

REPRONAR AND FILMS

A Paper

Presented to the Art Faculty
of the Graduate School
University of Minnesota

Written in Support of a Studio
Project in the Field of
Photography

A Requirement for the Degree
Master of Arts
In Studio Art

by

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PREFACE

I took two cameras and three types of film to Europe. The Minolta had an automatic 1.7 lens. The Nikkormat had an adjustable 1.4 lens plus attaching telephoto and wide-angle lenses. Inevitably I would not have the films in the cameras as I would have wanted them. Therefore, I ended up having as colored slides (positives) the photos that I needed or wanted as black and white negatives.

After a little research I found that there is a machine that can be used to solve this dilemma; it is a repronar. This is a copy machine and the only literature I could find about it was the descriptive booklet furnished with the machine by Honeywell. The machines cost in the neighborhood of \$400.00 and as far as I could ascertain are not too readily available. I was lucky because we had one available to us in the school in which I taught.

My first need was to get black and white negatives from my colored slides. From these negatives I then made some enlargements which I used as illustrations in a book. I also enlarged some of them into photo-murals, made from them some illustrative teaching materials, used them for further creative photography projects, and for some comparison studies.

Having copied the slides onto Ilford FP4 film piqued my interest to copy the same slides onto other films. I then used High Contrast Copy Film 5069, and Kodalith, Ortho film, type 3, and from the negatives thus obtained made some enlargements for further comparisons.

There were no available charts for determining film values so it was by trial and error I was able to work out values for the films with which I was involved. This information is herein included.

After obtaining some interesting results from the negatives obtained by copying slides I wondered what results could be obtained by shooting the Kodalith film in a camera, so I made some further studies with the Kodalith film. I found it to be a highly unpredictable film when used in the camera. However, some interesting and creative results were obtained.

The repronar proved to be a valuable machine both as a technical device and as a creative tool.

THE REPRONAR

The Repronar is a sophisticated transparency copier which consists of a lens, a copy area, and a flash, on a steady base.

The lens is in the form of a mounted camera which has a long bellows so that the body of the camera and the lens can travel up and down the mounting independently. This facilitates copying all of the slide, or just a portion of it.

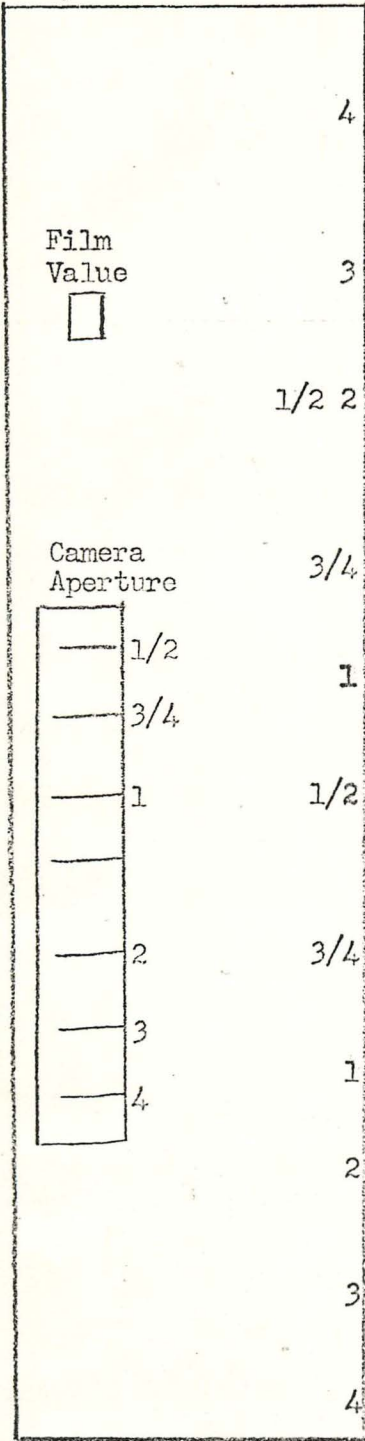
The copy area and the flash are mounted in the base. There is a rectangular window with a slide holder in the base. The light is under this. The repronar can be set so the light shows upward through the slide making it possible to view just what it is going to copy, or it can be set so that the light flashes through the slide into the camera lens, thus copying the slide onto the film in the camera.

The Appendix pages describe the Honeywell, Repronar 805 in detail.

The exposure calculator, attached to the machine, indicates working magnification and proper exposure with various films. It consists of three main parts: film index window which shows the choice of film index; camera aperture bar which gives correct aperture for various amounts of magnification; and magnification scales, the lower used as reference points for the lens carriage pointer and the upper used as reference points for the upper pointer attached to the camera carriage.

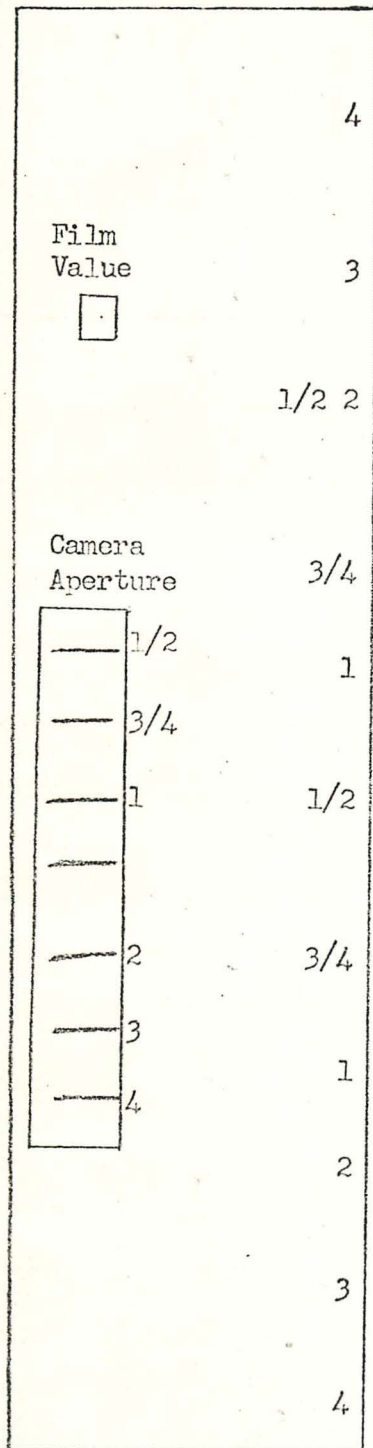
The following diagrams and charts explain the function and use of the exposure calculator.

Exposure Calculator



The numbers along the right hand side indicate the degree of magnification. The camera body travels upward on its mount and aligns with the numbers in the upper portion. The lens travels downward on its mount and aligns with the numbers in the lower portion. For proper focus, the camera body and the lens must be aligned with corresponding numbers. If, for instance they are both aligned with numbers 1, the entire transparency would be reproduced; if with numbers 2, one-half of the transparency would be reproduced; with numbers 4, only a small portion of the transparency would be reproduced. This is a handy feature because an enlargement of a specific area can be obtained by copying only a small portion of an entire transparency. If, for example, there was a number of art objects which had been photographed at one time, by copying portions of the transparency, one could obtain enlargements of individual items liberated from extraneous surrounding objects.

Exposure Calculator



The numbers which appear in the windows on the left hand side of the exposure calculator indicate the working magnification and the proper exposure with various films. Knowing the ASA of the film in the camera, and using a chart, one can ascertain the assigned film value. This film index number is then set into the film value window by means of the selector knob. As this is done, the correct aperture settings rotate in the camera aperture window. After determining the proper aperture setting for the desired magnification, the camera lens should then be set. The following is a chart of some representative aperture settings for some indicated film indexes.

Magnification	Film Index			
	20	6	4	3
1/2	Aperture Settings 8			
3/4	22		5.6	5.6
1		5.6		4
2	16			
3		4		
4	11			

FILM INDEX CHART

Type of Film	ASA	Electronic Flash Position	Film Index
CPS	100	Low	9
Ilford FP4	125	Low	20
Plus X	125	Low	20
Ektachrome	64	Low	20
High Speed Ektachrome	160	Low	20
High Contrast Copy Film 5069	64	Low	20
Kodalith Ortho Film Type 3	6	High	3

Having Ilford FP4 film, ASA 125, loaded into the repronar camera, looking on the chart the film index indicated would be 20, and wanting to copy the whole slide - that is 1 to 1 - the reading on the exposure calculator would indicate setting the camera aperture on the dot which appears between 16 and 22. From here on, it is simply a matter of placing the slide, or transparency, into the holder and making a flash exposure of it. There is a viewer on the front of the camera so it is possible to regard each slide before doing the exposure. To do so, it is only necessary to turn the ready light switch to the view position and after viewing, it is necessary to move it back to the flash position, at which point the repronar is ready for copying - the view light is off and the electronic flash is ready to be fired.

As indicated by the chart, the same film index would be used for High Contrast Copy film 5069.

COPIES MADE BY USING ILFORD FP4 FILM AND HIGH CONTRAST COPY FILM
IN THE REPRONAR, AND ENLARGEMENTS MADE FROM THE NEGATIVES THUS
OBTAINED IN ORDER TO DRAW SOME COMPARISONS.

Page 8 - Contact sheet of copies made with the repronar onto
Ilford FP4 film ASA 125, from Ektachrome slides.

Page 9 - Contact sheet of copies made with the repronar onto
High Contrast Copy film 5069 from Ektachrome slides.

Comparisons can be made between the use of the two films and also
the different results obtained regarding the lack of greys in some
cases.



1A 10



10A 11



11A 12



12A 13

FORD



63 7



7A 8



8A 9



9A 14



14A 15



34A 35



35A 36



36A 37



37A 38



40A 21



20A 28



29A 30



30A 31



31A 32

IFORD



22A 23



23A 24



24A 25



26A 26



26A 27

IFORD



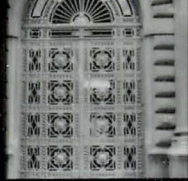
1A 2



2A 3



1A 2



1A 2



2A 3

IFORD



1A 2



1A 2



1A 2



1A 2



1A 2



KODAK SAFETY

KODAK SAFETY

SAFE

G K G A

KODAK SAFETY & FILM

OA

1

1A

2 3A

KODAK SAFETY & FILM

KODA

The following two enlargements show some interesting developments which take place when copying onto the two different kinds of film.

The photograph on page 11 is the one which was made from the Ilford FP4, ASA 125, negative. It is a tonal photograph in that it runs all the way from white to black, with many shades of grey in between.

The photograph on page 12 is one made from the High Contrast Copy film negative. There is a sharp contrast between the blacks and whites, with many of the greys eliminated.

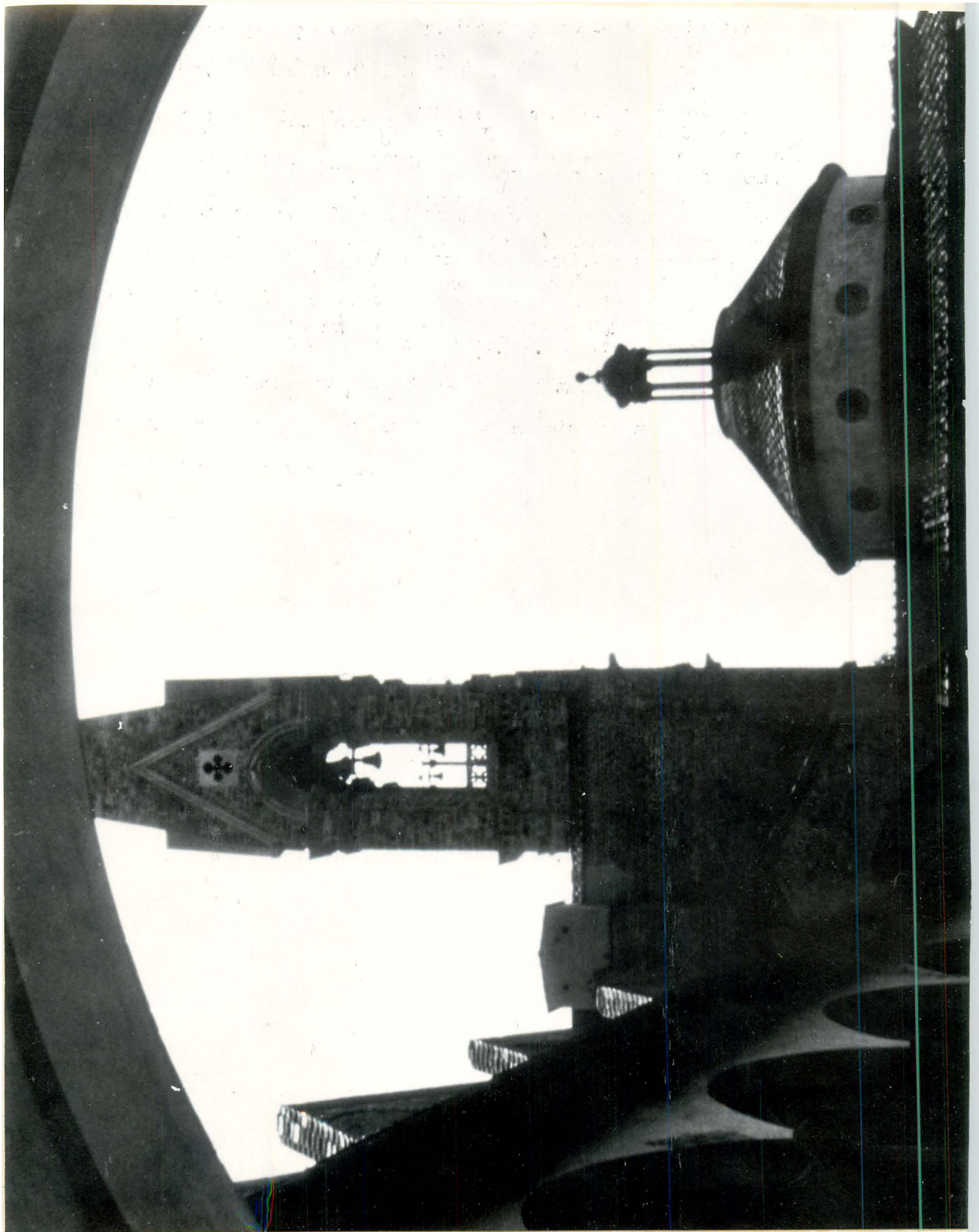
What happened to the texture of the pavement is especially interesting, as is the resultant elimination of facial features, and the loss of greys in the background buildings.

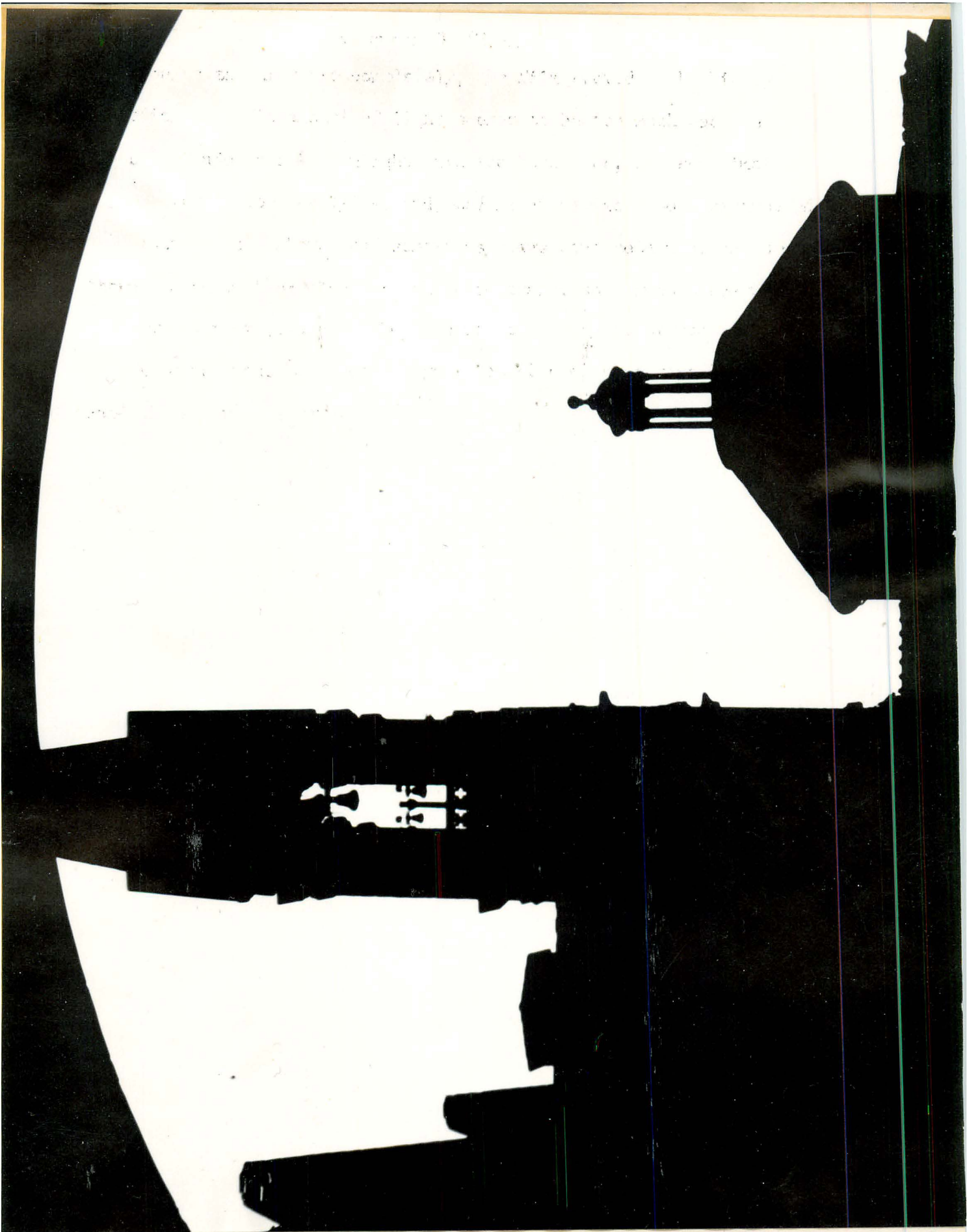
There is a vast difference in what happens with different slides as illustrated by the photographs on pages 13 and 14. In the Ilford FP4 print which occurs on page 13, there is a range of greys, plus the sharp blacks and whites. The photograph on page 14 made from the High Contrast Copy film negative has become a silhouette. In this case, the High Contrast Copy film has produced a result like that usually obtained with kodalith film.

Using the same film value, and the same aperture setting, different results are obtained from different negatives, even though there are several tones of grey in the Ilford FP4 negatives obtained from the corresponding slides.









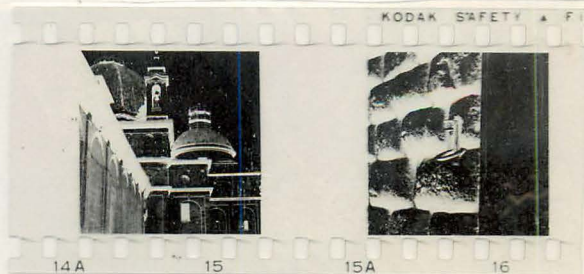
Faint, illegible text is visible in the upper portion of the image, appearing as light gray markings on a white background. The text is too faded to be transcribed accurately.

Kodak High Contrast Copy film 5069 is a high-contrast panchromatic film designed for making reduced copy negatives of printed matter, engineering drawings, maps, etc. It provides high sharpness, even when negatives are enlarged to extremely high magnifications. Some people copy their negatives onto this film for mural making. Murals of at least three feet by four feet maintain their sharpness very well.

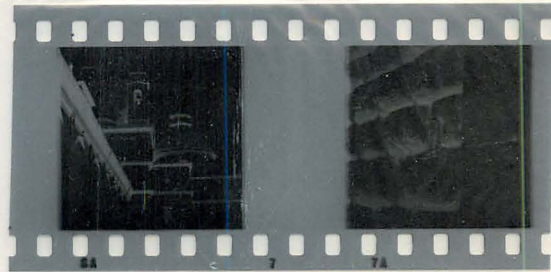
This film has a clear base, so the negatives appear thinner than those made under the same conditions on grey-base films.

Comparative Negatives

High Contrast Copy film



Ilford FP4 film



The ASA on the High Contrast Copy film is 64, and on the Ilford FP4 the ASA is 125. The chart will indicate that when using either film for copying with the repronar the film index is 20.

KODALITH, ORTHO FILM, TYPE 3

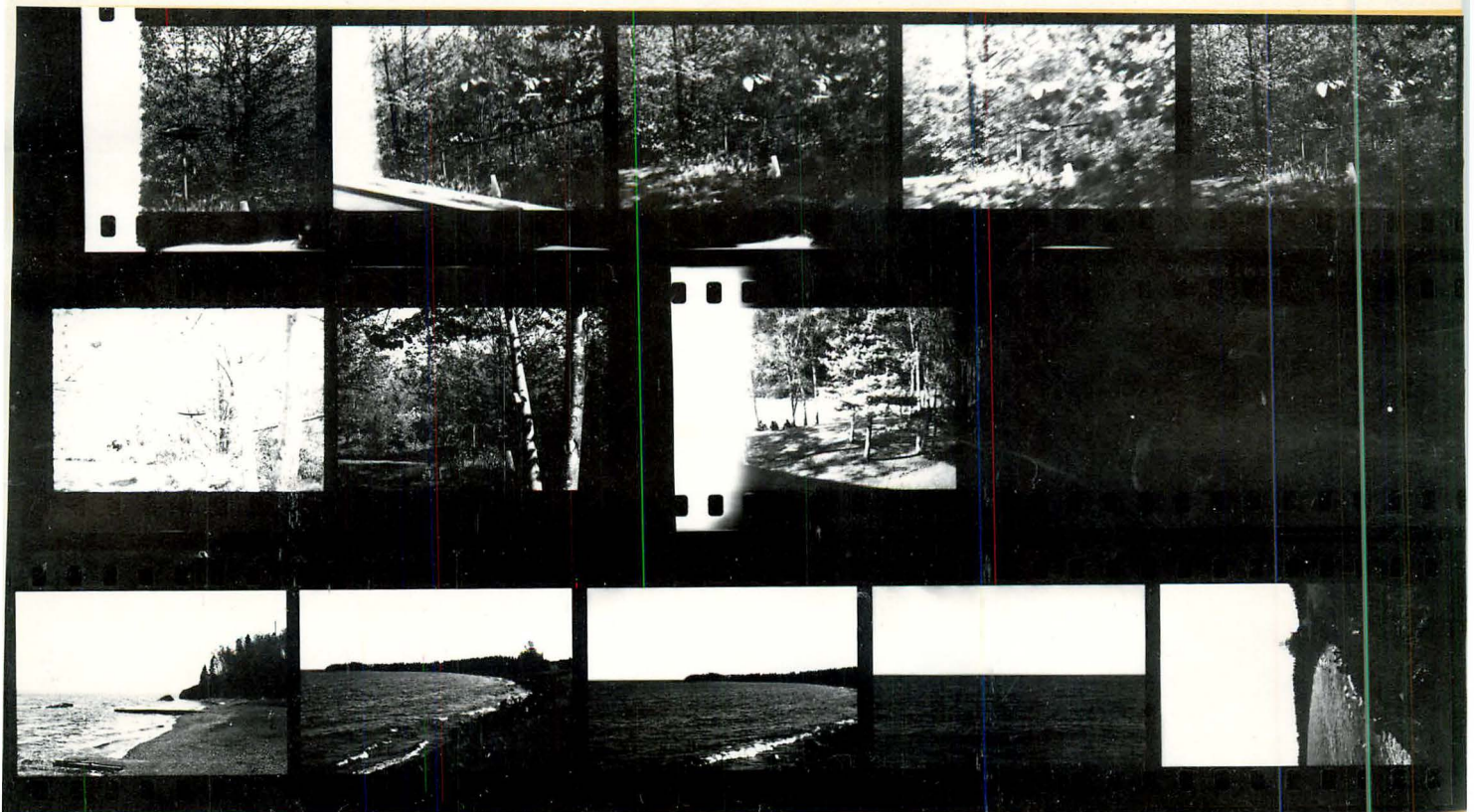
Kodalith, Ortho film, type 3 used in the repronar to copy the same negatives produced some comparative results. When using film index 4 with the electronic flash set on low the results obtained were comparable to the results obtained with the High Contrast Copy film as illustrated in the photograph on page 12: sharp blacks and whites with some greys. When using a film index of 3 and setting the electronic flash on high the results were comparable to the results obtained with the High Contrast Copy film as illustrated on page 14: greys being eliminated. When set on high the flash unit of the repronar will deliver four times as much light as when set on the low position.

Kodalith is an extremely high contrast, orthochromatic film. Besides the creative photography uses, it is used extensively in photographic silkscreen.

Some creative things can be done in the repronar with a kodalith negative. Select some simple shot such as a single object without much background, then add an acetate filter, expose; move slightly, add a different filter, expose; repeat as often as desired. Prints from an ektachrome slide thus obtained can produce some very creative results.

The ASA on Kodalith is 6 and cameras with a setting this low are not readily obtainable. A camera with an ASA setting of 12 is fairly common. When using this higher ASA, disregarding the exposure meter

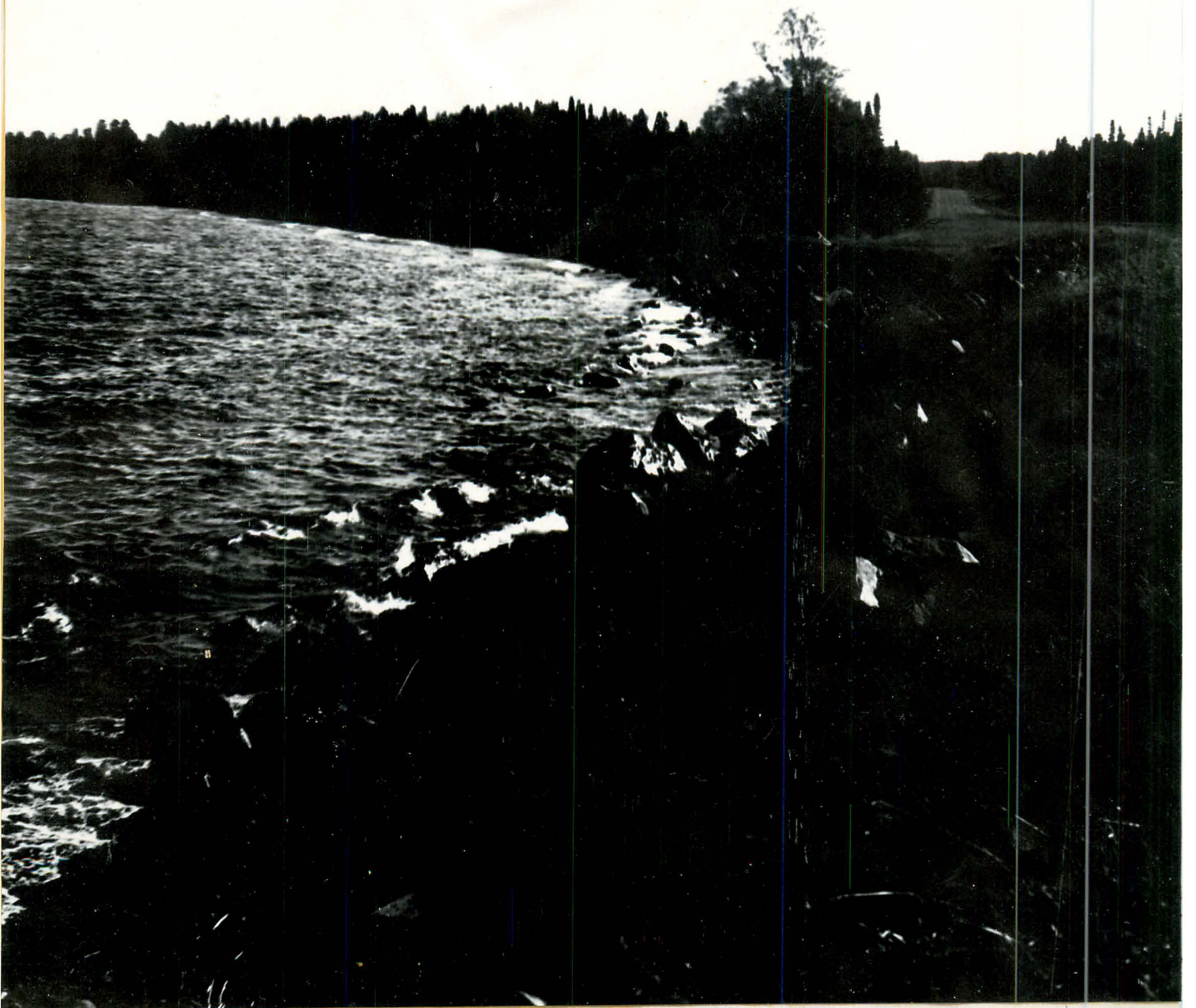
and opening the aperture completely, the film proved to be highly unpredictable. No amount of light seemed to be too much because the shots made in full sunlight with the lens open, and sometimes exposed for as long as 1/8 second, the negatives were not overexposed. The contact sheet shows that sometimes greys were retained, sometimes there was only sharp black and white contrast, sometimes there was a sharp and a fuzzy image on the same negative, and sometimes nothing at all registered. The results were not stable, even when the conditions were the same.



Sharp blacks and whites, greys retained.



Sharp blacks and whites.



Sharp and fuzzy image registered on same negative.



Kodalith negative exposed onto A-2 paper. The image was exposed onto the front of the paper for 1 second and then the paper was turned over and the image was exposed onto the paper for $1\frac{1}{2}$ seconds. The greys, as well as the reverse image, have been created in this way. A-2 paper is a very fast paper, thus the extremely short exposure time.



WAYS I USED THE REPRONAR AND VARIOUS FILMS

I had many uses for the negatives obtained by copying ektachrome slides onto different types of film.

Some of the telephoto and wide-angle shots of the Gothic cathedrals were copied onto Ilford FP4 film, enlarged, and used for illustrations in an extensive writing project. For printing these I used A-2 paper: smooth, lustre on a white, light-weight base. This paper is thin enough for the illustrative pages in a report or manual. It folds without cracking.

Sample of A-2 paper



Other uses I had for these negatives was simply to make some prints that I wanted for teaching different types of compositions to photography students; for making murals; for other types of creative photography projects; and for making comparisons of results obtained with different types of film.

Kodalith proved to be an interesting film which was usable in many ways. I did a series of texture screens by first copying some textures from a book with a copy stand and camera onto Ilford FP4 film and then putting them onto kodalith, either in 35mm size or in an enlarged size. The screens could then be used in the negative holder or as a contact screen. I made some interesting murals from the kodalith negatives and the kodalith positives; they enlarge with great clarity. Posterization is another process I did with the kodalith. It is also possible to do line photographs by sandwiching a positive and a negative together in the enlarger.

Both the repronar and the kodalith film open up avenues for further exploration.

CONCLUSION

With a device such as the repronar the need for two cameras can be eliminated, as well as the need for taking shots onto black and white film. By use of various films in the repronar it is possible to convert a slide, or other transparency, into some other type of positive or negative.

The repronar can be used to convert ektachrome slides into black and white prints and into murals; to convert slides into illustrations for a book; to produce prints and other types of teaching materials; to enlarge portions of slides in order to have close-ups of certain things; and to experiment with various films and compare the results without having to shoot the same subject several different times onto various films.

Pan X film, ASA 32, can be used to copy an article from the newspaper, then this negative can be copied with the repronar to obtain a positive slide. Color could be added by marking on the negative, or by adding acetate filters.

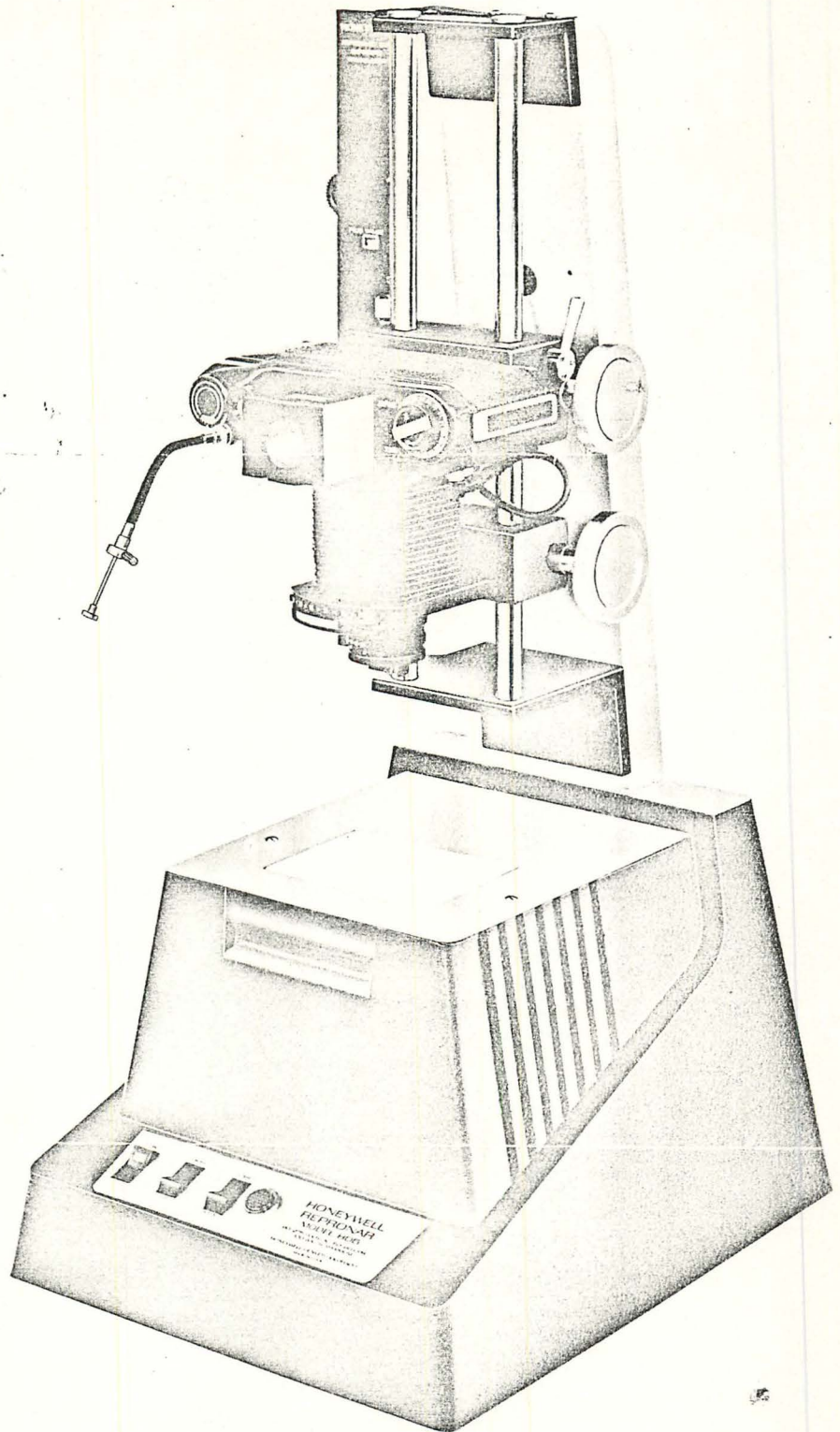
A tri-X negative can be copied to get a black and white tri-X slide. A black and white slide thus obtained could be copied with an acetate filter added between the slide and the lens to get another slide but with color added.

Probably the most common use for the repronar would be to copy a slide onto ektachrome film to obtain another slide like the one

being copied. The slide could be copied, but its shape changed if desired by placing a cardboard blockout between the slide and the lens.

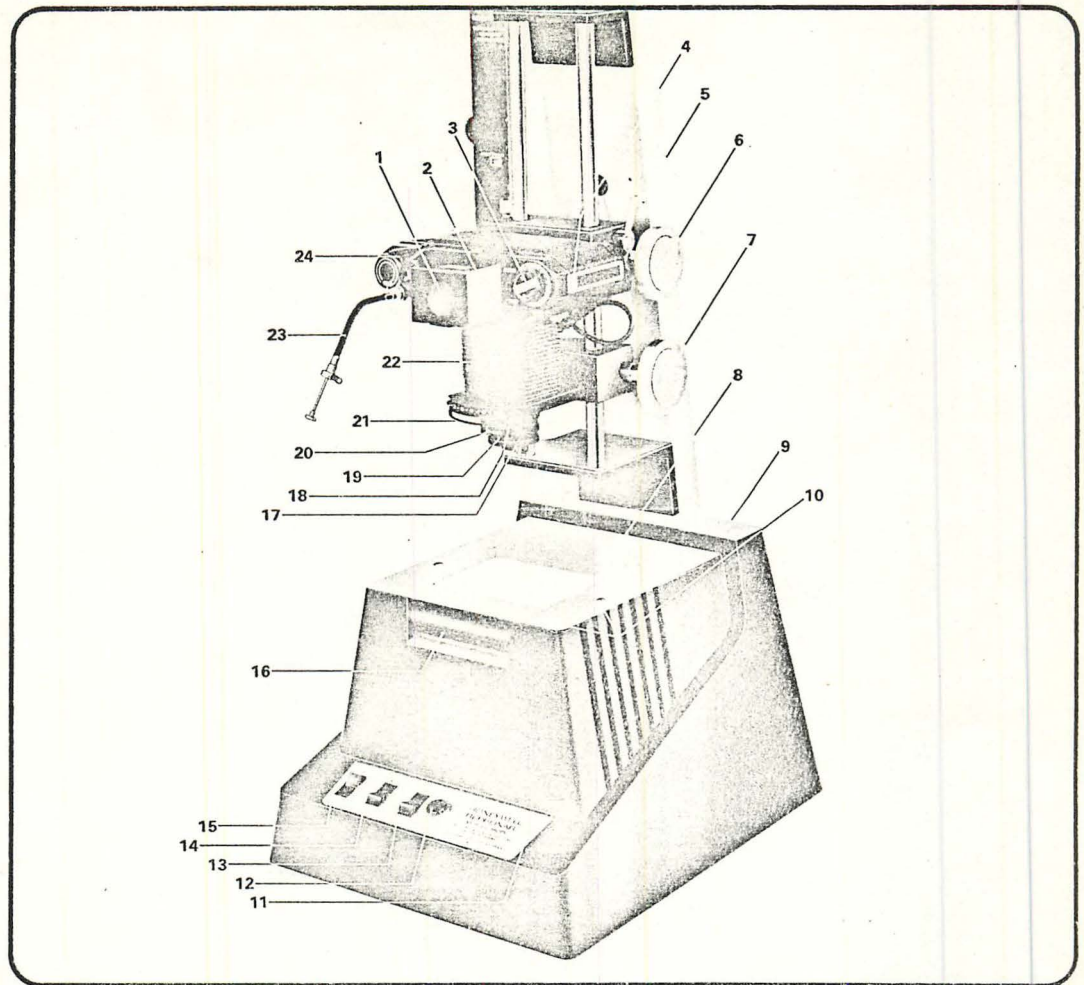
A repronar has its limitations, but there are several possibilities which make it a useful and creative tool.

NOMENCLATURE

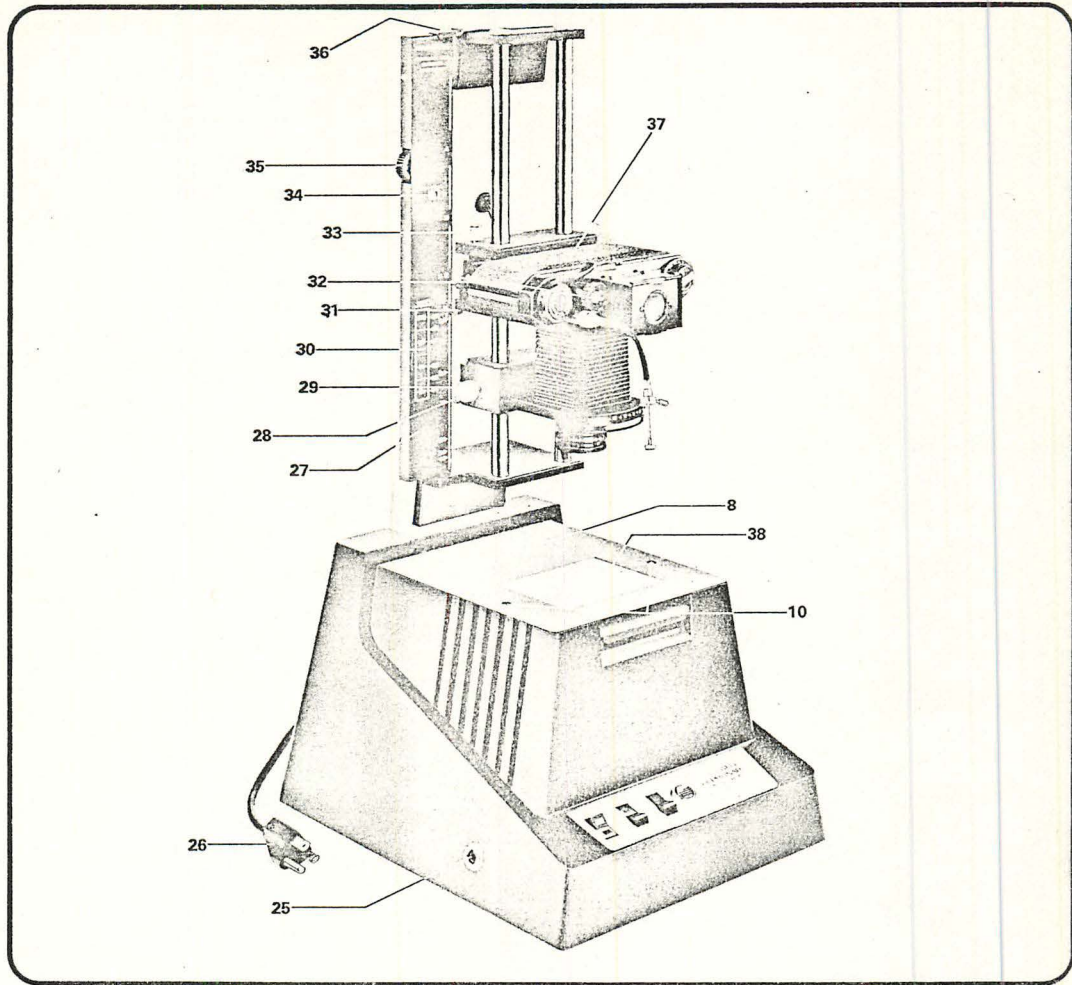


HONEYWELL REPRONAR

MODEL 805



- 1—MAGNIFIER—Enlarges a portion of the image for sharpest focusing. Swings out of the way for normal viewing.
- 2—VIEWER—Provides an accurate, full-sized image on hooded ground glass for composing and focusing.
- 3—CRANK FOR REWIND—Crank unfolds for ease of rewinding film into cassette.
- 4—CAMERA CASE LATCH—Secures the removable camera back.
- 5—CAMERA CARRIAGE LOCKING LEVER—Locks the camera carriage in final position after final focusing. Provides one-hand operating ease.
- 6—CAMERA TRAVEL KNOB—Moves the camera on a helical gear and rack mechanism for easy focusing.
- 7—LENS CARRIAGE TRAVEL KNOB—Large, easy to grasp knob provides quick and positive positioning of lens carriage.
- 8—WORK TABLE (EASEL)—Provides level work area of steel for smooth positioning. Easy to keep clean.
- 9—BASE—Cast metal housing for electronic flash light source. Design and finish both pleasing and functional.
- 10—THREADED HOLES—Drilled and tapped for 8/32 slide holder thumb screws.
- 11—NAMEPLATE AND CONTROL PANEL—Gives unit identification and directions for proper switch positioning.
- 12—READY LIGHT—Glowes when the FLASH-VIEW switch is in the flash position, indicating that the Repronar is ready for copying—the view light is off, and the electronic flash is ready to be fired.
- 13—FLASH-VIEW SWITCH—In flash position, the switch completes the circuit for firing the electronic flash with the camera shutter release; in view position, the switch turns on the view light for illuminating the transparency.
- 14—HIGH-LOW SWITCH—Controls power output of electronic flash. When in the HIGH position the unit will deliver four times (two *f/stops*) the amount of light as when in the LOW position. The power output in the LOW position is the same as the previous models of the Repronar.
- 15—ON-OFF SWITCH—Functions as the master switch for the Repronar. The view light and electronic flash operate only when this switch is in the ON position.
- 16—FILTER COMPARTMENT AND HOLDER—Filter holder slides in and out of the filter compartment easily, allowing insertion of filter without disturbing copy or opal view glass.
- 17—LENS CAP—Protects lens when not in use.
- 18—APERTURE SELECTOR—Controls the action of the lens diaphragm. Pointer indicates working aperture which is printed on the Aperture Index Scale.
- 19—*f/STOP* MARK—Indicates proper positioning of the diaphragm ring.
- 20—DIAPHRAGM RING—Rotates (click stops) to pre-select the proper *f/stop*. The Aperture Selector will stop when being moved from right to left, at the position indicated by the Diaphragm Ring.
- 21—APERTURE INDEX SCALE—Serves as an *f/stop* indicating scale for the Aperture Selector. Numbers on the scale represent full *f/stops* with half-stops indicated.
- 22—BELLOWS—Allows freedom of movement between camera body and lens.
- 23—CABLE RELEASE—Operates the shutter and fires electronic flash in synchronization.
- 24—FILM ADVANCE LEVER—Advances film and cocks the shutter in readiness for the next exposure.



8—WORK TABLE (EASEL)—Provides level work area of steel for smooth positioning. Easy to keep clean.

10—THREADED HOLES—Drilled and tapped for 8/32 slide holder thumb screws.

25—MOTOR DRIVE POWER RECEPTACLE—Provides power for operation of the motor drive unit.

26—POWER CORD PLUG—Utilizes newest grounding principle for greatest safety.

27—EXPOSURE CALCULATOR—Indicates working magnification and proper exposure with various films.

28—LENS CARRIAGE POINTER—Indicates on the Exposure Calculator the magnification of the copy and the lens aperture for a normal exposure.

29—LENS CARRIAGE LOCKING SCREW—Locks lens carriage at selected position.

30—APERTURE WINDOW—Shows correct aperture setting for different amounts of magnification.

31—CAMERA CARRIAGE POINTER—Indicates settings to correspond with the lens carriage pointer, providing quick positioning of the camera for approximate focus. From this position, focusing is easily completed while the sharpness of the image is observed on the ground glass.

32—SHUTTER KNOB—Rotates as shutter is cocked (clockwise) and released (counter-clockwise). Acts as selector for "T" and "B" settings.

33—MOTOR DRIVE LOCKING SCREW—Locks motor drive in proper position.

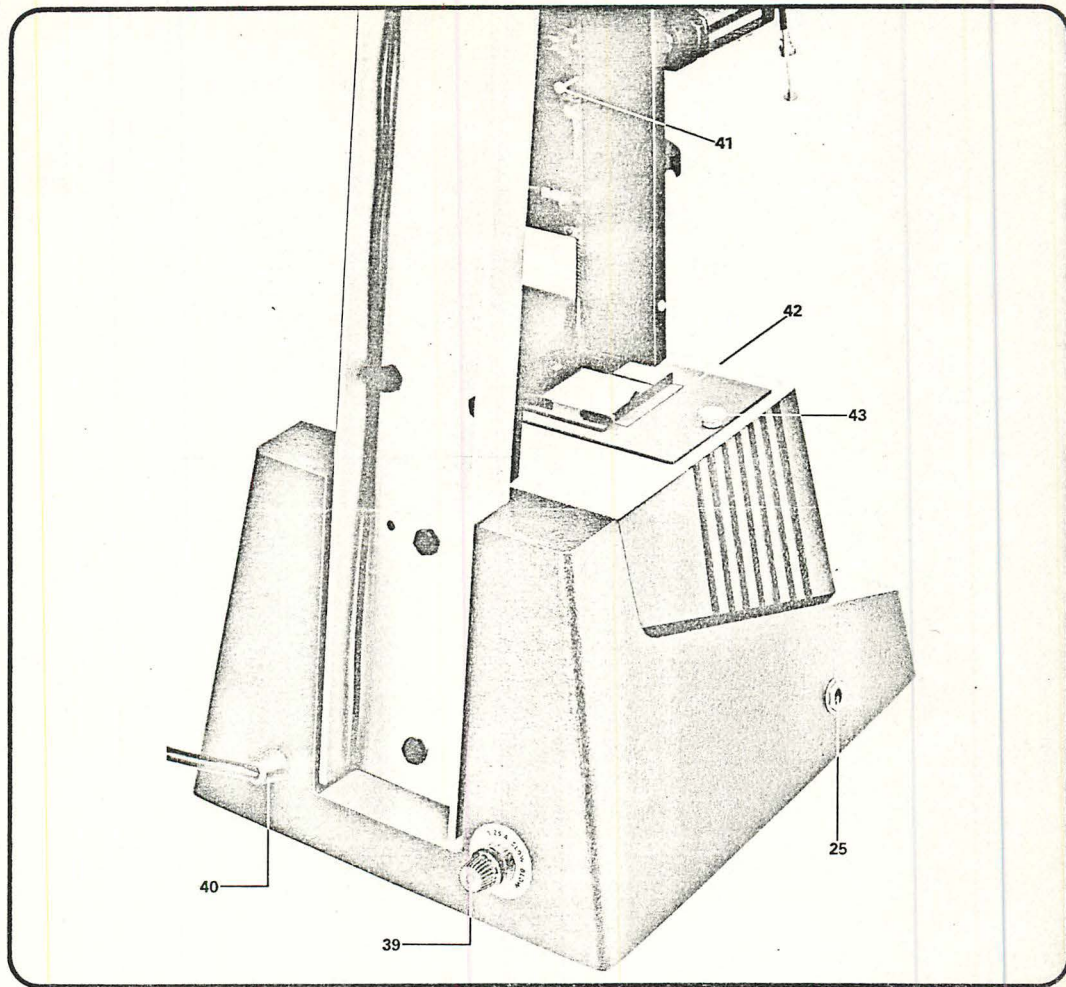
34—FILM INDEX WINDOW—Shows choice of film index.

35—SELECTOR WHEEL—For selecting proper film index.

36—SPRING CLIP—Holds Exposure Calculator in proper position. Allows calculator to be removed and installed easily.

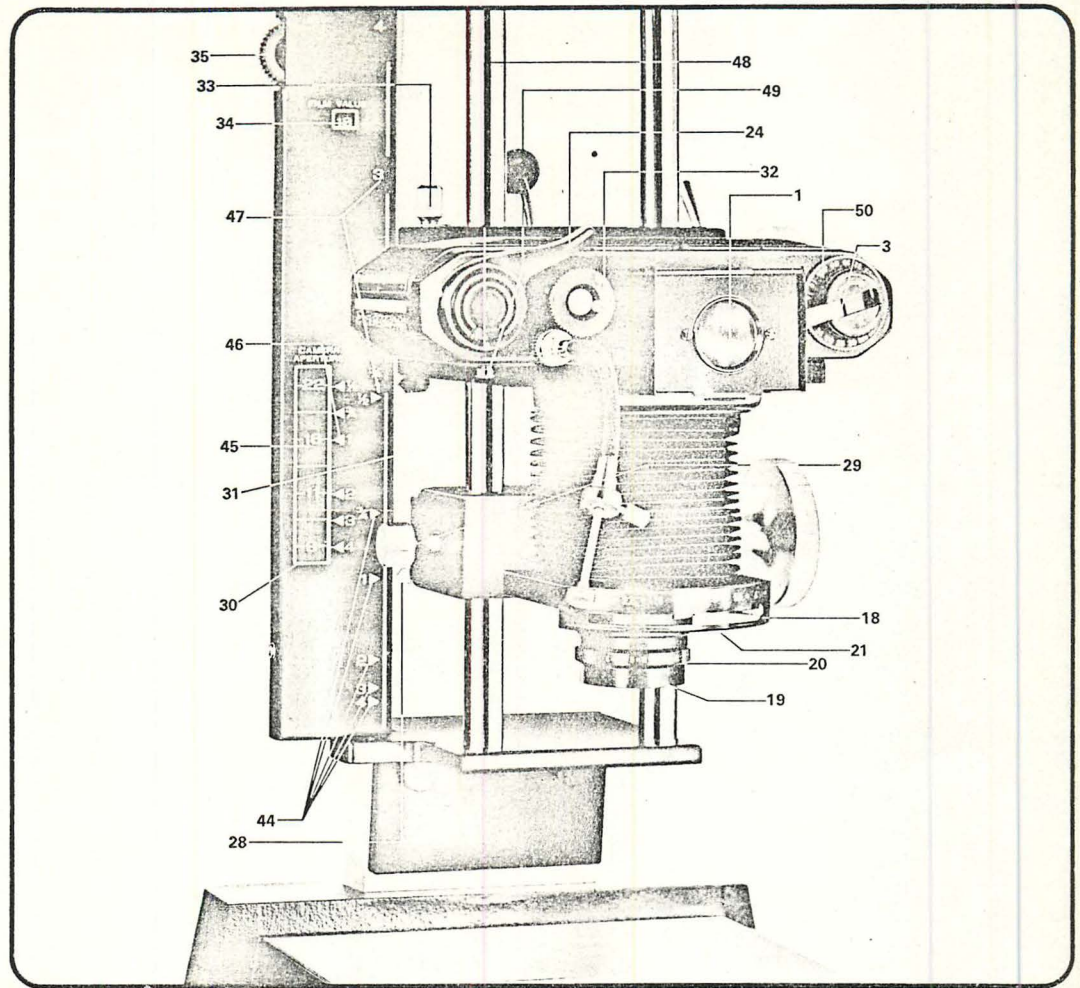
37—CAMERA BACK—Removes completely for loading of film. Complete removal allows use of bulk film back.

38—COPY AREA—Rectangular hole in work table which accepts the opal view glass.

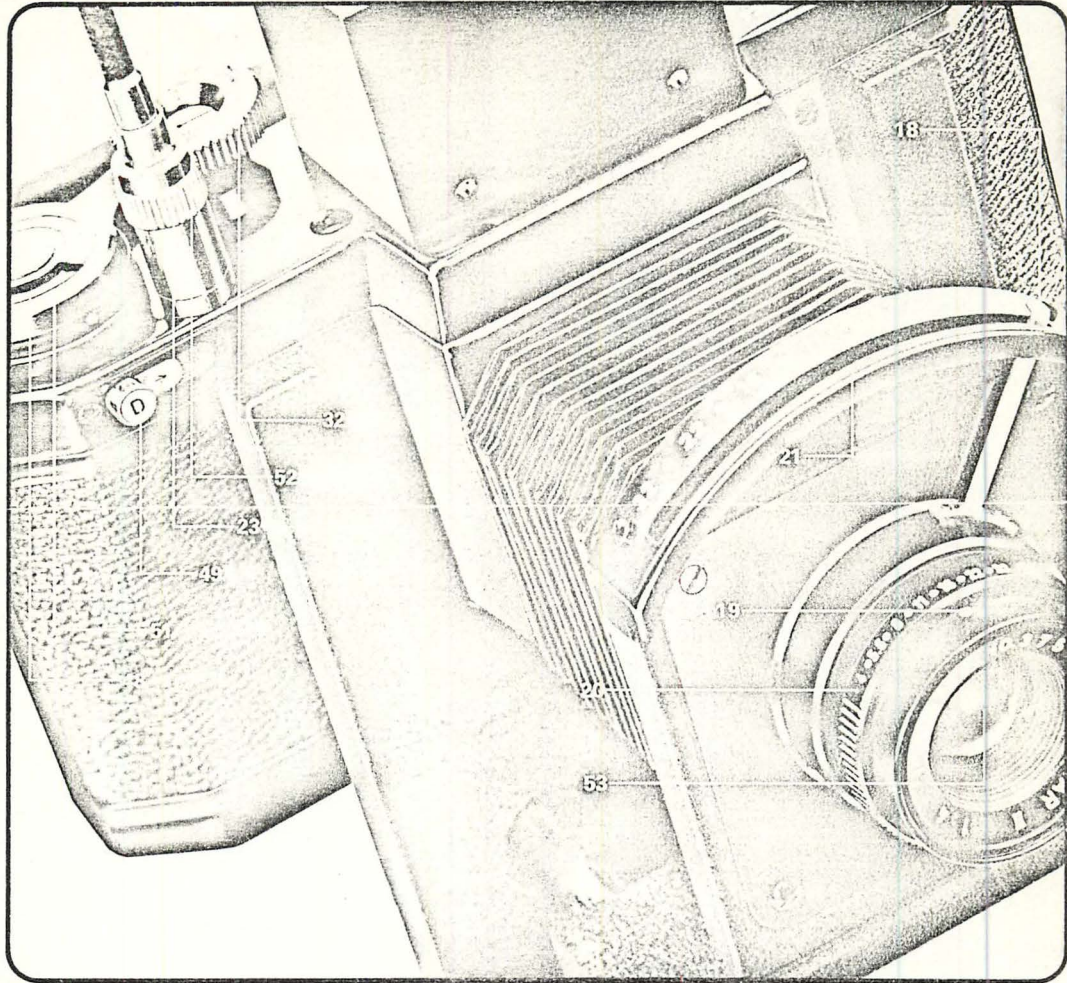


- 25—MOTOR DRIVE POWER RECEPTACLE—Provides power for operation of the motor drive unit.
- 39—FUSE CAP AND HOLDER—Holds the fuse which protects the electrical circuit of the Repronar. Designed for easy replacement.
- 40—AC LINE CORD—Provides power for operation on household current 90-275 VAC 50-60 cps. 100 watts maximum.
- 41—FILM REWIND RELEASE BUTTON—When depressed, permits film rewind crank to rewind film into the cassette.

- 42—SLIDE HOLDER 2-INCH—Holds all 2-inch slides (35mm, 828, and 127 super slides); may be moved freely on the easel, secured in any position with the magnets, or centered and secured in position with thumb screws.
- 43—SLIDE HOLDER THUMB SCREWS—Lock the slide holder in position on the easel for use in reproducing any number of slides without relocating the slide holder.

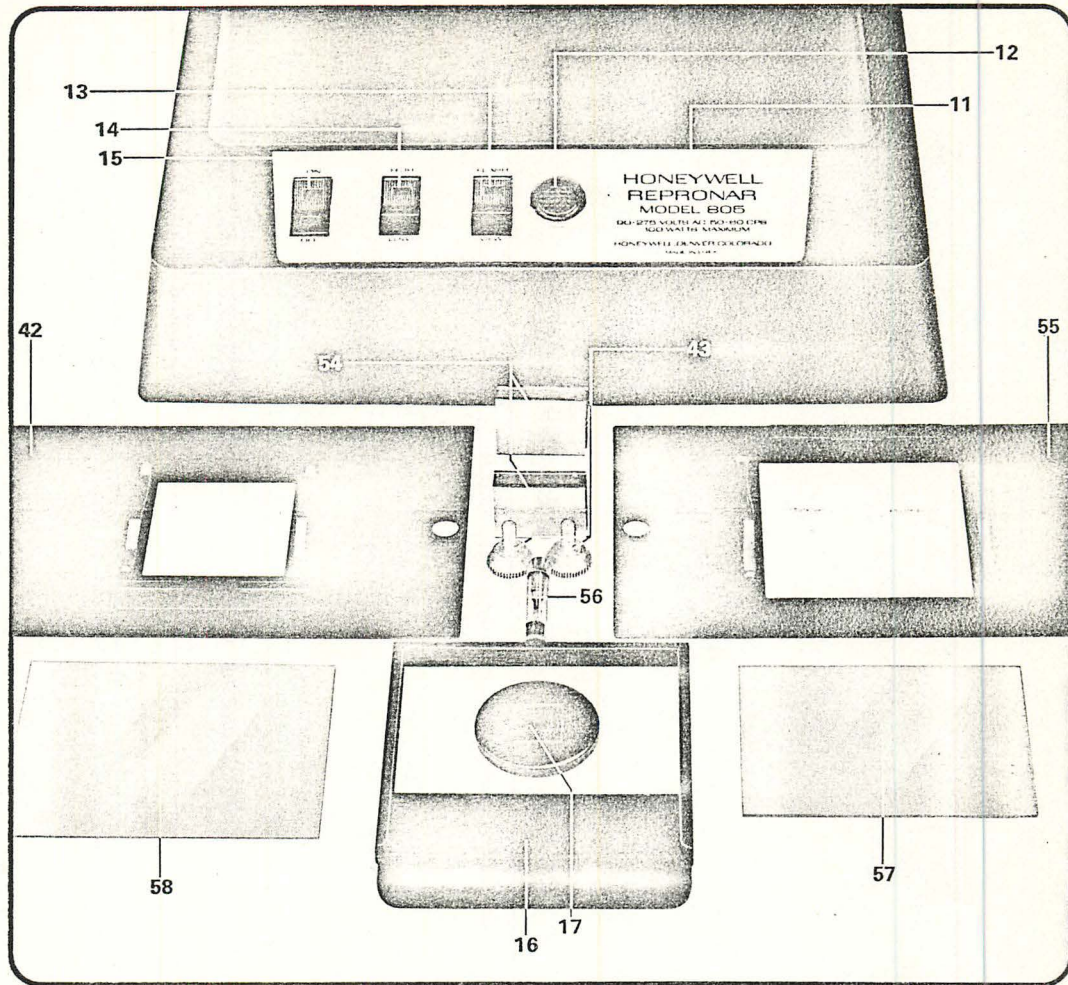


- 1—MAGNIFIER—Enlarges a portion of the image for sharpest focusing. Swings out of the way for normal viewing.
- 3—CRANK FOR REWIND—Crank unfolds for ease of rewinding film into cassette.
- 18—APERTURE SELECTOR—Controls the action of the lens diaphragm. Pointer indicates working aperture which is printed on the Aperture Index Scale.
- 19—f/STOP MARK—Indicates proper positioning of the diaphragm ring.
- 20—DIAPHRAGM RING—Rotates (click stops) to pre-select the proper f/stop. The Aperture Selector will stop when being moved from right to left, at the position indicated by the Diaphragm Ring.
- 21—APERTURE INDEX SCALE—Serves as an f/stop indicating scale for the Aperture Selector. Numbers on the scale represent full f/stops with half-stops indicated.
- 24—FILM ADVANCE LEVER—Advances film and cocks the shutter in readiness for the next exposure.
- 28—LENS CARRIAGE POINTER—Indicates on the Exposure Calculator the magnification of the copy and the lens aperture for a normal exposure.
- 29—LENS CARRIAGE LOCKING SCREW—Locks lens carriage at selected position.
- 30—APERTURE WINDOW—Shows correct aperture setting for different amounts of magnification.
- 31—CAMERA CARRIAGE POINTER—Indicates settings to correspond with the lens carriage pointer, providing quick positioning of the camera for approximate focus. From this position, focusing is easily completed while the sharpness of the image is observed on the ground glass.
- 32—SHUTTER KNOB—Rotates as shutter is cocked (clockwise) and released (counter-clockwise). Acts as selector for "T" and "B" settings.
- 33—MOTOR DRIVE LOCKING SCREW—Locks motor drive in proper position.
- 34—FILM INDEX WINDOW—Shows choice of film index.
- 35—SELECTOR WHEEL—For selecting proper film index.
- 44—MAGNIFICATION SCALE-LOWER—Used as reference points for the Lens Carriage pointer.
- 45—CAMERA APERTURE BAR—Gives correct aperture for various amounts of magnification.
- 46—MAGNIFICATION INDEX FOR APERTURE WINDOW—Used as reference points for exposure selection.
- 47—MAGNIFICATION SCALE-UPPER—Used as reference points for the upper pointer attached to the camera carriage.
- 48—EXPOSURE COUNTER—Shows how many frames have been exposed. Indicates numbers from —2 to 37. Automatically resets to —2 when camera back is released.
- 49—DOUBLE EXPOSURE BUTTON—Allows the shutter to be cocked for multiple exposures without moving the film.
- 50—FILM REMINDER DIAL—May be used as a reminder as to what kind of film is in the camera body.



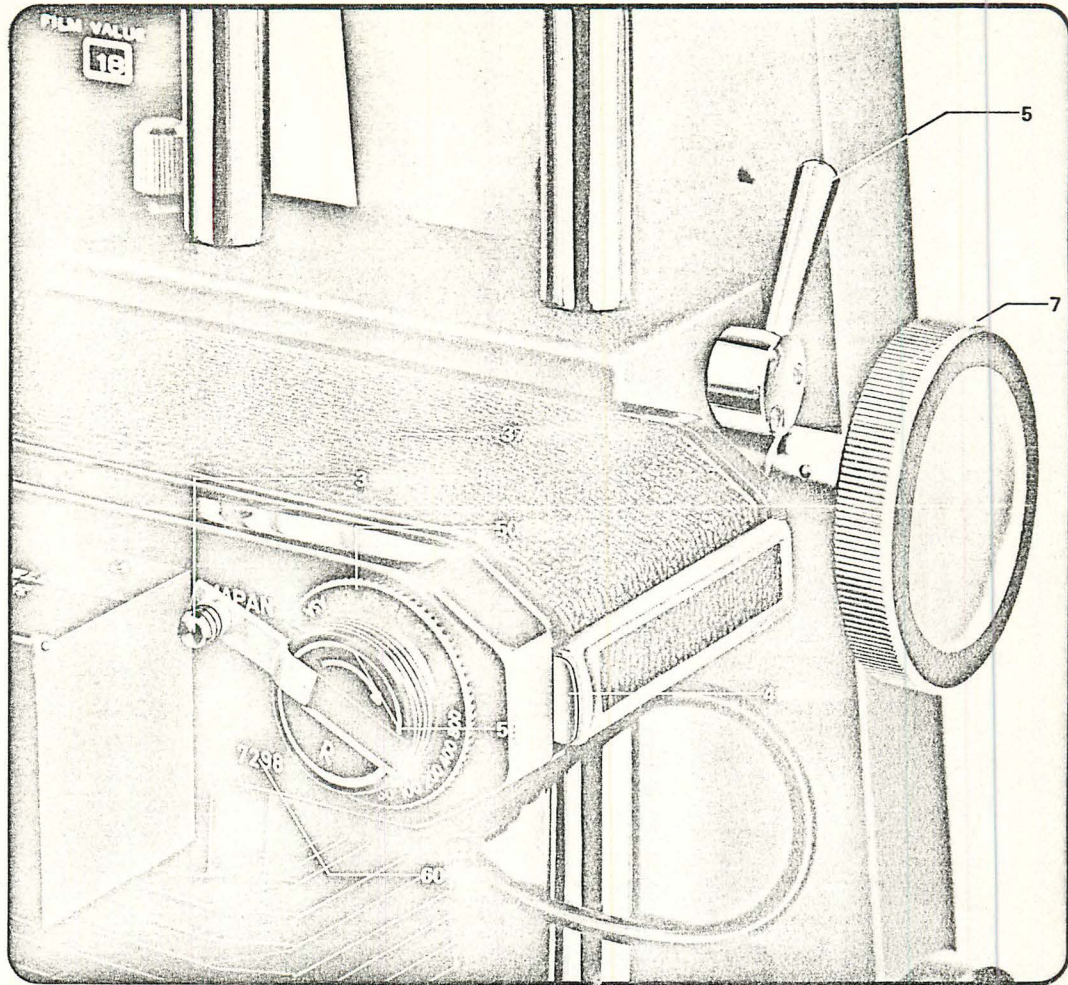
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- 19—f/STOP MARK—Indicates proper positioning of the diaphragm ring.
- 20—DIAPHRAGM RING—Rotates (click stops) to pre-select the proper f/stop. The Aperture Selector will stop when being moved from right to left, at the position indicated by the Diaphragm Ring.
- 21—APERTURE INDEX SCALE—Serves as an f/stop indicating scale for the Aperture Selector. Numbers on the scale represent full f/stops with half-stops indicated.
- 23—CABLE RELEASE—Operates the shutter and fires electronic flash in synchronization.
- 32—SHUTTER KNOB—Rotates as shutter is cocked (clockwise) and released (counter-clockwise). Acts as selector for "T" and "B" settings.

- 48—EXPOSURE COUNTER—Shows how many frames have been exposed. Indicates numbers from —2 to 37. Automatically resets to —2 when camera back is released.
- 49—DOUBLE EXPOSURE BUTTON—Allows the shutter to be cocked for multiple exposures without moving the film.
- 51—EXPOSURE COUNTER INDEX MARK—Used as an index for the exposure counter.
- 52—SHUTTER KNOB INDEX MARK—Used to line up the "T" and "B" settings on the shutter knob.
- 53—LENS—New 50mm f/4 pre-set Repronar II lens. Designed for high efficiency at close working distances. Four element f/4 to f/32 with click stops at half and full stops.



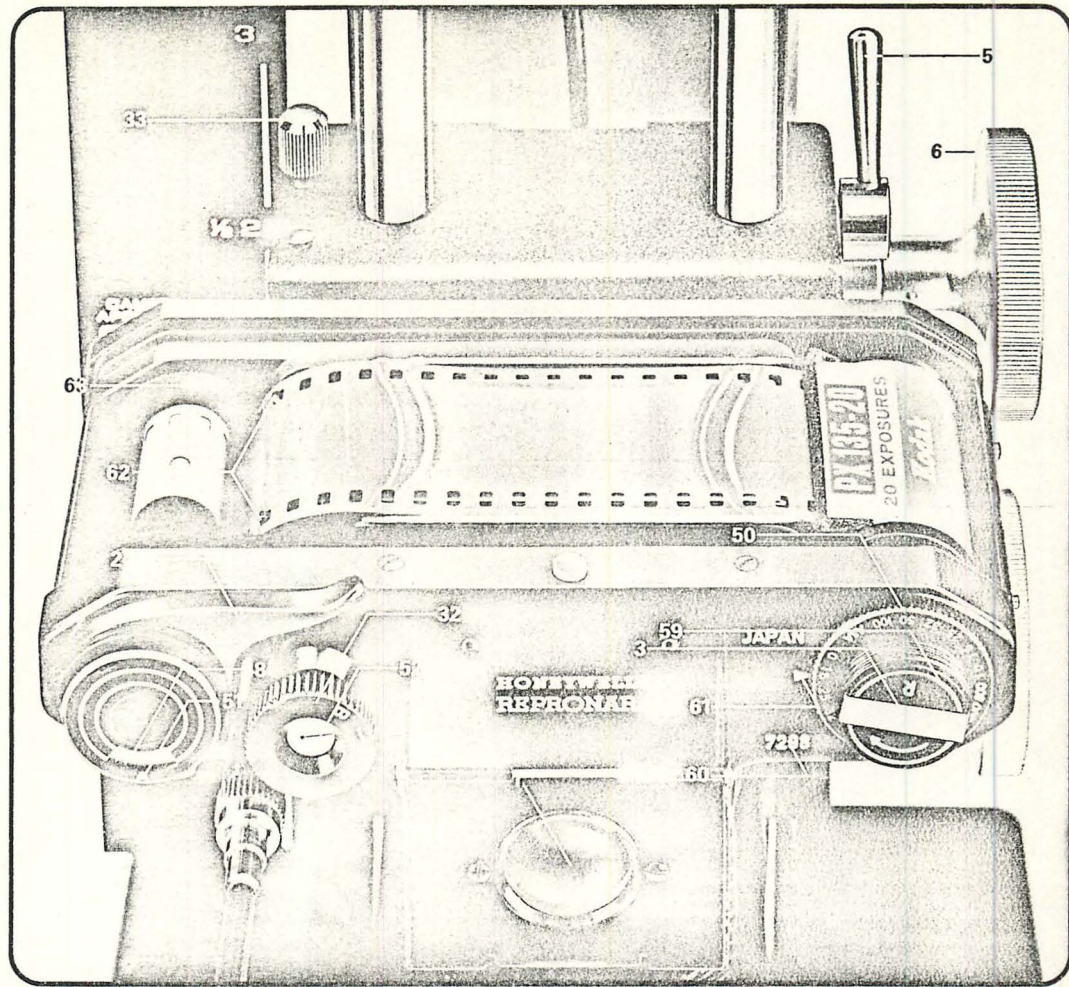
- 11—NAMEPLATE AND CONTROL PANEL—Gives unit identification and directions for proper switch positioning.
- 12—READY LIGHT—Glows when the FLASH-VIEW switch is in the flash position, indicating that the Repronar is ready for copying—the view light is off, and the electronic flash is ready to be fired.
- 13—FLASH-VIEW SWITCH—In flash position, the switch completes the circuit for firing the electronic flash with the camera shutter release; in view position, the switch turns on the view light for illuminating the transparency.
- 14—HIGH-LOW SWITCH—Controls power output of electronic flash. When in the HIGH position, the unit will deliver four times (two f/stops) the amount of light as when in the LOW position. The power output in the LOW position is the same as the previous models of the Repronar.
- 15—ON-OFF SWITCH—Functions as the master switch for the Repronar. The view light and electronic flash operate only when this switch is in the ON position.
- 16—FILTER COMPARTMENT AND HOLDER—Filter holder slides in and out of the filter compartment easily, allowing insertion of filter without disturbing copy or opal view glass.

- 17—LENS CAP—Protects lens when not in use.
- 42—SLIDE HOLDER 2-INCH—Holds all 2-inch slides (35mm, 828, and 127 super slides); may be moved freely on the easel, secured in any position with the magnets, or centered and secured in position with thumb screws.
- 43—SLIDE HOLDER THUMB SCREWS—Lock the slide holder in position on the easel for use in reproducing any number of slides without relocating the slide holder.
- 54—SLIDE HOLDER MAGNETS—Hold the slide holder in any desired position on the easel when thumb screws are not used.
- 55—SLIDE HOLDER 2¼-INCH—Holds 2¼-inch slides for composing and focusing; may be moved freely on the easel, secured in any position with the magnets, or centered and secured with thumb screws.
- 56—FUSE—Used to protect Repronar circuits. Fuse holder located at rear of Repronar.
- 57—CLEAR GLASS—Fits into the Filter Holder (16).
- 58—OPAL VIEW GLASS—Fits flush with work table, or easel. Diffuses the view light to give clear, even illumination for the transparency.

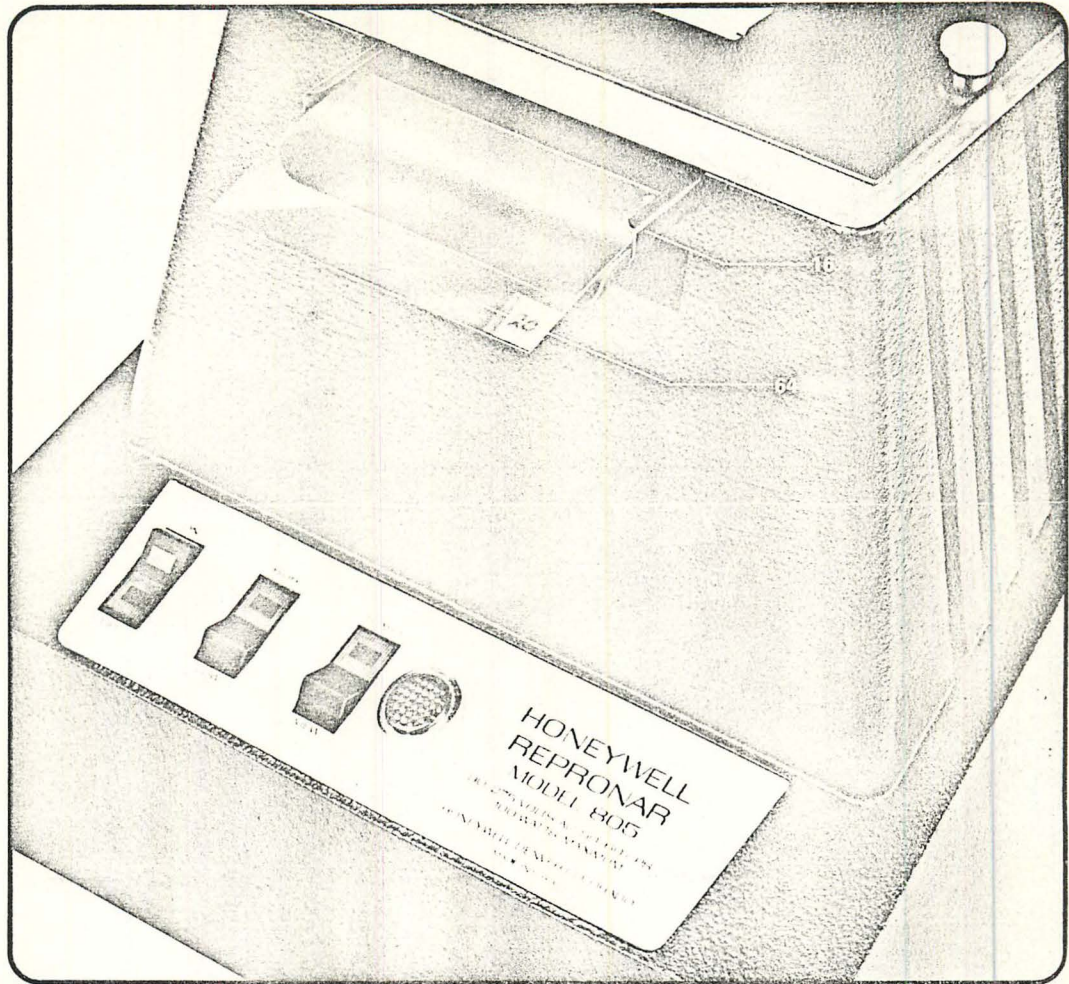


- 3—CRANK FOR REWIND—Crank unfolds for ease of rewinding film into cassette.
- 4—CAMERA CASE LATCH—Secures the removable camera back.
- 5—CAMERA CARRIAGE LOCKING LEVER—Locks the camera carriage in final position after final focusing. Provides one-hand operating ease.
- 7—LENS CARRIAGE TRAVEL KNOB—Large, easy to grasp knob provides quick and positive positioning of lens carriage.

- 37—CAMERA BACK—Removes completely for loading of film. Complete removal allows use of bulk film back.
- 50—FILM REMINDER DIAL—May be used as a reminder as to what kind of film is in the camera body.
- 59—REWIND KNOB—Rewinds the exposed film back into the cassette.
- 60—SERIAL NUMBER—Repronar serial number location.



- 1—MAGNIFIER—Enlarges a portion of the image for sharpest focusing. Swings out of the way for normal viewing.
- 3—CRANK FOR REWIND—Crank unfolds for ease of rewinding film into cassette.
- 5—CAMERA CARRIAGE LOCKING LEVER—Locks the camera carriage in final position after final focusing. Provides one-hand operating ease.
- 6—CAMERA TRAVEL KNOB—Moves the camera on a helical gear and rack mechanism for easy focusing.
- 24—FILM ADVANCE LEVER—Advances film and cocks the shutter in readiness for the next exposure.
- 32—SHUTTER KNOB—Rotates as shutter is cocked (clockwise) and released (counter-clockwise). Acts as selector for "T" and "B" settings.
- 33—MOTOR DRIVE LOCKING SCREW—Locks motor drive in proper position.
- 48—EXPOSURE COUNTER—Shows how many frames have been exposed. Indicates numbers from —2 to 37. Automatically resets to —2 when camera back is released.
- 50—FILM REMINDER DIAL—May be used as a reminder as to what kind of film is in the camera body.
- 51—EXPOSURE COUNTER INDEX MARK—Used as an index for the exposure counter.
- 52—SHUTTER KNOB INDEX MARK—Used to line up the "T" and "B" settings on the shutter knob.
- 59—REWIND KNOB—Rewinds the exposed film back into the cassette.
- 60—SERIAL NUMBER—Repronar serial number location.
- 61—INDEX MARK—FILM REMINDER DIAL—Used to remind user what film is in camera. Has no mechanical function in operation of camera.
- 62—FILM SPROCKET TEETH—Part of film transport mechanism. Fits into film sprocket holes.
- 63—FILM TAKE-UP SPOOL—Holds exposed portion of film.



16—FILTER COMPARTMENT AND HOLDER—
Filter holder slides in and out of the filter
compartment easily, allowing insertion of filter
without disturbing copy or opal view glass.

64—CC FILTER—Color compensating gelatin filters.
Can be purchased in 3" squares from firms such as
Eastman Kodak.

For additional copies write:
HONEYWELL PHOTOGRAPHIC MS 209
4800 E. Dry Creek Road, Denver, Colorado 80217

Request Repronar Model 805 Nomenclature List
Part No. 16764159-A

APPENDIX II - Film Processing

PROCESSING PROCEDURE

Ilford FP4 film

1. Develop: Microdol X, or D-76, 68F, $5\frac{1}{2}$ minutes, agitation at 30 second intervals.
2. Stop bath: Kodak Stop Bath SB-5a, 65-75F, 30 seconds with agitation.
3. Fix: Kodak Fixer, 65-75F, 5 minutes, agitation at 30 second intervals.
4. Clear: Kodak Hypo-Clearing Agent, 65-75F, 5 minutes, agitation at 30 second intervals.
5. Wash: running water, 65-75F, 10 minutes. To minimize drying marks, treat in Kodak Photo-Flo solution after washing.
6. Dry in a dust-free place.

High Contrast Copy Film

1. Develop: D-19, 68F, $5\frac{1}{2}$ minutes, agitation at 30 second intervals.
- 2 through 6: same as for Ilford FP4 film.

Kodalith Ortho Film, Type 3

1. Develop: Kodalith Super Developer, 1 part chemical A and 1 part chemical B., 68F, open pan development is advisable and time runs from $2\frac{3}{4}$ to 10 minutes, continuous agitation.
2. Stop bath: water
3. Fix: Kodak fixer, 65-75F, 2 - 4 minutes, frequent agitation (a good rule - when film clears, continue to fix for 1 minute)
- 4 through 6 - same as Ilford FP4 film.

BIBLIOGRAPHY

Kodak Darkroom Dataguide

Kodak Professional Photoguide

Kodak data sheets for specific films

Kodak data sheets for specific papers