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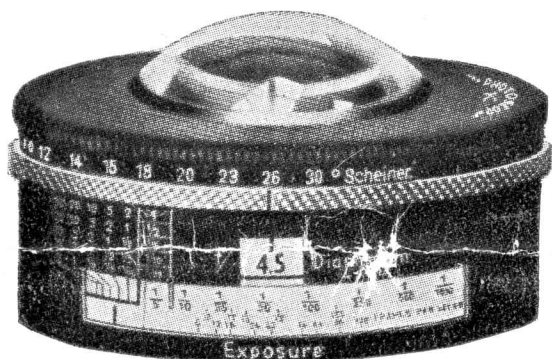
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THE
UNIVERSAL
AUTOMATIC EXPOSURE METER
PHOTOSCOP
U. S. MODEL



**HOW TO USE
THE
UNIVERSAL
AUTOMATIC EXPOSURE METER
PHOTOSCOP
U. S. MODEL**

(See Index Page 16)

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INSTRUCTION

FILM OR PLATE SPEED

In order that the meter read accurately, it must be adjusted for the correct film or plate speed. *This is important!*

Hold the nickelled milled ring, and turn the black front milled ring (carrying the lens and scale of Scheiner degree numbers) to bring the required speed rating opposite the *red* index mark (for Continental, Leica stops) or opposite the *black* index mark (for English stops).

When in doubt about the Scheiner degree speed of the emulsion being used, refer to the film and plate speed table at the end of this instruction.

CHANGING STOP SERIES

The nickelled milled ring, by itself, (and *not jointly* with the black Scheiner ring), can be revolved through the entire circle.

Either the *red* or the *black* index mark on the rim of the nickelled ring can be shifted to the window side and brought to the Scheiner degree. This switches the scales.

The yellow (Continental, Leica) stop scale requires placing of the *red* index mark to the Scheiner degree figure.

The silver (English) stop scale corresponds to the *black* index mark.

Care should be exercised in switching scales. The rings may offer slight resistance which must of course be overcome (especially when new), but extreme force is to be guarded against.

TO FIND EXPOSURE TIME FOR SELECTED DIAPHRAGM STOP

Turn the two rings TOGETHER, gripping the black and the nickelled milled edges at the same time, *so that one does not slip on the other*, to bring the required stop (f value) into view in the centre of the square top window, located between the markings "f" and "diaphragm".

On now pointing the lens of the PHOTOSCOP to the subject, just like a camera, the red pointer will come swiftly to the figure on the time scale in the long window which indicates exposure in seconds for regular "still" or Leica cameras, or—at the lower edge of the scale—the pointer indicates the taking speed for cine cameras in number of frames per second.

TO FIND LENS APERTURE (STOP) FOR SELECTED EXPOSURE TIME

Point the PHOTOSCOP to the subject. Turn both the black AND nickelled rings JOINTLY to bring the selected exposure time figure to the red pointer. The corresponding stop will appear in the diaphragm ("f") window.

EXPOSURE BY ARTIFICIAL LIGHT

The readings of the PHOTOSCOP are direct in daylight as in artificial light, provided the Photoscop is set to the Scheiner degree indicated in the annexed table of Emulsion speeds, for either daylight or Mazda illumination.

As a general rule—under Mazda (Tungsten) light—Panchromatic Emulsions are rated 3 Scheiner degrees less than under daylight; Regular and Orthochromatic Plates and Films are rated 4 degree Scheiner less.

Avoid having lights shine directly into the PHOTOSCOP while taking a reading.

CINE CAMERA EXPOSURES

Taking speed figures from 8 to 128, which represent the number of frames per second, will be found on the lower edge of the exposure time scale.

Bring taking speed figure to the red pointer. The lens diaphragm (stop) value will be seen in the diaphragm ("f") window.

If the indicated stop is larger than the available light power of the lens used, turn your maximum stop into the diaphragm window. The red pointer will indicate the taking speed if available on the camera.

KODACOLOR EXPOSURES

Set the PHOTOSCOP to 23 degrees Scheiner. Turn taking speed (frames per second) to the red pointer. The following table gives settings on adjustable Kodacolor filter for whatever stop may appear in the diaphragm window:

	Stop: 4	5.6	8	11	16
Kodacolor Filter setting:	A	B	C	D	•

LEICA CAMERA EXPOSURES

Specific Leica shutter time is shown a little lower than regular still camera time on the scale.

When using the Leica camera, the yellow scale with Continental series is switched under the window and the Scheiner degree ring adjusted to the *red* index mark on the nickelled ring. Direct Leica readings result.

READINGS FOR LOW ILLUMINATION (Indoor and Outdoor)

On the left of the long time window is a fixed, auxiliary scale. On this auxiliary scale—from right to left—are five black line-marks, which lead over to five columns of the Interpolation table, shown as white figures on black, above the auxiliary scale.

There is also on the auxiliary scale a sixth little mark, farthest on the left, and not connected with the table above the scale. When all the light is shut off or if the illumination is below meter capacity, then the red pointer will rest on this sixth little mark or near it. (See Example Five).

WHENEVER the red pointer does **NOT** move beyond the auxiliary scale marking, the small fixed auxiliary scale, and the values in the white-on-black table above it, must be used.

On the right end and adjacent to the auxiliary scale is a little **CUT-OUT** window, which singles out figures of the long time scale, as they move under it.

Whatever figure appears in or under the little cut-out window, adjacent to the auxiliary scale, is the guide for the row of the interpolation table.

The exposure time for every one of the five marks on the auxiliary scale to which the red pointer may direct, is found in that row of the table, which is headed (on the right) by the same figure as appeared in the little cut-out window.

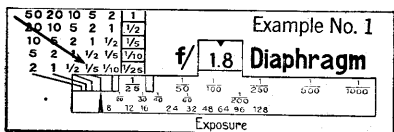
If a figure appears under the cut-out window which is **LARGER** than the unit "1", corresponding to the top row of the table, then the time, indicated for the auxiliary scale marks in the top row, must be

MULTIPLIED by that figure which happens to stand under the cut-out window.

Should NONE of the figures appear exactly in the center of the cut-out, select the one which is nearest to the center, or, rather, the larger of the figures, as if it were standing directly in the center of the cut-out.

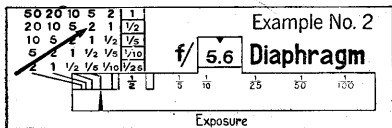
When in doubt, always favor the longer exposure.

EXAMPLE ONE



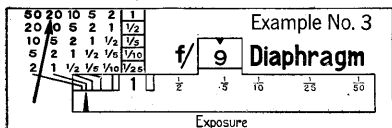
Film Speed 17 deg. Sch. (red mark stands half-way between 16 and 18 deg. Scheiner).—Selected stop f:1.8.—1/25th second appears in the cut-out. You read then in the row of figures beginning with 1/25 in the white-on-black table. If pointer happens to stop on the second line-mark from the right, find in the row headed by 1/25 the second figure from the right, namely 1/5th second.

EXAMPLE TWO



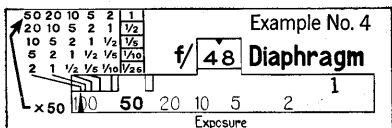
Film Speed 16 deg. Sch. (black mark on 16 deg. Scheiner).—Selected stop: f:5.6.—In cut-out window appears the figure 1/2.—If pointer again stops at the second line from the right, then read in the row headed by 1/2. The second figure in that row from the right, indicates 2 seconds.

EXAMPLE THREE



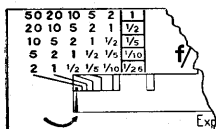
Film Speed 18 deg. Scheiner (red mark).—Selected stop: f:9.—The figure 1 appears in the cut-out window.—If pointer now stops at the second line from the left, find in the top row headed by the figure 1 the second figure from the left, namely 20 seconds.

EXAMPLE FOUR



Film Speed 16 deg. Scheiner (red mark).—Selected stop: f:48.—The figure 50 appears below the cut-out window. The pointer may indicate the first reading mark on the left (not the sixth little mark which indicates "no light" and is on the very left end of the auxiliary scale.) In the top column headed by 1, the last left figure is incidentally also 50. Since "50" shows under the cut-out, any of the figures in the top row should be multiplied. 50x50 equals 2500 seconds—the actual exposure required with the lens diaphragm at f:48.

EXAMPLE FIVE



The red pointer stands on or near the sixth little mark on the extreme left of the auxiliary scale. This mark is not connected with the table above.

In this case the meter indicates that there is not sufficient measurable light and no Photoscop reading can be made.

AIMING THE PHOTOSCOP

Point the PHOTOSCOP towards that part of the subject which should be preferentially and most carefully measured, usually the shadow details. For landscapes, aim at the darker foreground, unless you want to feature sky and clouds, in which case point in their direction, necessarily sacrificing somewhat the foreground.

The "angle of view" of the meter, the cone of light *principally* affecting the measurements, embraces approximately 50 degrees, which is the subtended angle of the average lens. For portraits, small objects or reproductions, approach with the Photoscop as close as possible without obscuring the object. The picture on the negative may cover unavoidably more than the meter field embraces, but the MAIN object will be accurately timed. The meter indicates the best balanced AVERAGE exposure over its range of field.

This makes it also possible to favor either the shadows, or the highlights by reading from a distance near enough to limit the Photoscop field to just that picture section.

The method employed in the Photoscop of collecting light from the subject is by means of a lens of special type. The surface of the lens collects the light and the angle is limited to a certain extent not only by the lens, but chiefly by means of baffles situated between the lens and the cell surface. This combined use of lens AND baffles limits effectively the angle of field when facing a single light source; it is of still greater importance under diffused light, whereunder the Photoscop serves well

with both its important faculties: moderate angle and capacity to read directly, in photographic terms, long time exposures.

CHANGE OF LENS APERTURE VALUES

Close-Up Work and Reproductions

It should be borne in mind that the values of the diaphragm markings on the *lens* are altered as the camera is racked out. The stop numbers on the camera lens apply actually to infinity focus.

For instance, at infinity the aperture may be $f8$. When the camera is extended for reproduction of equal size, the distance from lens to plate will be doubled, whereupon $f8$ as marked on the lens will become "in effect" only $f16$. To admit as much light as would correspond to $f8$, under these circumstances, will require either to open the lens to $f4$, or to leave the lens at the mark $f8$ and to quadruple the exposure time.

The Photoscop supplies automatically the correct exposure time and stop, regardless of distance. The camera lens, however, must be set to **ACTUALLY** represent the f value which the Photoscop demanded. For very close work the lens marking does not represent the true relative f value.

As a general rule these changes are negligible when the distance from lens to object is more than 10 times the equivalent focal length of the lens. For instance, beyond 30 inches for a 3 inch lens, apply the Photoscop reading directly to the lens.

Supplementary Lenses

Using Supplementary Lenses changes the actual value of the f marking on the

camera lens. Telephoto attachments (Distars) increase the equivalent focal length and require longer exposure. Wide-angle attachments (Proxars) decrease the focal length and make exposure shorter.

Apply the diaphragm opening as on the Photoscop, but multiply the time by the exposure factor supplied by the lens manufacturer or previously established.

FILTERS

The retarding or multiplying factors of filters or color screens depend largely on the depth of tint, the kind of illumination and on the color sensitivity of the emulsion. The multiplying factors *indicate how many times* the normal exposure **WITHOUT** any filter must be increased to give correct exposure **WITH** the particular filter.

CARRYING THE PHOTOSCOPE

When photographing, keep the meter suspended from the neck by means of the leather strap supplied. In this way both hands are free to manipulate and hold the camera. Readings can even be made without handling the meter, its position against the body as it hangs usually giving accurate aim.

When walking, the meter may be simply dropped into an outer or inner coat or vest pocket, without removing the strap from the neck.

The Photoscop is completely encased in a smooth dustproof metal housing, without protruding or loose parts or scales requiring protection.

REGISTER NUMBER

Every UNIVERSAL Photoscop, U. S. Model, has an individual Serial number, marked on the bottom of the case, on the side opposite the lens. This identification number should be stated in communications, and its registration with the distributors, Photo Utilities, Inc., 152 West 42nd St., New York, N. Y., will possibly assist recovery in case of loss.

GENERAL REMARKS

While stoutly built, the PHOTOSCOP is a precision instrument, and should be protected against jars and falls the same as the camera.

Be sure that the Scheiner ring is properly set.

Always turn BOTH milled rings, the black AND the nickelled, *jointly*, gripping both milled edges at the same time. The only exceptions are, when shifting either index marks to new Scheiner ratings or when switching from the yellow Leica stop scale to the silver "English" scale.

The lens of the meter—and the lens of the camera—should be kept clean.

Do Not Take the Meter Apart! The fine adjustments would undoubtedly suffer. For such willful actions the responsibility would be the user's.

Ask Your Dealer, or write us. Our information service is at your disposal. State Register number of your Photoscop in all communications.

EMULSION SPEED

TABLE

The speed ratings are in Scheiner degrees

EASTMAN KODAK

Plates:		<i>Day- light</i>	<i>Mazda (Tungsten)</i>
Hyper-Press Plates	23	20	
Eastman 50	20	16	
Eastman 40	17	13	
Eastman D. C. Ortho	14	10	
Eastman Universal	16	12	
Eastman Lantern Slide, regular	4	1	
Eastman Lantern Slide, slow	3	1	
Polychrome	17	13	
Commercial	11	6	
Eastman 33	11	7	
Eastman Process	6	2	
Wratten Hypersensitive Panchro ..	23	21	
Wratten Panchromatic	17	14	
Wratten Process	11	8	
Wratten "M"	11	7	

Films:

Super-sens. Panchro. Cut film	20	17
Portrait Panchro	18	15
Super-Speed Portrait	20	16
Commercial Panchro	18	15
Safety Ortho Press film	20	16
Par Speed Portrait film	19	15
Commercial Ortho	14	10
Commercial	11	7
Panchrom Process	11	8

Eastman (continued)

	<i>Day- light</i>	<i>Mazda (Tungsten)</i>
Process film	4	1
Regular Rollf. & Film-pack	17	13
Verichrome Rollf. & Film-p.	20	16
Supersens. Panchro. Rollfilm Film- pack, & Cinefilm	23	20
Panatomic	19	16

AGFA-ANSCO

Leica Super Panchro Film	23	20
Fine gr. Plenachrome	20	16
Fine gr. Plenachrome	20	16
Panchro Cine, Reversal	17	14
Plenachrome Rollf. & Film-pack ..	20	17
Super Pan Portrait Film	18	15
Supersensit. Panchro Cutfilm	20	17
Portrait Cut Film	20	16
Supersensit. Plenachrome Cut film..	22	18

HAMMER

Blue Label Plate	17	13
Red Label Plate	18	14
Press Plate	20	16
Ortho Special Plate	18	14
Extra Fast Film	17	13
Med. Commercial Film	8	
Med. Commercial Ortho Film	8	4
Supersensitive Ortho Film	23	19
Super Ortho Press Film	23	19

DUPONT

Ortho	17	13
Regular Panchromatic	17	14
Special Panchromatic	23	20

DEFENDER

	<i>Day- light</i>	<i>Mazda (Tungsten)</i>
Regular Portrait Film	20	16
H.G.S. Portrait Film	20	17
Panchromatic	18	15
Xtra Fast Panchro Spec.	20	18
Commercial	11	7

GEVAERT

Express Rollf. & Filmpack	21	17
Sensima Ortho pl. 500	18	14
Super Press Plates	21	17

PERUTZ

Leica Persenso Film	23	19
Fine Grain Film	17	13

COMPARISON

between Scheiner degrees and H. & D.

Scheiner	8	10	11	12	14	17
H. & D.	35	56	72	90	150	310
Scheiner	18	20	21	23	24	
H. & D.	400	800	800	1300	1700	
Scheiner	25	26	27	29	30	
H. & D.	2100	2700	3500	5600	7200	

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