MKII RIPPLE-STROBE TANK
LA50-400
INSTRUCTIONS FOR USE
SETTING UP
- Place the unit on a level bench and connect the power supply lead to the side socket. Plug the power unit into a mains supply and switch on.
- Switch the wave generator to OFF.
- Lift the viewing screen to gain access to the wave generator.
- Place the tank on the raised platform and half fill with clean water.
- The tank lid is removed for use— it is provided only for storage.
- Plug a dipper into the generator.
- Adjust the water level until the dipper just touches the surface (a syringe will prove invaluable throughout for this purpose).
- Switch on the waves and adjust as required.

ILLUMINATION
The light source can be set to constant (ON) for setting up purposes. When set to SYNC the light flashes at the same rate as the wave generator and gives perfectly stationary images. When set to FREE the strobe frequency can be controlled independently of the waves. By using a frequency close to the wave frequency the wave patterns can be made to move slowly to allow directions to be more easily seen.

INVESTIGATIONS
The various accessories allow different wave effects to be studied. Strobe illumination gives the best results at all frequencies. Take care to ensure no user of the apparatus is adversely affected by stroboscopic light. Higher frequencies give shorter wavelengths with the waves closer together. Since the patterns are stationary a sheet of tracing paper or OHP film can be placed on the viewing screen and drawings made for subsequent analysis.

REFLECTION
Use a plane wave dipper and metal plate in the tank. Observe the incident and reflected wave directions. Vary the plate angle to see the effect. A single point dipper generates circular waves and the reflection of these can also be studied.

DIFFRACTION
Use a plane wave dipper and a metal plate parallel to the waves. Diffraction around and behind the plate will be seen. If two plates are used with a narrow gap between them, circular waves will be seen generated at the gap.

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INTRODUCTION
This apparatus provides a simple and effective method for students to investigate the properties of waves. The tank is completely self contained, requiring no setting-up apart from the addition of water, and incorporates a built-in stroboscope to provide stationary or slowly moving images.

APPLICATIONS
- Properties of water waves.
- Properties of waves in general.
- Diffraction, refraction, reflection and interference.

GENERAL DESCRIPTION
Waves are generated in a small, rectangular tank which is placed on a raised, transparent shelf over the internal illumination source. The wave generator is built into the body of the unit and has an electronic drive circuit to vary the frequency which can also be synchronised to the light source. Dippers can be plugged into the generator by simply pushing them into the stem. A hinged, semi-opaque screen is situated above the tank and images of the waves are projected onto this for study. When access to the tank is required the screen is lifted out of the way. The sides of the tank are specially designed to absorb waves thus avoiding multiple reflections which cause confused patterns.
INTERFERENCE

Use the twin point dipper with nothing else in the tank. Constructive and destructive interference will be seen where the two sets of circular waves meet.

REFRACTION

This effect relies on the different speeds of water waves in different depths of water. The effects are only seen when there is a significant difference in the depths and to achieve this one of the transparent shapes is submerged in the tank water and the level of water reduced until there is just a film over the shape. We then have about 0.5mm depth above the shape and 6mm depth elsewhere, i.e a ratio of about 12:1.

1. Place the rectangular block at an angle to plane waves. As the waves slow down in the shallow water they bend round slightly towards the normal. If a single point dipper is used the distortion to the circular wave pattern is very obvious.
2. Place the convex lens shape in the tank. With plane waves there is a focusing effect.
3. Place the concave shape in the tank. With plane waves there is a divergence of the waves as they pass over the shape.

CARE, MAINTENANCE AND GENERAL TIPS

1. At the end of a session carefully lift the tank from the unit, pour away the water and dry the tank with a soft face tissue. Use non abrasive cloths to clean any of the tank surfaces. A lid is provided for storage of the tank to protect it when not in use.
2. Once dried, return the tank to its polythene bag for storage.
3. The best waves are generated when the dipper just touches the water surface. Use a syringe to adjust the water level rather than bend the dippers. A small amount of height adjustment is possible when the dipper is plugged into the generator arm.
4. Replacement tanks and dippers are available as spares from Lascells or from your distributor.

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