

9. Rotate the lens turret (item #10) to select the right lens for ideal viewing.
10. The greater the magnification the darker the room should be.

### **HORIZONTAL PROJECTION**

1. Holding the neck of the microprojector with your left hand, place your right hand around the back of the dust proof revolving disk (item #14 available on X-1000-1 only) and pull the projecting mechanism up into the horizontal position
2. When using liquids and projecting horizontally, the instrument head must be placed in a vertical position. Bring the specimen into focus while in the vertical position, then move the mirror (item# 15) into the light path and adjust so the image appears on the screen. Select the lens desired and refocus.

### **LIGHT POLARIZATION**

1. Rotate the polarizing lens/analyzer (item #6 - white) until the lens is beneath the light beam.
2. Rotate the dust proof revolving disk (item #14) until the RED "P" on the edge of the disk is directly below the RED line.
3. Place a slide containing polarizing material on the stage.
4. Bring into focus and change colors by turning the polarizing lens/analyzer. (item #5)

### **USE AS A MICROSCOPE**

**(X-1000-1 only)**

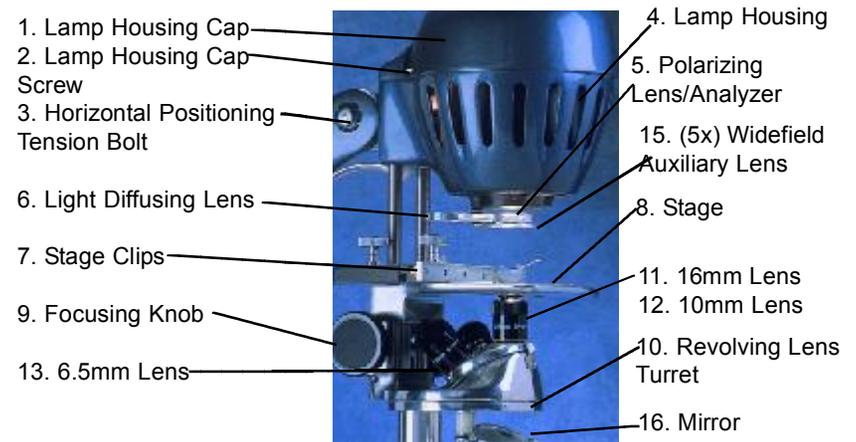
1. Rotate the auxiliary lens disk (item #14) until the RED "E" on the edge of the disk is directly below the RED line.
2. Rotate the light diffusing lens (item #5-darker lens) until it is under the light beam.
3. Place the unit in the horizontal position.
4. View the specimen through the 10X eyepiece tube (item #16).
5. Bring into focus using the 16mm lens; then select the lens desired.

### **MODEL TRIG OPERATING INSTRUCTIONS**

Instructions covering the use of Ken-A-Vision Microprojector Model X1000-1 apply except for the following:

1. Under "Vertical Projection" instructions disregard #4. Model Trig has only one objective lens.
2. Under "Vertical Projection" instructions disregard #7 entirely. Turning the knob between the two mounting rods adjusts the focus.
3. Under "Vertical Projection" disregard #9 in its entirety.
4. Instructions for the light polarization and use as a microscope are the same as for Model X1000-1

### **MODEL TECH A-11 OPERATING INSTRUCTIONS**



### **VERTICAL PROJECTION**

1. Turn the switch to the "ON" position.
2. Place a white sheet of paper between the legs of the base.
3. Rotate lenses (item#5 and #6), polarizing lens (item#14) 5X Wide Field auxiliary lens (item #15), and the mirror (item #16) so the light beam will not be obstructed.
4. Rotate the revolving lens turret (item#10) containing the three lenses, until the 16mm lens (item#11) is positioned so the light beam penetrates it.
5. Place a specimen slide on the stage (item#8), and center it under the light.
6. Turn the focusing knob (item#9) and lower the stage (item#8) to the lowest position; then reverse the direction until the specimen is brought into focus.
7. To use the 5X Wide Field Auxiliary lens (item#15), move it directly under the light beam. It can be used with any of these lenses.
8. Rotate the lens turret (item#10) to select the proper lens for ideal viewing.
9. The greater the magnification the darker the room should be.

### **HORIZONTAL PROJECTION**

1. Follow the above instructions; then holding the neck of the microprojector with your left hand, place your right hand around the back of the focusing knob (item#9), and pull the projecting mechanism up into the horizontal position.
2. When using liquids and projecting horizontally, the instrument head must be placed in a vertical position. Bring the specimen into focus while in the vertical position, then move the mirror (item#16) into the light path and adjust so the image appears on the screen. Select the lens desired and refocus.

### **LIGHT POLARIZATION**

1. Rotate the polarizing lens/analyzer (item #5 - darker lens) until the lens is beneath the light beam.
2. Rotate the Revolving Lens Turret (item #10) until the RED "P" on the edge of the disk is directly below the RED line.
3. Place a slide containing polarizing material on the stage (item #8).
4. Bring into focus and change colors by turning the polarizing lens (item #14)

## USE AS A MICROSCOPE

(Requires optional 10x eyepiece tube)

1. Rotate the light diffusing lens (item #6) until it is under the light beam.
2. Place the unit in the horizontal position.
3. View the specimen through the 10x eyepiece tube. (optional accessory for this model)
4. Bring into focus using the focusing knob (item #9)

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### MODEL TYRO OPERATING INSTRUCTIONS

Instructions covering the use of the Ken-A-Vision Microprojector Model Tech A-11 apply except for the following:

1. Under "Vertical Projection" discard #4.
2. Under "Vertical Projection" discard #8.

### LIGHT POLARIZATION

1. Rotate the polarizing lens/analyzer (item #5-darker lens and #14) until the lens es are beneath the light beam.
2. Place a slide containing polarizing material on the stage item (item#8).(Option to prepare a slide, crumple a small amount of cellophane from a cigarette wrapper, stick it to a strip of scotch tape approximately 2 inches long; then place it on a slide).
3. Bring into focus and change colors by turning the polarizing lens/analyzer.

## USE AS A MICROSCOPE

(requires optional 10x eyepiece tube)

1. Rotate the light diffusing lens (item#6-white) until it is under the light beam.
2. Place the unit in the horizontal position.
3. View the specimen through the 10X eyepiece tube. (Purchase as an accessory.)
4. Bring into focus using the focusing knob (item#9).

### LAMP REPLACEMENT- ALL MICROPROJECTORS

1. When a lamp burns out, the switch MUST be placed in the "off" position and the unit UNPLUGGED.
2. DO NOT replace until lamp has cooled.
3. Remove the lamp housing cap screws (item#2), lift off the lamp housing cap (item #1), and replace the defective lamp. Use KAVGE EKL 150W lamp. Use as soft cloth when replacing the lamp - Do Not touch with your bare hands  
KEEP COVERED WHEN NOT IN USE -DUST IS ITS ENEMY

### ACCESSORIES

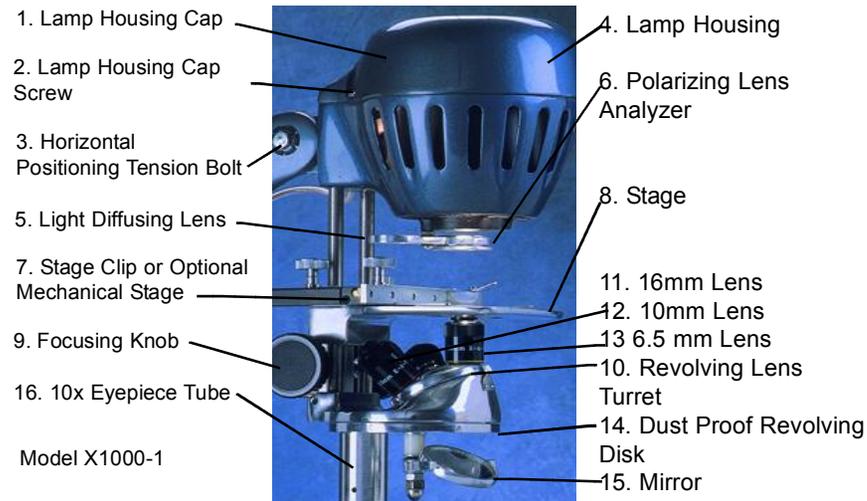
(available from the factory)

KAVOL065 6.5mm Lens (43x)  
KAVOL016 16mm Lens (10x)  
KAVEP001 10x Eyepiece Tube  
KAVGEEKL Lamp (Quartz Iodine 150 watt)  
KAVSCOACT - Laboratory Activity Book

KAVOL010 10mm Lens (20x)  
KAVOL030 30mm Lens (4x)  
T5045 Mechanical Stage  
KAVEXPM Classroom Experimental Manual  
T5090 - Vinyl Dust Cover (large)

## MICROPROJECTOR OPERATING INSTRUCTIONS

The microprojector will project either horizontally or vertically. When used with a large group or entire class, project from the horizontal position. For small groups or an individual, project vertically. Use whenever possible, as everyone sees the same image, making it ideal for study, discussions, and lectures.



### VERTICAL PROJECTION

1. Turn the switch to the "ON" position.
2. Place a white sheet of paper between the legs of the base.
3. Rotate lenses (item #5 and #6) and mirror (item #15), so the light beam will not be obstructed.
4. Rotate revolving lens turret (item #10) containing the three lenses, (item #11) is positioned over until the 16mm lens so the light beam penetrates it.
5. Rotate the Dust Proof Revolving disk (item #14) until the RED "C" on the side of the disk is directly under the RED line on your upper disk.
6. Place a specimen slide between the prongs of the mechanical stage (item #7) or under the stage clips, and center it under the light.
7. Using the focusing knob (item #9), at either side, lower the stage (item #8) to the lowest position and then reverse the direction until the specimen is brought into focus.
8. To use the 5x Wide Field auxiliary lens, rotate the revolving dust proof revolving disk (item #14) until the RED "A" is under the RED line on the upper disk.

## TO MAKE YOUR OWN MICROSCOPIC SLIDES

You may easily preserve choice specimens for many years by making your own microscope slides. The only materials required are blank microscope slides, cover glasses, unflavored gelatin from any grocery store, and clear cement.

1. In preparing an ordinary specimen first thoroughly clean the slide and a cover glass to be used.
2. Prepare a small quantity of gelatin according to the directions. Use as little gelatin on the slide as possible, just enough to cover the specimen without leaving an air bubble when the cover glass is laid on top.
3. Set the slide aside so that it may “gel” undisturbed.
4. When the gelatin has solidified carefully trim the edges of the cover glass, removing any gelatin that may have escaped from beneath the cover glass.
5. Finally, run a thin coat of clear cement around the edges of the cover glass, which insures an air tight seal.

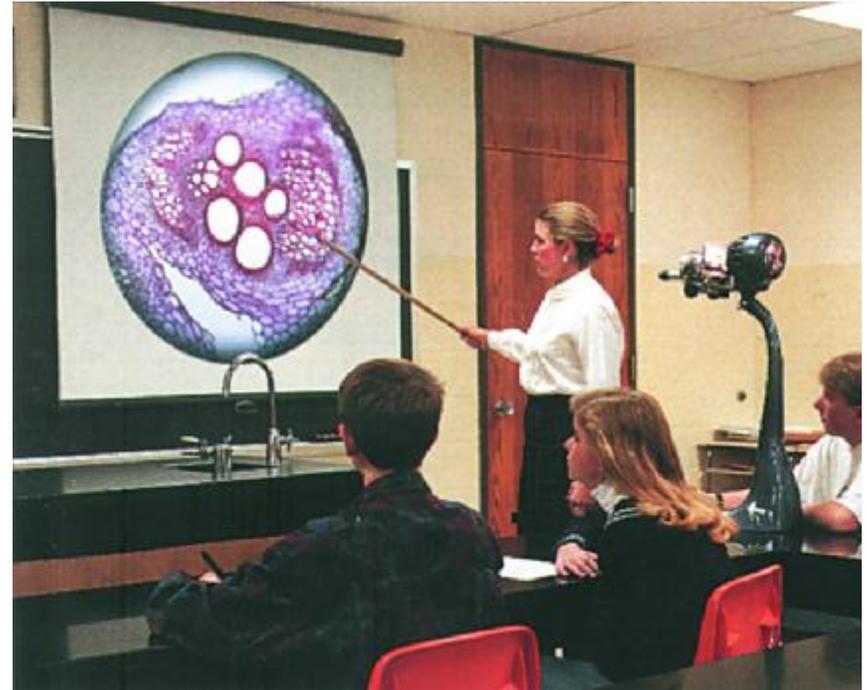
Care should be taken to make the slide as thin as possible without crushing the specimen. Sometimes, however, you may wish to mount a specimen which is rather thick. In this case you should place pillars under the edges of the cover glass which raises it to the desired thickness. Many times you will find that tiny pieces of a broken cover glass provide adequate thickness.

### WARRANTY

Ken-A-Vision Microprojectors are covered by a lifetime warranty against defective material or workmanship. If defective, forward to us, prepaid, and it will be repaired or replaced free of charge for the life of the instrument. The warranty does not cover normal wear, breakage, or abuse.



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## MICROPROJECTOR INSTRUCTION MANUAL

## INTRODUCTION

Thank you for the purchase of your Ken-A-Vision Microprojector. It is important you read the information contained in this manual to acquaint yourself with the operation, uses, and benefits of your Ken-A-Vision Microprojector.

With Microprojectors from Ken-A-Vision, any slide that is used on a microscope can be shown to your entire classroom at the same time. This instrument is effectively used from elementary to college level courses. Ideal in teaching visually impaired and physically challenged individuals or groups.

## FEATURES

\* A powerful 150 watt quartz iodine lamp with double condensing system (light intensifying system) provides a crisp, clear projected image from edge to edge.

\* The cooling system fan not only helps preserve living specimens, but also extends the life of the lamp.

\* With the objective lens on the reverse side of the slide, you never have to worry about the lens touching your medium

\* The depth of field of the objective lens enables viewing objects through a petrie dish.

\* Projection can be either vertically onto the table or horizontally onto a screen or wall.

## STANDARD FEATURES

- |                                      |                               |
|--------------------------------------|-------------------------------|
| * Patented Cooling System            | * 150 Watt Quartz Iodine Lamp |
| * Double Condensing System           | * Amalloy Aluminum            |
| * Heat Filtered (Protects Specimens) | * UL Registered               |
| * Dust Cover                         | * 70-80 cm in height          |

## USING A CALIBRATED MECHANICAL STAGE

If your Microprojector is equipped with the calibrated mechanical stage this information will be valuable to you. Besides being an excellent means of moving specimens across and vertical with the field of the microprojector, the calibrated scale can measure the length and width of objects accurately for you. With this as a guide you may also determine with reasonable accuracy the thickness of objects using the previous measurements as guides in its relative proportions.

Let us assume that you wish to measure the dimensions of a salt crystal. Follow these steps:

1. Focus your Microprojector sharply on the desired salt crystal.
2. Draw a line at the *left* side of the crystal on the paper between the microprojector feet.
3. Read the longitudinal micrometer (the one parallel to the slide). Read it first to the nearest *whole number* opposite the 0 mark.
4. Read the tenths up this scale until the lines match up. Write this down after the whole number.
5. Turn the knob on the mechanical stage until the *right* side of the crystal is at the line you drew on the paper.
6. Reread the micrometer as above, and write the number down. The difference between these two numbers is the width of the crystal in millimeters and tenths of millimeters (NOTE: one inch equals about 25mm).
7. Follow the same procedure in finding the width of the crystal, this time drawing the line at the top of the crystal and using the vertical micrometer (the one at right angles to the slide).
8. By careful focusing *through* the crystal determine its thickness relative to its other dimensions.