CENTRAL SCIENTIFIC COMPANY

OPERATING INSTRUCTIONS

Electronic Module System Ultrasonic Transducer
No. 32398

1. Purpose

The Ultrasonic Transducer allows the study of high-frequency wave phenomena above the audible range. Experiments which can be performed with the transducer include studies in wave diffraction, reflection, and interference.

2. Description

The transducer generates a strong output signal at about 40kHz when it is operated with the 32386 Amplifier Power Supply and the 32389 Function Generator.

3. Setup

The transducer resonates at about 40 kHz so experiments are best performed at this frequency. The power supply amplifier gain should be adjusted to mid-range or above and the DC offset adjusted around the zero point — until the strongest signal is observed.

The ultrasonic signal is received by a second ultrasonic transducer that can be plugged directly into an oscilloscope. Alternatively, the signal can be received into a second transducer, rectified with a diode and plugged into an ammeter. You can use a second amplifier power supply to amplify the signal.

4. Operation

Ultrasonic interference experiments require two ultrasonic transducers used for signal transmission and a third transducer for signal reception.

Use one transducer for transmission and a second one for reception to perform diffraction experiments. Separate the two transducers by an obstacle and evaluate the signal pattern on the opposite side of the obstacle. (Placing a wood obstacle about 8-10cm in front of the source transducer and exploring the area about 5-10cm behind the obstacle with an ammeter or oscilloscope will give a good working distance.)

Place two transducers on the same side of the obstacle to demonstrate ultrasonic reflection. The source should be about 10-15cm from the reflector. Probe the area between the source transducer and the reflector transducer to find two consecutive maximum (or minimum) current values. The distance between two consecutive points is one-half the standing wavelength.

Detailed information on these and other experiments can be found in the 30195-02 Student Lab Manual for the Cenco Electronic Modular System.

5. Maintenance

The Ultrasonic Transducer requires no special maintenance. If you should experience any difficulty with one, please contact Central Scientific Company, giving details of the problem. To ensure better service, please do not return any equipment to Central Scientific Company until you have received authorization.

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