

**BESELER**

# Dichro 45S

colorhead/instruction manual

## IMPORTANT SAFETY INSTRUCTIONS

When using your photographic equipment, basic safety precautions should always be followed, including the following:

1. Read and understand all instructions before using.
2. Close supervision is necessary when any appliance is used by or near children. Do not leave appliance unattended while in use.
3. Care must be taken as burns can occur from touching hot parts.
4. Do not operate appliance with a damaged cord or if the appliance has been dropped or damaged---until it has been examined by a qualified serviceman.
5. Position the cord so that it will not be tripped over, pulled, or contact hot surfaces.
6. If an extension cord is necessary, a cord with a current rating at least equal to that of the appliance should be used. Cords rated for less amperage than the appliance may overheat.
7. Always unplug appliance from electrical outlet before cleaning and servicing and when not in use. Never yank cord to pull plug from outlet. Grasp plug and pull to disconnect.
8. Let appliance cool completely before putting away. Loop cord loosely around appliance when storing.
9. To reduce the risk of electric shock, do not immerse this appliance in water or other liquids.
10. To avoid electric shock hazard, do not disassemble this appliance, but take it to a qualified serviceman when some service or repair work is required. Incorrect reassembly can cause electric shock when the appliance is used subsequently.
11. The use of an accessory attachment not recommended by the manufacturer may cause a risk of fire, electric shock, or injury to persons.
12. Connect this appliance to a grounded outlet.
13. Disconnect this unit from its source of supply before replacing the projection lamp.

## SAVE THESE INSTRUCTIONS

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## DICHRO 45S SPECIFICATIONS

### Line Voltage:

Model #8278, 120V  $\pm$ 10%, 60Hz

Model #8279, 220/240V  $\pm$ 10%, 50Hz

**Electronics:** Internally stabilized, solid state

**Lamp:** Catalog #8108 — 82V, 250W

**Type of Filtration:** Dichroic Interference Filters

**Filtration:** Yellow, Magenta, Cyan

**Auxiliary Filtration:** IR, UV filtration integral in each mixing chamber

**Blower:** Self-contained rotary fan

**Mixing Chambers:** Interchangeable —

*Standard* 4x5

*Optional* 6x7 (Catalog #8292)

35mm (Catalog #8291)

Condenser light source with adapter (Catalog #8294)

**Dimensions:** 17 $\frac{3}{4}$ " (451mm) wide, 7" (178mm) high, 9 $\frac{1}{8}$ " (232mm) deep. Overall height mounted on enlarger, measured from support stage:

Diffusion mode — 8" (203mm); Condenser mode — 13 $\frac{1}{2}$ " (343mm)

**Weight** (with mixing chamber): 14 lbs. 4 oz. (6.5 Kg)

**Shipping Dimensions:** 21" (533mm) wide, 14" (356mm) high, 13 $\frac{1}{2}$ " (343mm) deep

**Shipping Weight:** 18 lbs. 6 oz. (8.3 Kg)

## INTRODUCTION

Congratulations! With your purchase of the Beseler Dichro 45S Colorhead you have acquired a truly versatile colorhead. The Dichro 45S is a solid-state, dichroic colorhead incorporating a self-contained, stabilized power supply and cooling system. It represents the latest in electronic technology applied to color printing.

The colorhead is designed to work equally well with the Beseler 45V-XL, or 45M series enlargers and installation is simple. The Dichro 45S offers diffusion or condenser (optional) color and black and white printing for formats ranging from sub-miniature to 4"x5" negatives.

We strongly recommend that you thoroughly read this instruction manual to fully acquaint yourself with the colorhead and learn how to take advantage of its many capabilities.

If you desire to begin printing immediately with your Dichro 45S, we suggest that you familiarize yourself with the colorhead and its controls (Figures 1 and 2 with descriptions) and then follow the directions in Section I, Installation Instructions, and Section IV, How to Use the Dichro 45S. The remainder of the manual contains additional valuable information which will increase your understanding of the Dichro 45S.

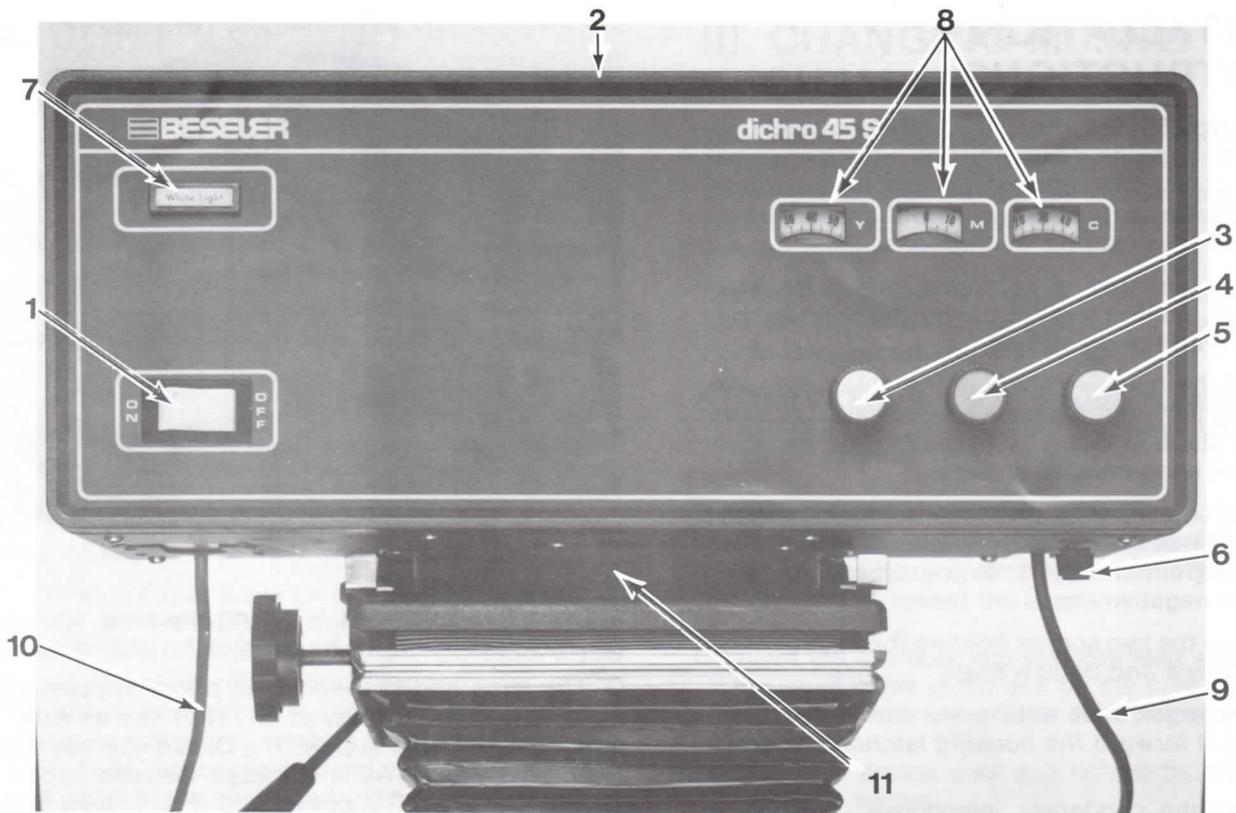


Figure 1

1. **POWER SWITCH** 2-position switch:  
"Off" — Colorhead off  
"On" — Operate position
2. **ACCESS DOOR** Provides entry to the colorhead to change mixing chamber or lamp.
3. **YELLOW FILTRATION CONTROL** Sets desired amount of yellow filtration.
4. **MAGENTA FILTRATION CONTROL** Sets desired amount of magenta filtration.
5. **CYAN FILTRATION CONTROL** Sets desired amount of cyan filtration.
6. **WHITE LIGHT LEVER** Removes filters from light path for "white light" focusing.

7. **WHITE LIGHT INDICATOR** Illuminates when paper saver circuit is activated. Prevents wasted color print paper by not permitting exposure to unfiltered light.
8. **FILTRATION INDICATOR WINDOWS** Displays filtration values of Y, M and C.
9. **POWER CORD** Three-prong plug connects to convenience outlet on enlarger (or wall outlet).
10. **TIMER CORD** Three-prong plug connects to outlet on timer.
11. **MOUNTING COLLAR** To attach colorhead to a Beseler 45M series enlarger.

12. **MIXING CHAMBER** Interchangeable chambers available to optimally illuminate the selected format (4x5, 6x7, 35mm, condenser).
13. **SAFETY SWITCH** Shuts off power when access door is opened.
14. **LOCATING PIN AND SLOT** Correctly positions mixing chamber in colorhead.
15. **HEAT ABSORBING GLASS** Two-piece glass absorbs infra-red.
16. **LAMP DOOR** Access to change lamp.
17. **LAMP** Type 8108, 82 volts, 250 watts.
18. **LAMP EJECTOR** Aids in removing lamp.

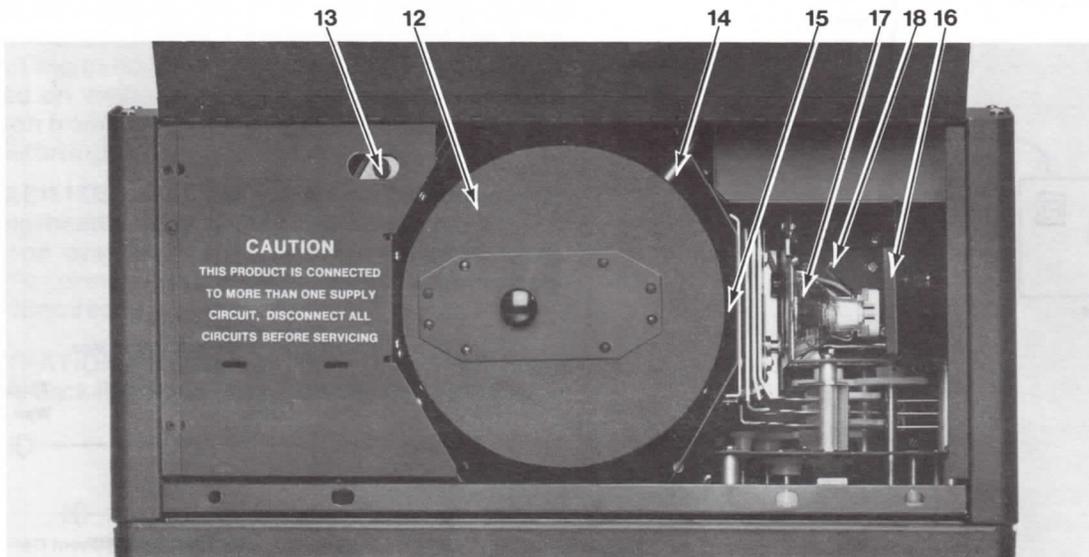


Figure 2

# I. INSTALLATION INSTRUCTIONS

The Dichro 45S Colorhead is a self-contained unit, and is shipped with a 4x5 diffusion mixing chamber and 250 watt lamp in place. To mount the colorhead onto a Beseler 4x5 enlarger for diffusion printing, just follow these simple instructions:

A. If your enlarger is equipped with a Resistrol accessory, unplug it, as it cannot be used in conjunction with the colorhead.

B. Adjust the negative stage of the enlarger to the 4"x5" position on the negative size scale. Lock the negative stage in place by tightening the negative stage lock knob on your enlarger.

**NOTE:** The illumination system of the colorhead requires that the upper bellows remain in the 4x5 position (fully collapsed) during diffusion printing with all negative sizes.

C. Remove the two screws holding the negative size scale in place and detach scale.

*If your enlarger does not have a condenser lamphouse, pull forward the housing latches and go on to step E.*

D. Unplug the condenser lamphouse power cord and remove the lamphouse/condenser assembly by pulling the support latches forward (see Fig. 3) and lifting the assembly clear of the enlargers. Store the assembly in a safe, dust-free place.

E. Place the colorhead on the enlarger so that the colorhead mounting collar (Fig. 1, item 11) slides into the opening in the support stage.

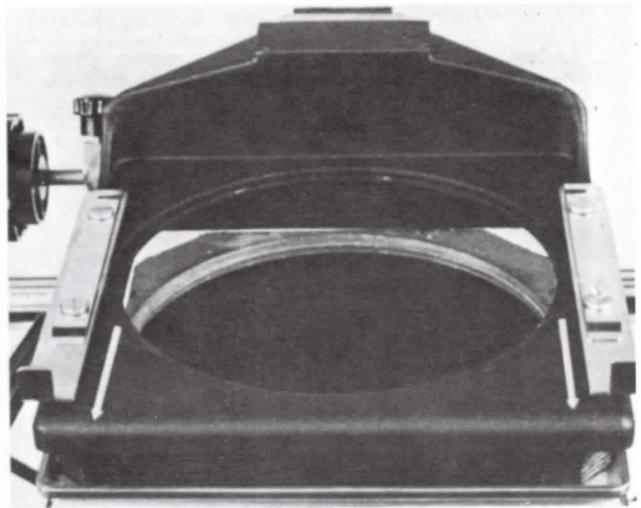


Figure 3

F. Once the colorhead is sitting squarely on the enlarger, lock it in place by pushing the latches back.

G. The lamp and the electronic power supplies in the colorhead are stabilized. **DO NOT** use an external stabilized power supply. The Dichro 45S has two line cords—one for AC line voltage, the other to connect to the timer. The power cord (Fig. 1, item 9) is on the right and should be plugged into the convenience outlet on the enlarger motor box (on 45MXT) or to a grounded AC outlet. The grey timer cord (Fig. 1, item 10) is on the left underside of the colorhead and is inserted in the "Enlarger" outlet on your timer. See Figure 4 for typical AC connections. You are now ready to begin diffusion printing with your Dichro 45S.

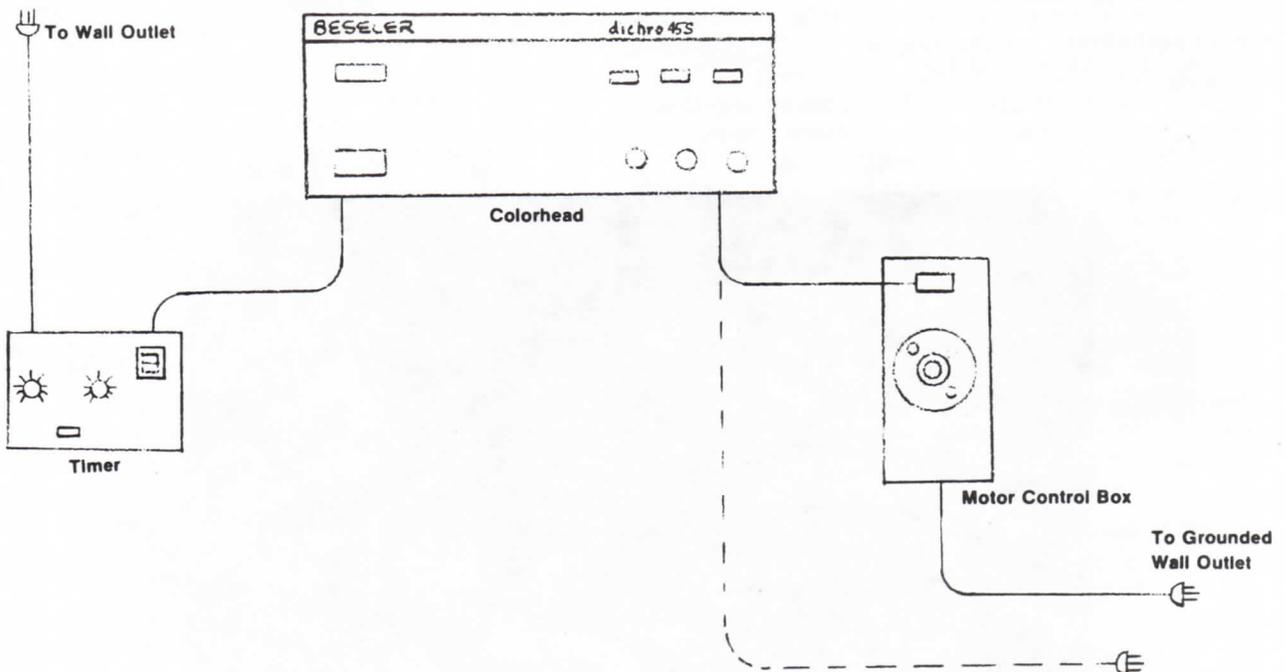


Figure 4

For Enlargers Without Convenience Outlet, Connect Directly to Grounded Wall Outlet.

## II. CONTROLS AND COMPONENT DESCRIPTIONS

A. **POWER SWITCH** Two position switch (OFF, ON). Activates blower and all circuitry.

B. **FILTRATION CONTROLS** By turning the appropriate knob, any desired amount of yellow, magenta or cyan filtration may be introduced into the light path. Indicator windows above controls are labeled "Y", "M" and "C" respectively.

C. **WHITE LIGHT LEVER/PAPER SAVER CIRCUIT** The White Light Lever removes the dichroic filters from the light path for easy "white light" focusing. Pushing the lever away from you moves the filters out of the light path. Pulling the lever toward you returns the filters to their original position.

The unique Paper Saver Circuit built into the Dichro 45S will prevent the lamp from turning on if the filter retractor is left in the "White Light" position. If you should forget to return the filter retractor to the "Filtration" position after focusing, the colorhead will not permit you to waste a sheet of paper with a "white light" exposure. Instead, an indicator on the front panel of the colorhead will light up, reminding you to reset the timer and return the retractor to the forward position. Note that while the colorhead cannot be turned on with the filters retracted, the filters may be retracted when the colorhead is turned on. The Paper Saver Circuit puts an end to paper waste caused by unfiltered exposures.

D. **MIXING CHAMBERS** A special 4x5 diffusion mixing chamber is standard with the Dichro 45S. Accessory mixing chambers for 6x7 and 35mm diffusion printing (Catalog #8292 and 8291 respectively) and a condenser chamber (Catalog #8294) are available from your Beseler dealer. All chambers include IR and UV filtration.

E. **COOLING SYSTEM** The Dichro 45S cooling system is of flow-through design, incorporating a self-contained rotary fan. The fan, located on the left side of the housing, drives in cool air through the inlet on the left, across the electronics and the lamp and out the exhaust vent on the right. The blower is secured on vibration mounts which prevent undue vibration from reaching the negative and lens stages and distorting the image.

F. **STABILIZED POWER SUPPLY** The voltage for the colorhead's lamp and electronics are internally stabilized over an AC line voltage range of  $\pm 10\%$  from the normal. A separate stabilized power supply is not required.

G. **FILTRATION INDICATOR WINDOWS** The analogy dials are back-lighted when the main power switch is on.

## III. CHANGING MIXING CHAMBERS

The Dichro 45S comes with a 4x5 diffusion mixing chamber as standard equipment. Optional diffusion chambers for 6x7 and 35mm formats and a Condenser Mixing Chamber are available from your Beseler dealer.

Whenever you wish to change mixing chambers, be sure the power switch is in the "Off" position and follow the procedure outlined below.

- A. Open the access door by unscrewing the two thumb screws located on top of the colorhead. Carefully lift out the chamber.
- B. Pick up the other chamber and make sure the mixing chamber window (heat absorbing glass—Fig. 2, item 15) and the locating pin (Fig. 2, item 14) are on the right; that is, toward the lamp.
- C. Insert the chamber into the colorhead and engage the locating pin in the slot on the right side of the chamber area housing. Slide the chamber into place.
- D. Close the access door and tighten the two thumb screws to secure.

# DICHRO 45S

The following information should help you to get started making color prints from negatives with your new Dichro 45S colorhead.

A. Put your negative into the enlarger. Size, compose and focus the image as usual.

B. Dial in the recommended starting filter pack of 50Y + 40M for Kodak RA-4 paper. Set your lens to f/8 in the DIFFUSION mode and f/16 in the CONDENSER mode.

C. Make a test strip for density, varying only the exposure time (not the lens aperture or the filter pack).

D. Evaluate the test strip for density.

1. If any section of the test strip shows exactly the right density, you're all done testing. Record the exposure time which produced it.
2. If one section of the test strip is too light and the adjoining section is too dark, an intermediate exposure time is required. For example: If the exposure time for the light section was 10 seconds and the exposure time for the dark section was 20 seconds, the proper exposure time will be somewhere in between 10 and 20 seconds. (If in doubt, you might want to make a second test strip using intermediate exposure times such as 12-14-16-18 seconds.)
3. If all four sections are too light, open up the aperture of your enlarging lens by two full f/stops and repeat the test using the same exposure times. (The original test strip was underexposed.)
4. If all four sections are too dark, close down the aperture of your enlarging lens by two full f/stops and repeat the test using the same exposure times (the original test strip was overexposed).
5. Once the aperture setting and exposure time have been determined, the next step is to identify the PREDOMINANT color on the correctly exposed section of the test strip.

E. Identify the Predominant Color.

If your test strip happens to be perfectly color-balanced, you are immediately ready to make a color print without making any adjustment to the filter pack. It's far more likely, however, that your test strip will have a predominant color cast which you will want to remove before making your full-size color print. You must first identify the predominant color cast and then refer to the COLOR BALANCING table for directions on how to remove it.

The table shows what adjustments are necessary to color correct prints made from negatives or slides.

If first print made from a negative is too:	Or the first print made from a slide is too:	MAKE THIS CORRECTION BEFORE EXPOSING THE NEXT PRINT:
Yellow	Blue	Add Yellow or Subtract Cyan and Magenta
Magenta	Green	Add Magenta or Subtract Cyan and Yellow
Cyan	Red	Add Cyan or Subtract Yellow and Magenta
Blue	Yellow	Subtract Yellow or add Cyan and Magenta
Green	Magenta	Subtract Magenta or add Cyan and Yellow
Red	Cyan	Subtract Cyan or add Yellow and Magenta

Experience will show how much of an adjustment is necessary for prints requiring varying degrees of correction and what starting filter pack to use in making a first print. Note that there are two possibilities for each correction. Do not dial in the third filter value since the combination of filtration (Y + M + C) will result in neutral density causing loss of illumination and the need to increase exposure.

If you have just started color printing, it is a good idea to save those prints with which you are not satisfied. On the back mark the filtration and exposure time with which they were made and compare them to your final prints. This is the best method of learning the effects of changing filtration (and exposure) on your Dichro 45S Colorhead.

## V. BLACK AND WHITE PRINTING

The Dichro 45S may be used for black and white printing in either the Condenser (optional) or Diffusion mode. Because of the nature of the black and white negative, a condenser system provides higher contrast and more apparent definition. However, where dust and scratches may be a problem, or for negatives that have been retouched, a diffusion system will produce cleaner looking prints and minimize the necessity for spotting.

It is generally desirable to set all filtration dials to get readouts as close as possible to "000" during black and white printing. When printing with variable contrast papers, the colorhead can be used to control contrast, without the need of an additional set of filters. The tables below show what filtration settings will approximate various paper grades on Agfa Multicontrast, Ilford Multigrade, and Kodak Polycontrast papers.

Paper Grade	Multicontrast Filtration	Multigrade Filtration	Polycontrast Filtration
0	80Y	80Y	75Y
1/2	70Y	55Y	50Y
1	65Y	30Y	25Y
1 1/2	50Y	15Y	10Y
2	30Y	0	10M
2 1/2	15Y	25M	25M
3	20M	40M	40M
3 1/2	30M	65M	55M
4	45M	100M	70M
4 1/2	70M	150M	120M
5	130M	200M	170M

## VI. MAINTENANCE

The Dichro 45S requires virtually no regular maintenance, other than to be kept free of dust when not in use. The only maintenance procedure is to change the lamp when it burns out.

### Lamp Changing Procedure (Beseler Catalog No. 8108)

1. Allow the lamp to cool prior to attempting to change it.
2. Disconnect the power cord as a safety precaution.
3. Open the access door on top of the colorhead by turning the latches 90° (see Fig. 5).
4. Locate the lamp compartment and lift up door (Fig. 2, item 16).
5. Pull lamp ejector (item 18) to right and remove old lamp. See Fig. 6.
6. Insert new lamp firmly into socket until pins are fully seated. Close lamp door; close and lock access door.

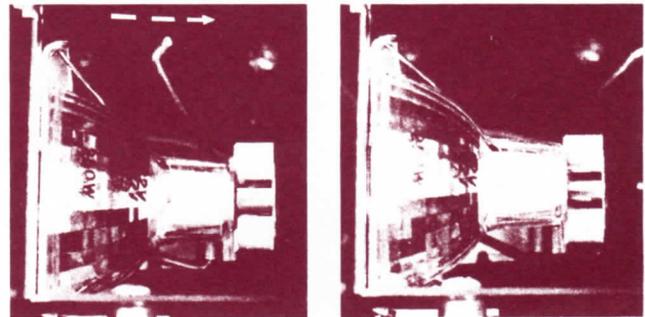


Figure 6

## ACCESSORIES

### pm2A COLOR ANALYZER

Beseler's newest color analyzer combines several of the most popular features from our line of high quality analyzers. The pm2A provides direct readout of filtration and exposure on a large illuminated 4 1/8" meter. An ultra-sensitive photo multiplier probe assures you of accurate readings in the lowest light situations yet can't be damaged by white (room) light due to an automatic safety overload circuit. Coarse and fine adjustment knobs allow highly accurate panel programming while an infinite number of programs can be stored very easily via accessory "plug-in" program modules. Completely solid state with internal voltage stabilization. 12 month warranty. Includes integrator.



### Color by Beseler

Beseler offers a wide range of processing equipment and chemistry for making beautiful prints. Processing drums capable of handling prints up to 16" x 20", motorized agitator, tanks, reels and other helpful tools are available from your Beseler dealer. With Color by Beseler 2-Step or RA-4 chemicals, you can produce fantastic color prints from negatives in as little as two minutes! Develop your color negatives with CN2. Process slides with E6, and make prints from those slides with 3-Step.



## LIMITED ONE YEAR WARRANTY

(Applicable in U.S.A., outside U.S.A. see local distributor)

Charles Beseler Company warrants its products (with the exception of lamps), to the original purchaser only, to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase.

This Warranty does not apply to our products which show evidence of accidental damage, misuse or abuse by you. The Warranty also does not apply to our products which are defective or damaged by tampering or attempted repair by an unauthorized Beseler agent.

Beseler exclusively limits this Warranty to repair or replace (at Beseler's option) the defective part of its product. If you decide to send our product to our authorized repair outlet, you must insure the product and prepay all transportation expenses. Beseler will not be liable for damages caused in the course of shipping the product to you. You must allow at least six (6) weeks for correction of the defect.

ANY IMPLIED WARRANTIES OF FITNESS FOR USE, OR MERCHANTABILITY, THAT MAY BE CREATED BY OPERATION OF LAW ARE LIMITED TO THE ONE (1) YEAR WARRANTY PERIOD.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

NO LIABILITY IS ASSUMED FOR EXPENSES OR DAMAGES RESULTING FROM INTERRUPTION IN

OPERATION OF EQUIPMENT, DAMAGE TO FILM OR PAPER, OR FOR INCIDENTAL, DIRECT OR CONSEQUENTIAL DAMAGES OF ANY NATURE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

In the event there is any defect in materials and workmanship of our product you may contact our Customer Service Department at Charles Beseler Company, 1600 Lower Road, Linden, N.J. 07036. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state. You may also have implied warranty rights. In the event of a problem with warranty service or performance, you may be able to go to a Small Claims Court, a State Court, or a Federal District Court.

### IMPORTANT:

THIS WARRANTY SHALL NOT BE VALID AND BESELER SHALL NOT BE BOUND BY THIS WARRANTY IF OUR PRODUCT IS NOT OPERATED IN ACCORDANCE WITH BESELER'S WRITTEN INSTRUCTIONS.

You must prove the date of purchase by producing a sales receipt indicating that you are the original purchaser.

**IMPORTANT! KEEP THIS INFORMATION HANDY  
FOR FUTURE REFERENCE  
KEEP YOUR SALES RECEIPT!**

### SERVICE INFORMATION:

(Applicable in U.S.A., Outside U.S.A. See Local Distributor)

Should you need service for your BESELER photographic equipment after the warranty has expired, please follow these steps:

**PACK** the product in the original packaging material to protect it in transit.

**ENCLOSE** complete information showing your name and address, what is wrong with the equipment, and the return shipping address. Tape the information to the equipment to be sure it does not get thrown out with the packing material.

**ADDRESS** the package to BESELER SERVICE MANAGER, 1600 Lower Road, Linden, N.J. 07036.

**PREPAY FREIGHT CHARGE AND INSURE** the package against damage or loss in transit.

**ESTIMATES.** We will gladly provide estimates upon request. There is a flat estimate charge of \$25.00 payable in advance. The estimate charge will be credited towards the cost off the repair. No work will be undertaken or billed until written approval of the estimate is received.

**CHARGES.** Your local Beseler dealer has a list of current price ranges to service Beseler photographic equipment. Any repair likely to exceed the maximum recommended service price will be estimated and held for your approval before work is begun.

**PAYMENT.** Your check for \$25.00 must accompany your request for an estimate, alternatively, you may charge your VISA or MASTER CHARGE account. Repairs must be paid in full prior to return to owner. Personal checks or VISA/MASTER CHARGE accepted. (If you pay by VISA or MASTER CHARGE, please give the account number and expiration date.)

**OBSOLETE EQUIPMENT.** Beseler reserves the right to refuse to repair equipment that has been discontinued for five (5) years.

**IN-WARRANTY SERVICE.** There is no charge for service performed during the warranty period. **PROOF OF PURCHASE** is required for warranty service and must be enclosed with the return. Terms of the warranty are explained above.



Charles Beseler Company  
1600 Lower Road, Linden, N.J. 07036