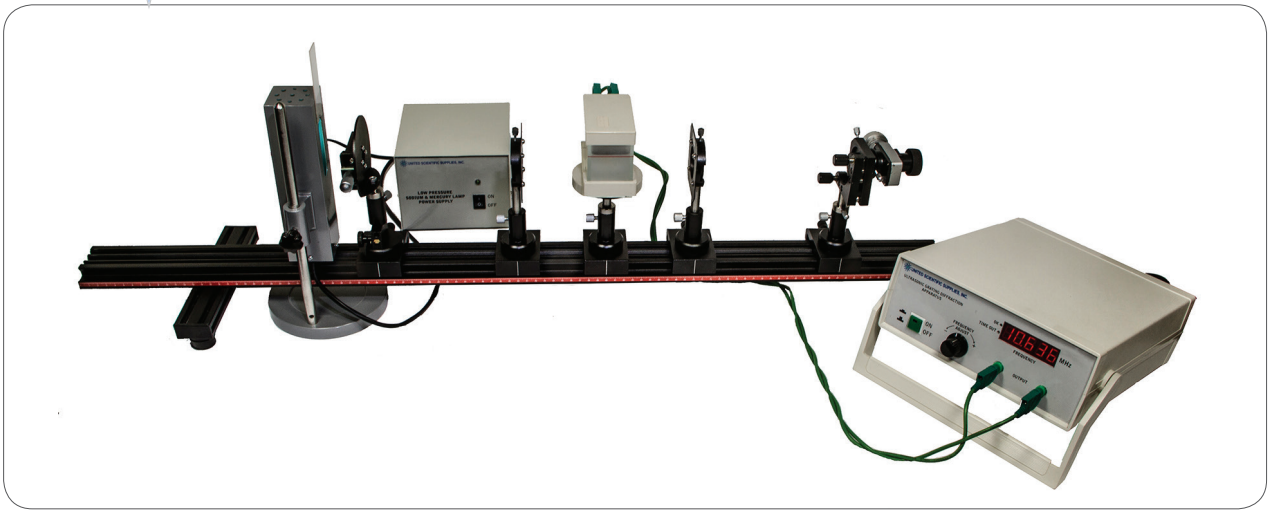
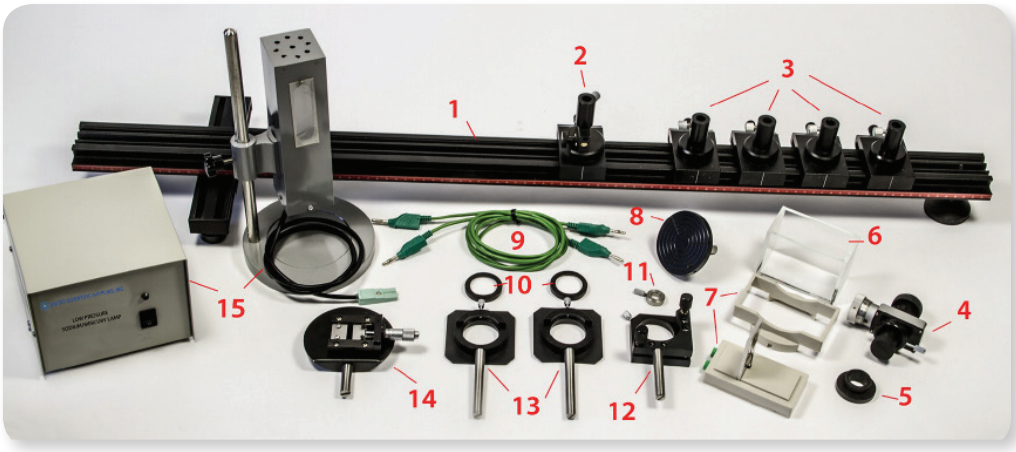
UNITED SCIENTIFIC SUPPLIES, INC.

Ultrasonic Grating Apparatus

NEW





Contents:

1. Optical Bench, 1000mm 1
2. Rider, Lateral Adjustment. 1
3. Riders, Plain 4
4. Micrometer Eyepiece 1
5. Eyepiece Adapter Ring. 1
6. Glass Tank for HF Grating 1
7. HF Generator and Frame 1
8. Optical Table. 1
9. Connecting Cords 2
10. Lenses, f = +170mm 2
11. Height Fixing Collar. 1
12. Eyepiece Holder, Adjustable 1
13. Lens Holders, Plain. 2
14. Adjustable Slit 1
15. Mercury Lamp, 20W, 110V 1

Item No.	Description
UGA001	Ultrasonic Grating Apparatus

- **Demonstrate the interaction of longitudinal sound waves and transverse light waves**
- **Precisely determine the speed of sound in liquids**
- **Use with any clear non-aggressive liquid of low electrical conductivity**

The Ultrasonic Grating Apparatus is both a unique demonstration of the interaction of longitudinal sound waves and transverse light waves and also a method for the precise determination of the speed of sound in liquids, which is otherwise difficult to do in the undergraduate lab.

The core of the apparatus is a parallel-sided glass tank that houses the liquid sample and contains a lead zirconate titanate (PZT) ultrasonic transducer. The transducer is energized by an RF signal in the 8-12 MHz range. Resonances can be found to set up a standing wave field in the liquid, which results in a periodic variation of the liquid's refractive index along the tank.

If a parallel light beam is now shone through the tank normally to the standing wave field, the liquid acts as a diffraction grating, producing fringes that can be measured with a micrometer eyepiece. In practice, the eyepiece is focused on the source slit and the exciting RF frequency is adjusted until the interference fringes appear.

The apparatus can be used for any clear non-aggressive liquid of low electrical conductivity. For aqueous solutions, the speed of sound is significantly affected by the dissolved matter. Distilled water and ethanol are suitable starting liquids.

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