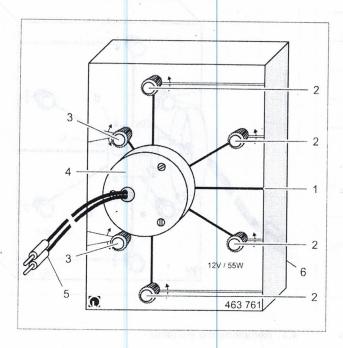
# KLINGER .

EDUCATIONAL PRODUCTS

www.KlingerEducational.com



86 Glen Cove Road Roslyn Heights NY 11577 toll 800-522-6252 tel 718-461-1822 fax 718-321-7756



- 1 Middle ray
- 2 Rotating mirrors for tight parallel light rays
- 3 Rotating mirrors for divergent light rays
- 4 Protective cover
- 5 Electrical power lead with 4-mm plug
- 6 Magnetic foil

## Safety notes

Smudges on the glass bulb, particularly skin oils deposited during handling, will become opaque when the lamp heats up.

 Do not touch the glass bulb with your fingers e.g. when mounting or replacing a lamp.

# Instruction sheet

Multiple-Ray Projector

ITEM CODE KO4125M

Safety Precaution:

Light box can get hot if left on for a long period of time.

Turn off and cool down before touching the box if it has become hot.

#### 1 Description

The multiple-ray lamp enables experiments in geometric optics. The ray paths are observed on the adhesive magnetic board. The light openings of four tight parallel rays and two divergent rays can be adjusted using rotating mirrors.

## 2 Technical data

Lamp.

12 V / 55 W

Catalog number of lamp:

KO4126

Dimensions:

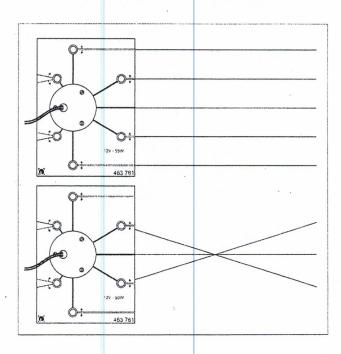
15 cm × 20 cm × 5 cm

Weight:

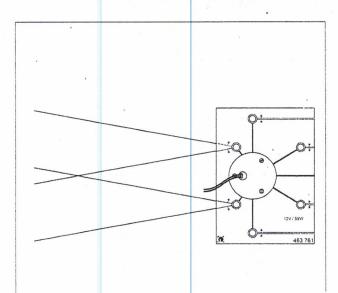
 $0.9 \, \text{kg}$ 

## 3 Operation

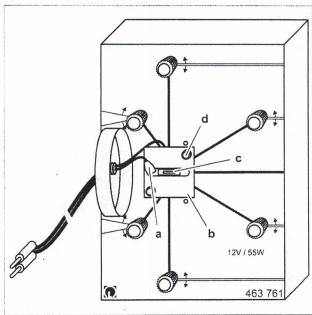
## 3.1 Demonstrating ray paths with tight parallel light rays



## 3.2 Demonstrating ray paths with divergent light rays



# 4 Replacing the lamp



#### 4.1 Removing the old lamp

- Loosen the retaining screws and remove the protective cover and the spacer sleeves.
- Disconnect the tab connector (a), loosen the knurled screws (d), lift off the plate (b) and take out the lamp (c).

## 4.2 Inserting the new lamp

- Insert the new lamp, put on the plate and tighten the knurled screws so that there is still play to move the lamp.
- Plug in the tab connector.
- Lay the lamp on a flat surface, turn all rotating mirrors outward and connect the lamp to a voltage of approx. 6 V.
- The rays can be observed in this way without producing excessive heat build-up.
- Adjust the position of the lamp until all rays are uniformly bright.
- Tighten the knurled screws tightly.
- Put on the spacers, place the protective cover on this and tighten the retaining screws.