LASER ACCESSORIES – use with smoke box

Cat: PA1982-001 parts to enhance lasers

CONTENTS: LASER MODIFICATION KIT COMPONENTS

- 1 pce Metal washer with adhesive to attach to front of a Laser.
- 1 pce Laser Beam Splitter complete.
- 1 pce Laser Beam Expander with magnetic attachment.
- 1 pce Laser Beam Spreader with magnetic attachment.
- 1 pce Single slit photographic slide with magnetic face.
- 1 pce Double slit photographic slide with magnetic face.
- 1 pce 60^{o} very high density glass prism for dispersion.

USE OF THE LASER ATTACHMENTS: To fit to your own Laser.

METAL WASHER:

Take the metal washer with the self adhesive surface, peel back the protective paper and stick the washer to the front of your Laser so that the washer is concentric with the spot from which the beam comes. This metal washer provides a surface on the front of your Laser which can be used as a surface for a magnet to 'stick' to.

ADJUSTABLE FOAM BLOCKS:

Take the two tapered foam blocks and slide them on their tapered faces so that the thickness of the pair of blocks is such that the Laser, when resting on the blocks, points exactly through the centre line of a lens mounted in its holder on a rail.

This is then the normal working height of your Laser for most of the experiments.

BEAM SPLITTER:

Take the Beam Splitter and place it on books or a block so it is at the center line of the devices inside the housing. The adjustment knob must be at the opposite end to the transparent cover. Place the Laser behind the Beam Splitter so that the Laser beam enters the splitter at the end as indicated on the drawing on the panel of the splitter. Notice two Laser beams coming from the splitter.

Adjust the knob back and forth to swing one beam in respect to the other to form converging or diverging beams. Adjust the angle of the splitter so that the two beams converge somewhere inside the housing.

Note that the knob is stiff to turn. This is normal since the convergence of the beams, once set, should not easily be disturbed by accidental bumping etc.

BEAM EXPANDER:

Move the Laser back from the Beam Splitter. Place the Beam Expander on the front of your Laser so that the magnetic end 'sticks' to the steel washer fitted to the front of your Laser. Adjust it around with your finger tips until the Laser beam comes from the end of the expander in a large, evenly illuminated parallel beam (about 20mm diameter). When the expander is adjusted for position correctly, the beam should be even in density. Shine this expanded beam into the splitter so that now two fat beams are visible in the smoke in the housing.

BEAM SPREADER:

Remove the Beam Expander from the front of the Laser and fit the Beam Spreader. This is the very short version of the Beam Expander. Position this on the front of the Laser and remove the Beam Splitter altogether. Shine this beam directly into the housing. The beam will not be very intense so a little more 'Smoke' may be required. The beam should be strongly diverging. Point the beam into a bi-convex lens and observe the beam converging on the other side of the lens to a focal point.

DIFFRACTION SLITS:

Remove the Beam Spreader from the front of the Laser. Position one of the single or double slit photographic slides on the front of the Laser by magnetic attraction so that the laser beam passes through a slit. Observe the diffraction pattern on the wall or on a piece of cardboard at the other end of the housing.

Looking back along the ray towards the Laser *(DO NOT LOOK DIRECTLY INTO THE LASER BEAM)* and closely observe the bright and dark bands of laser light in space caused by diffraction of the slit(s).

VERY HIGH DENSITY GLASS PRISM:

The prism is a high quality device that provides a very broad dispersion of light. It is very effective at creating a full colour 'rainbow' in the housing when white light is diffracted through it.

The above notes are mainly for recognition of parts and do not relate necessarily to experiments to be performed. See the Student Experiment Notes for drawings and more precise applications of the above brief notes on operation.

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