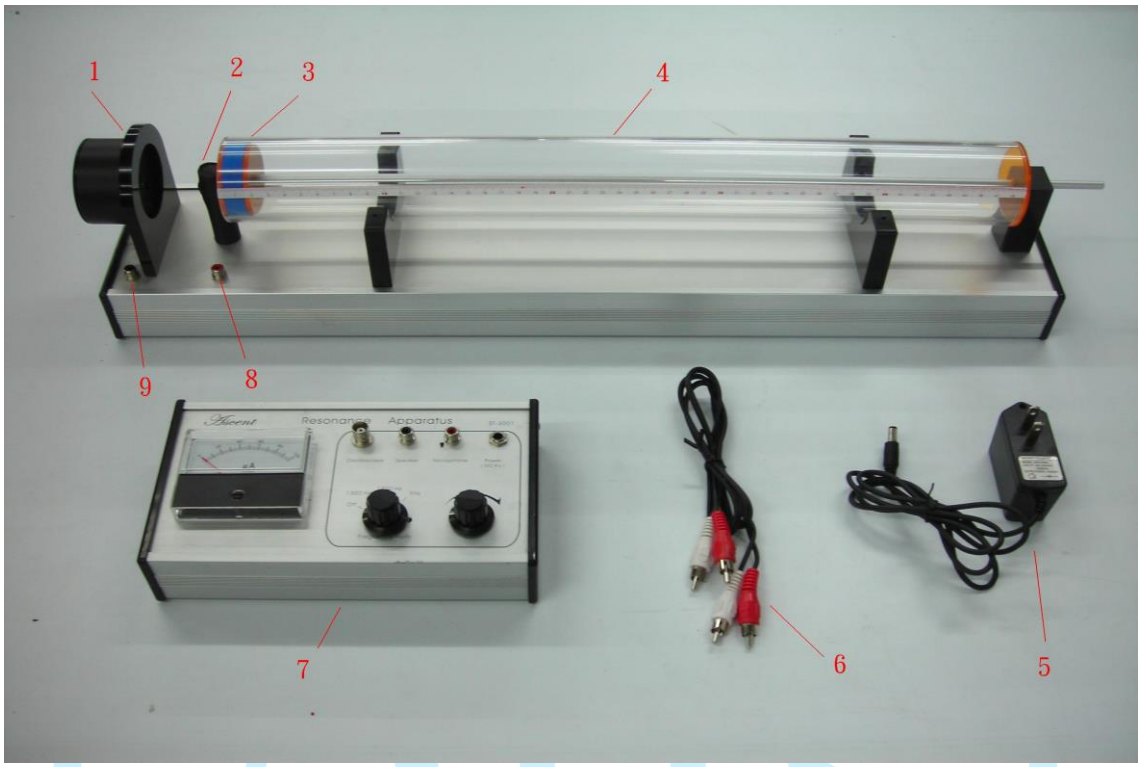
A01-743E-Y01

Experiment: Resonance Experiment (Piston)



NO	Accessory	Qty	NO	Accessory	Qty
1.	Sound Generator (Speaker)	1	2.	Sound Receiver (microphone)	1
3.	Push-pull Piston	1	4.	Resonance Tube	1
5.	Power Supply	1	6.	.AV Terminal Wire	1
7.	Somometer	1	8.	Microphone Jack	1
9	Speaker Jack	1			

(A)Steps

(a)the speed of sound in air

(1) Connect the accessories as shown in Figure 1 and 2.

Figure 1

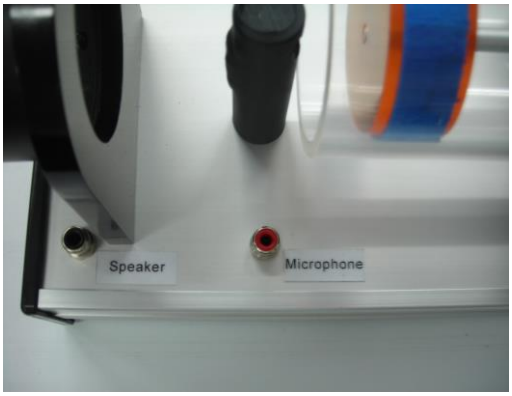


Figure 2

2. Measure room temperature *T* and record on the form

3. Push the movable plug to the bottom toward the sound receiver

4. Adjust the sound to 1300HZ and the value of the sound pressure meter to about 20. Slowly pull the movable plug out, and then the value of the sound pressure meter will change due to the location difference. Record the positions of the maximum value each time, not less than 3. (Figure 3 and 4).

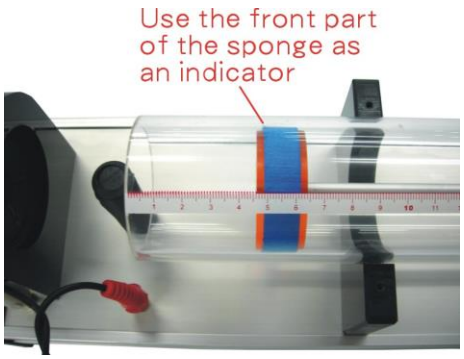


Figure **3**

Figure 4

(5) Switch the sound to 1900HZ, repeat step (4).

(6) Calculate the speed and compare with the theoretical value.

(b) Determination of unknown frequency

(7) Switch the sound to X HZ, and repeat step 4. Calculate the frequency.

Record Form

1. the speed of sound (a known frequency)

T (℃)			
f (HZ)		1300HZ	1900 HZ
resonance length (cm) (at the maximum current)	λ_1		
	λ_2		
	λ_3		
wavelength λ (m)	$2(\lambda_2-\lambda_1)$		
	$2(\lambda_3-\lambda_2)$		
	$\lambda_3-\lambda_1$		
wavelength avg. λ (m)			
$V_{exp\,t}$ (m/sec)			
V_{theo} (m/sec)			
percentage error (%)			

experimental value of velocity

$V_{exp\,t}$ =frequency f × wavelength λ

theoretical value of velocity

V_{theo} =**331+0.6T**

Percentage error

$$\frac{V_{exp\,t}-V_{theo}}{V_{theo}}\times 100\%$$

2. the speed of sound (an unknown frequency)

T (℃)		
V (m/sec)		
resonance length (cm) (at the maximum current)	λ_1	
	λ_2	
	λ_3	
wavelength λ *(m)*	$2(\lambda_2-\lambda_1)$	
	$2(\lambda_3-\lambda_2)$	
	$\lambda_3-\lambda_1$	
wavelength avg. λ *(m)*		
$f_{exp\,t}$ *(m/sec)*		
percentage error *(%)*		

experimental value of frequency

$$f_{exp\,t}=\frac{V}{\lambda}$$

percentage error

$$\frac{f_{exp\,t}-f_{theo}}{f_{theo}}\times 100\%$$

Atis Scientific Instruments Co.,Ltd
Address：1F., No.18, Nanming St., South Dist.,
Tainan City 702, Taiwan (R.O.C.)
E-mail:atis@atissi.com.tw
Tel: (886) -6-2925201
Fax: (886)-6- 2611476
Mobile:+886-9-8006-1128
Website: www.atis.com.tw