SEKONIC

SUPER MICROLITE METER

INSTRUCTION MANUAL

SUPER MICROLITE METER

SEKONIC

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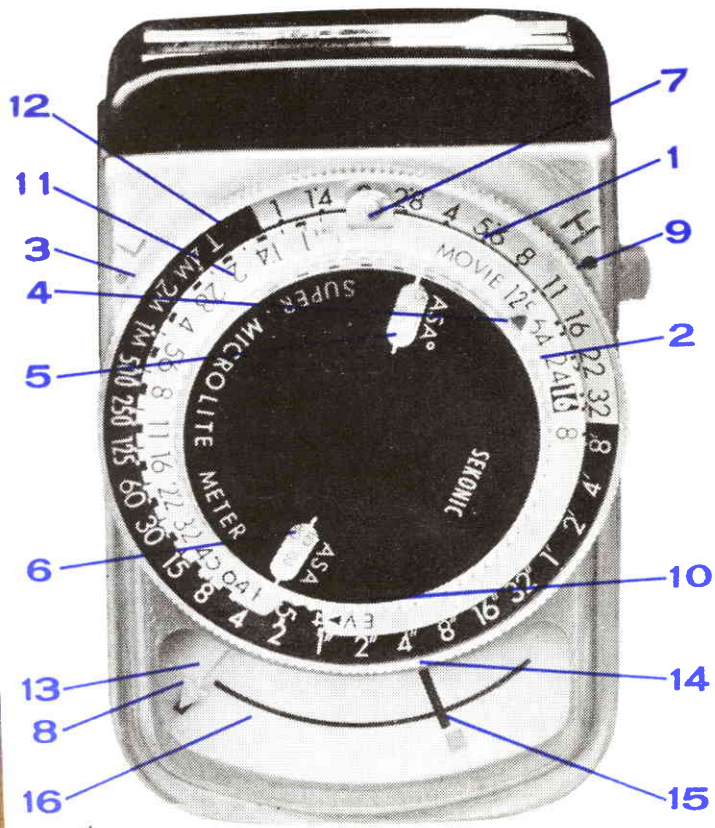
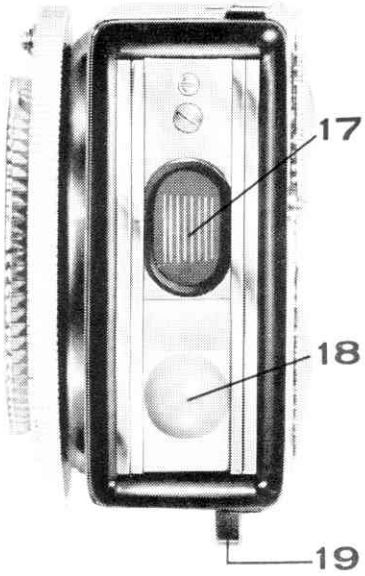
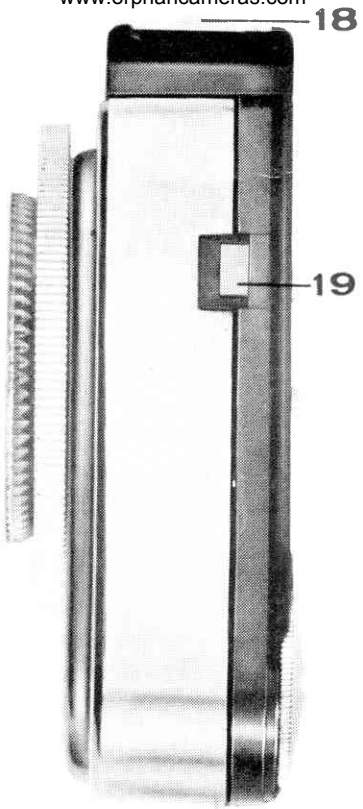
COMPONENTS of the SEKONIC Super Microlite Exposure Meter

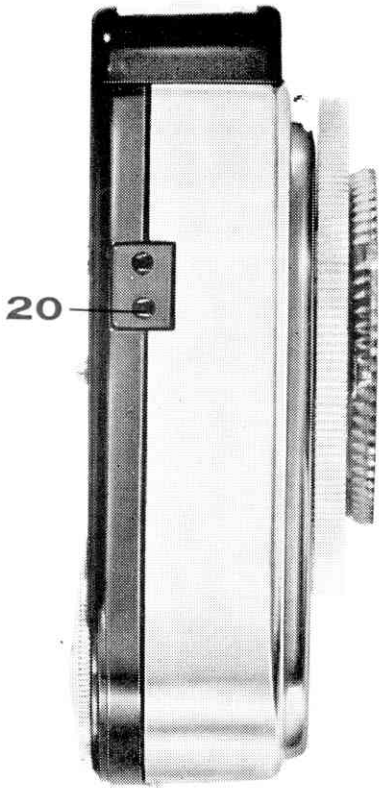


COMPONENTS

1. Lens aperture sacle for movies, from f/1 to f/32.
2. Frames-per-second scale for movies, from 8 to 125 fps.
3. Dot indicates LOW light intensity range.
4. Selector for high or low light level range.
5. ASA degrees window, from 1.0 to 120.
6. ASA film speed window, from ASA 6 to ASA 12,000.
7. Knob for setting ASA film speed ratings and ASA degrees.
8. Blue square indicates correct position for recalibrating cadmium cell indicator needle.
9. Dot indicates HIGH light intensity range.
10. EV (LVS) value scale. No.—7 to No. 19.
11. Lens aperture scale for still pictures, from f/1 to f/64.
12. Shutter speed scale for still pictures, from 1/2000 Sec. to 8 minutes.
13. Cadmium cell needle shows light intensity.
14. Exposure value needle lines up with light intensity needle for exact exposure readings.
15. Battery test mark to indicate sufficient battery strength.
16. Meter window calibrated for foot candle readings.





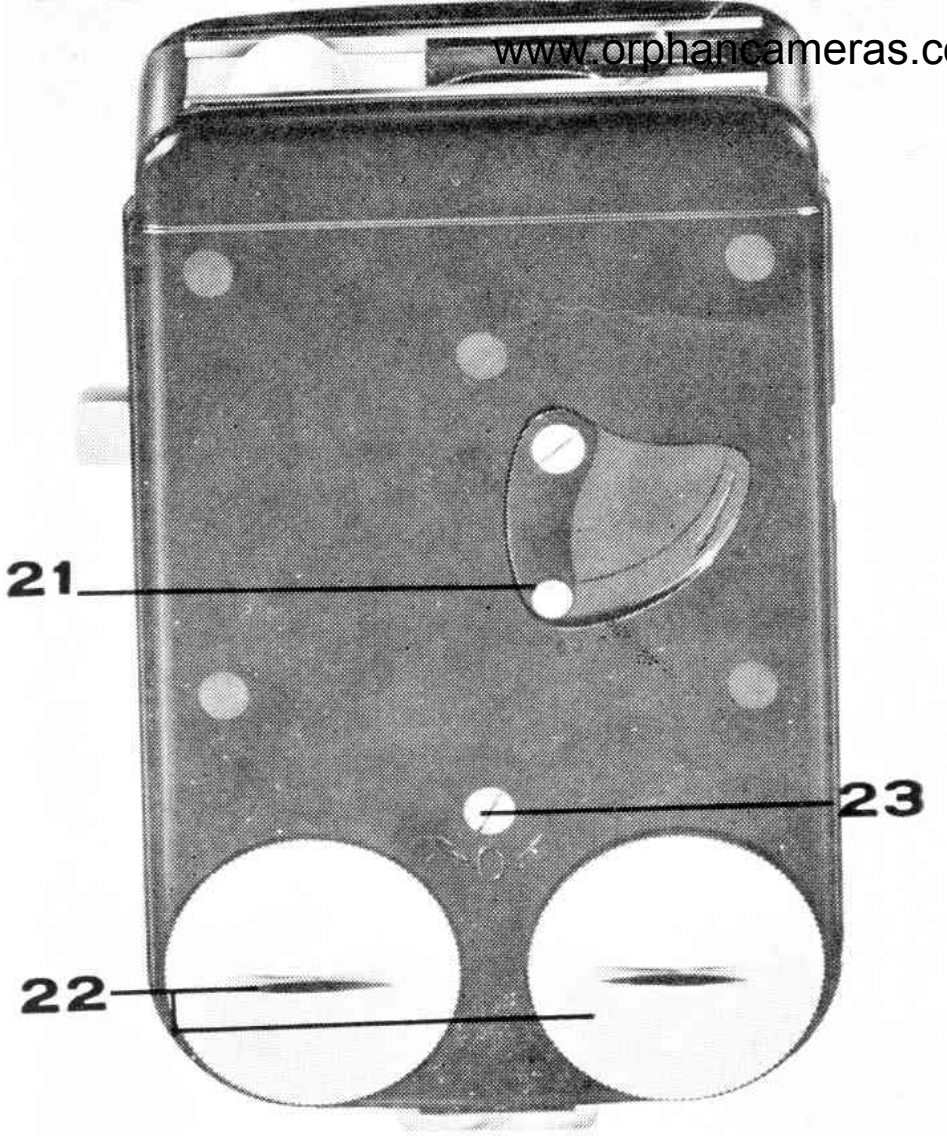


17. Light window accepts a 30 angle.

18. Incident light photosphere slides over light window for incident light exposure measurements.

19. On/off push-button returns to OFF position when released.

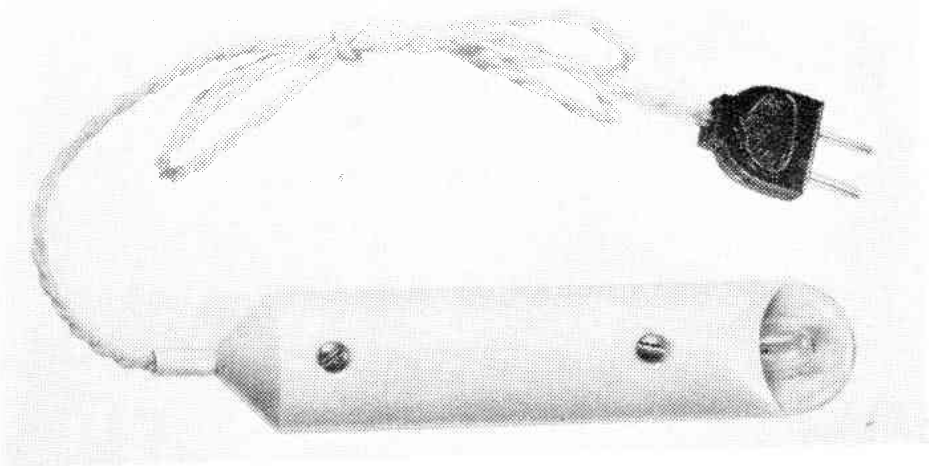
20. Socket for accessory night light.



21. Battery test switch automatically returns to NEUTRAL position when released.

22. Mercury battery housings screw out for rapid replacement of batteries when necessary.

23. Zero reset adjustment screw realigns indicator needle.



ACCESSORY NIGHT-LIGHT

This useful device permits you to read the computer dials accurately, even in total darkness. Simply plug it into the night-light socket (No. 20) and press the night-light ON/OFF switch. Use the light to scan the computer face.

OPERATING PRINCIPLES

THE SEKONIC SUPER MICROLITE EXPOSURE METER

operates on a new and different principle. Its heart is a cadmium sulphide cell which has the remarkable property of acting as an electrical resistor in direct proportion to the amount of light that falls on it.

In a conventional meter, light striking a selenium cell generates the current which causes the needle to deflect. This limits the capabilities of such an instrument since a relatively large amount of light is needed to give a measurable reading. In your Sekonic cadmium cell meter, power is supplied by two mercury batteries. The light being measured serves to activate the cadmium cell as a resistor. Thus, infinitesimally small intensities of light may be measured with exact precision. In fact, the sensitivity of the meter exceeds the sensitivity of any known kind of photographic film! It may now be truly said that anything the eye can see, the camera can record, with precisely measured and calculated exposures.

HOW TO USE THE SEKONIC

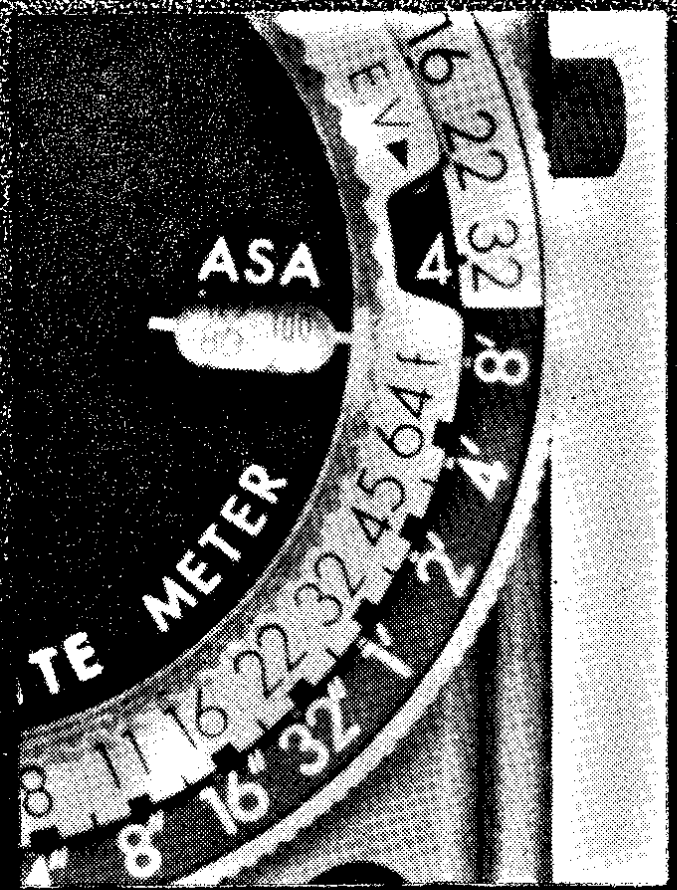
SUPER MICROLITE EXPOSURE METER

SETTING THE SPEED OF YOUR FILM

All photographic films made in the United States, and most made in other countries, are assigned an ASA (American Standard Association) rating. This is a measure of the film's "speed", which is its sensitivity to light.

The ASA rating is usually on the instruction sheet packed with the film. Each ASA rating has an equivalent in degrees. A table of these equivalents appears on page 31.

To set the ASA rating on the meter, rotate the film speed dial by pushing the knob (No. 7) until the correct number appears next to the engraved lines in the ASA window. Notes that this dial is provided with 'click' stops. If no clicks are heard as dial is rotated, and numbers appear upside down, rotate the dial halfway around until clicks are heard.



SELECTION OF **LOW** OR **HIGH** BRIGHTNESS RANGE

Note dot marked with the letter "L" (No. 3) and dot marked with the letter "H" (No. 9) on either side of the meter's housing. To select LOW or HIGH brightness range, move the top dial until the red pointer (No. 4) points to the desired range indicator. The dial rim is knurled to make it easy to grasp.

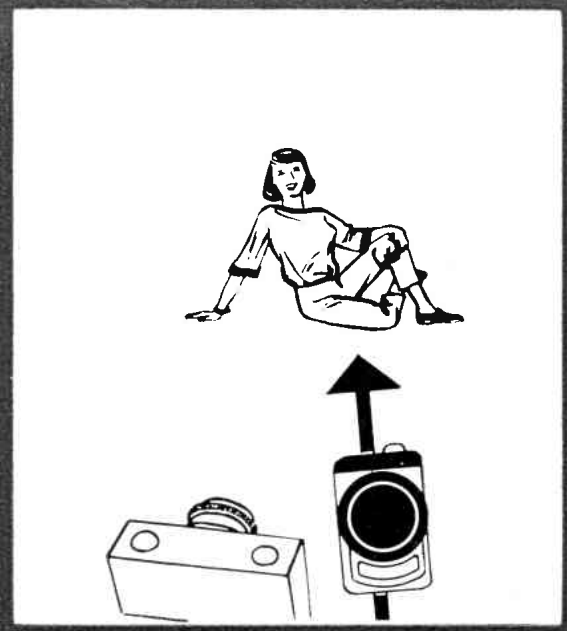
In broad daylight or in near-total darkness, selection of brightness range is immediately apparent. In other conditions, point the meter at any scene and press the ON/OFF switch (No. 19). If pointer is on "H" and the cadmium cell indicator needle (No. 8) fails to deflect, or deflects only slightly, rotate the pointer to "L". If pointer is on "L" and needle swings against the stop at the other end of the window, rotate the pointer to "H"

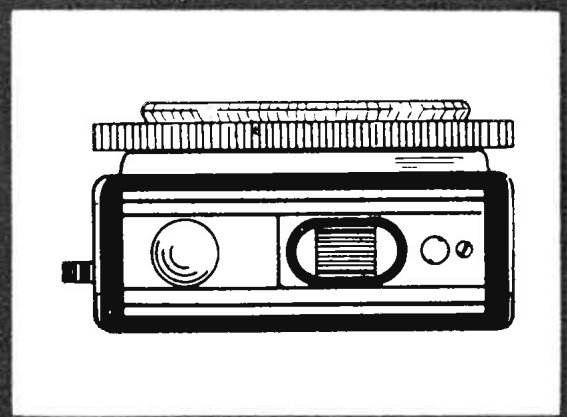
REFLECTED LIGHT

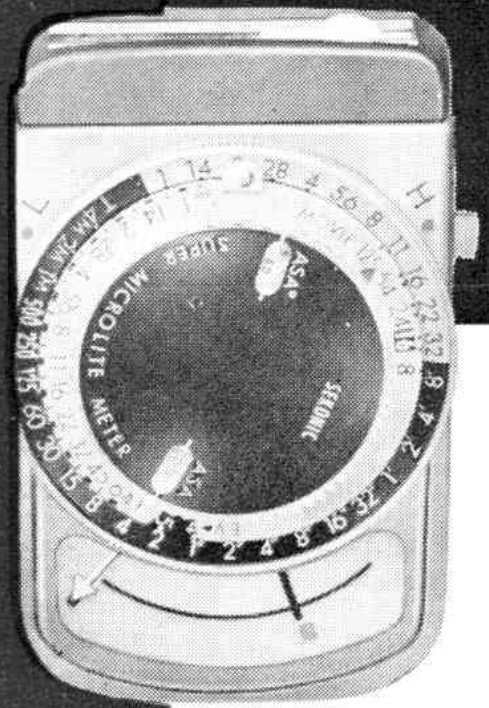
In photographing an object, it is reflected light that the camera and film actually record. The source of light may be the sun, photofloods, the moon, a match, a candle . . . but it is this light, striking the subject and "bouncing" off that must be measured in a reflected light reading.

To take a reflected light reading, move the photosphere (No. 18) fully to the right, uncovering the light window (No. 17). Hold the meter in the same plane as the camera lens (see illustration) pointed toward the subject. Press the ON/OFF switch to permit the light intensity needle to deflect. Hold the switch in ON position and rotate the outside ring of the computer until the black exposure value needle alings exactly with the light intensity needle. Then release the ON/OFF switch.

For greatest accuracy, take readings close to the subject, at about six inches, if possible. Otherwise, hold one hand in similar light and take the reading off the palm of your hand. Be careful not to allow the shadow of the meter to fall on the area of the subject which you are reading.







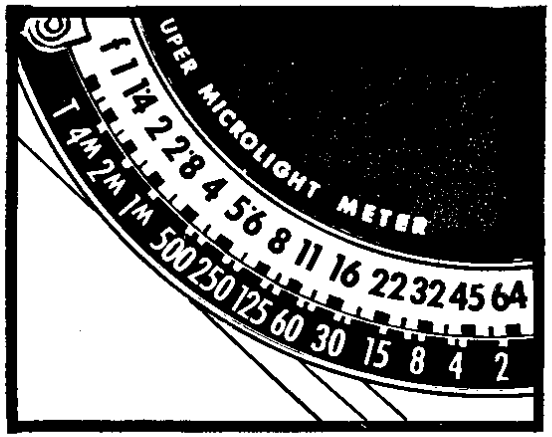
THE COMPUTER

precision and accuracy

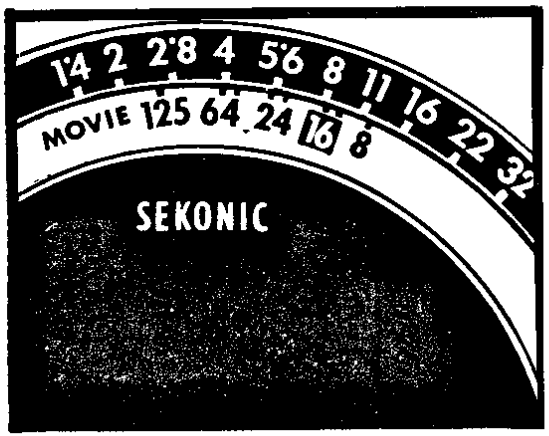
Correct exposure depends on the accurate use of three basic factors: film sensitivity (ASA rating), the amount of light which is permitted to strike the film (lens aperture or f/stop) and the time interval during which light is permitted to strike the film (shutter speed in still photograph or frames-per-second in movies).

The first of these is a characteristic of the film you are using. The second two are determined by the use of the meter's computer.

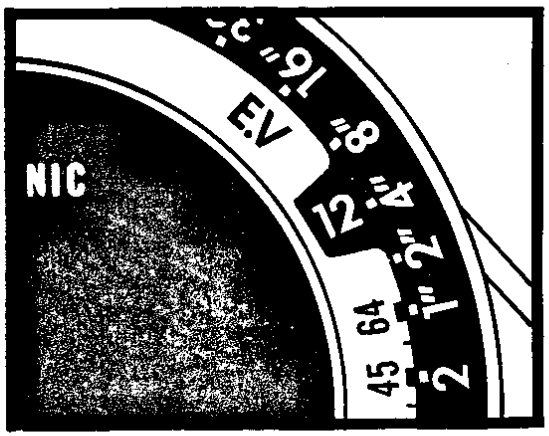
Your Sekonic's Super Microlite computer dials encompass an extraordinarily broad range of f/stop and shutter speed settings (frames-per-second and f/stops for movies). Aligning the exposure value needle (No. 4) with the light intensity needle (No. 13) gives you an extremely comprehensive choice of shutter speed/aperture of FPS/aperture combinations, any one of which will produce the same exposure. How to choose the best combination for the result you wish to achieve, is explained in the following section.



Shutter speed and f/stop scales for "Still" photos.



Frames-per-second and f/stop scales for movies.



EV or LVS Values.

SETTING THE METER READINGS INTO YOUR CAMERA . . .

STILL PICTURES

When a light reading has been taken and the meter needles aligned by rotating the large, outside dial, each value in the shutter speed scale (No. 12) has an f/stop value (No. 11) directly over it.

Examples:

f/1.4	**2**	**2.8**	**4**	**8**	**11**	**and so forth**
500	**250**	**125**	**60**	**15**	**8**	

(On the shutter speed scale "M" means thousandths of a second; 2M is 1/2000 sec.; 500 is 1/500 sec.; 8 is 1/8 sec.; 3″ is three full seconds; 4′ is four full minutes.)

Any of these combinations will produce the same exposure. The choice depends on the picture you want to take. Rapid action, such as sports or baby pictures, or when the camera is hand-held usually require a short shutter speed, faster than 1/100 sec., and a correspondingly wide lens aperture. Extreme close-ups, where depth-of-field is sharply limited, require a small lens aperture and a correspondingly long exposure time. Choose your shutter speed-aperture combination to suit the subject matter.

Also, many lenses exhibit greatest sharpness and definition in the f/4 to f/8 area. If your lens has this characteristic, you may want to

How to select f/stop and shutter speed combinations

limit your aperture to this setting, and choose a correct shutter speed.

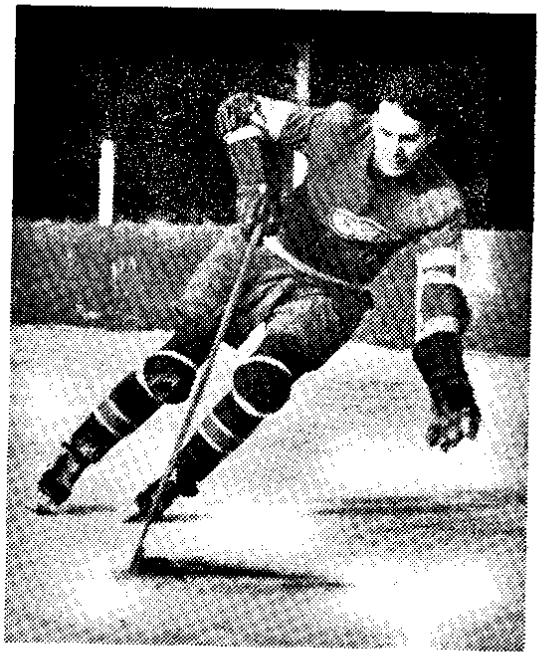
MOVIES

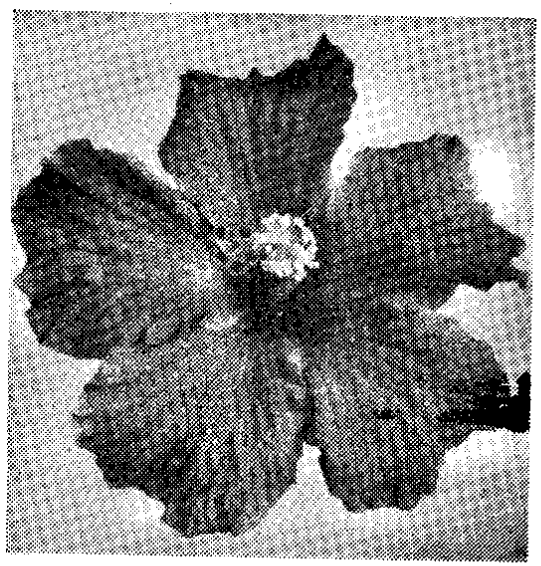
In motion picture work, your shutter speed is predetermined by the frames-per-second at which you are shooting. Most amateurs shoot at 16 FPS. Professional and sound speed is 24 FPS. Or, you may want to shoot at other speeds for special slow-motion and speed-up effects. Your Sekonic computer covers a full range from 8 to 125 frames-per-second and gives you the corresponding lens aperture for each speed.

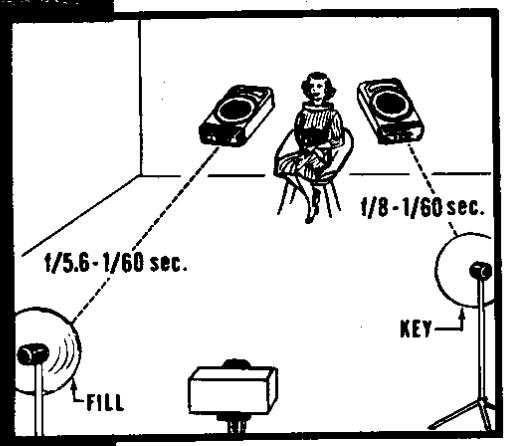
Frames-per-second scale (No. 2) appears on the inner dial following the word "movie". Corresponding lens apertures (No. 1) appear directly beneath each FPS setting on the outer dial. Each frames-per-second numeral is indicated with a gold dot. The gold dot that appears between "24" and "64" represents "32" and "48" FPS.

EV (LVS) VALUES

If your camera is equipped with an EV (LVS) shutter, take readings in the manner described. The proper EV number for the set of shutter speed-aperture combinations will appear in the EV window (No. 10).







BALANCING LIGHT

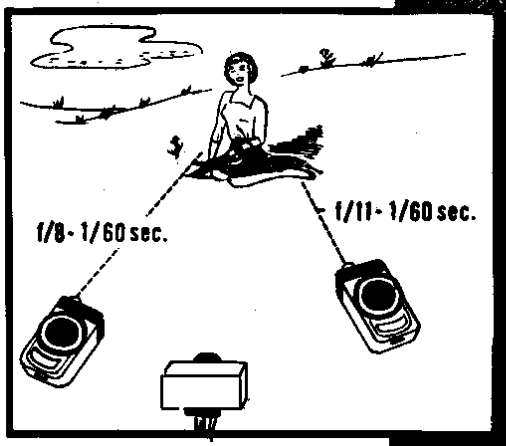
INDOORS (photoflood lights)

The two basic kinds of lighting are "key" or main light and "fill-in" light which gives shadow detail. Your Sekonic meter is a highly accurate means of controlling the ratio between these two lights.

Let us say you want a key to fill-in lighting ratio of 4 to 1. That is, key light is to be four times as bright as fill-in light. Move the photosphere to incident light position, covering the light window. Point the meter at the key light source, from the subject's position, and take an incident light reading for any shutter speed. For example, f/11 at 1/50 sec. Now, point the mater at the fill-in light source. Move this light toward or away from the subject, or add or subtract lights until the meter reads f/5.6 at 1/50 sec.

Since each f/stop down the scale indicates one-half the brightness of light, and f/5.6 is two f/stops from f/11, the fill-in light will now be one quarter as bright as the key. Use the same system to determine lighting ratios between key and any other lights.

OUTDOORS (sunlight)



The sun, of course, is your "key" light. Take a reading with the photosphere in reflected light position (uncovering the light window) on a high-lighted area of your subject from six inches away. Then, take your second, fill-in, light reading off a shaded area of your subject. Use a reflector to throw more into shaded areas if lighting ratio is too wide.

(Alternate Method)

Move photosphere to incident light position, covering the light window. Point the meter at key light source from the subject's position. Note the number indicated on the foot-candle scale (No. 16). Then point the meter at the fill light and rearrange this light until footcandle scale reads 1/4 of the key light value. This is a maximum recommended ratio for color photography. In black and white photography the maximum recommended ratio is 1 to 16.

HOW TO AVOID FILM LATENT IMAGE FAILURE

Your Sekonic meter is equipped to give you extremely accurate readings, even in light situations approaching total darkness. However, when the basic sensitivity of the film is reached, the "latent image", that is, the image recorded on the film before processing, may decay or break up as fast as it is formed by exposure to light. This occurs when exposures longer than 10 seconds are needed.

The result is, increased exposure time will yield no further recording of the image. To avoid this, open the lens aperture of your camera one f/step more than the meter indicates when exposure time is more than 10 seconds. This will permit a more rapid build-up of latent image.

Your Sekonic meter is equipped with an automatic scale light. When brightness range is in "L" position, and ON/OFF switch is fully depressed, the needle window lights with a soft glow. Also, the scale plate is phosphorescent-coated to help you align needles in dimmest light.

FOR BLACK AND WHITE PICTURES

ASA ratings are conservative measurements of a film's true speed. They allow a safety factor of one full f/stop on the side of overexposure. With a precision tool like your Sekonic meter to help you measure light, you can safely *double* the ASA rating of the film, and produce more richly detailed pictures. The resulting number which you set in the ASA window of your meter is called the Exposure Index.

Take exposure readings in the shadow area of your subject, if possible. Black-and-white film has great latitude, and, if the lighting ratio is less than 16 to 1 (4 f/stops), the highlight areas will still retain detail.

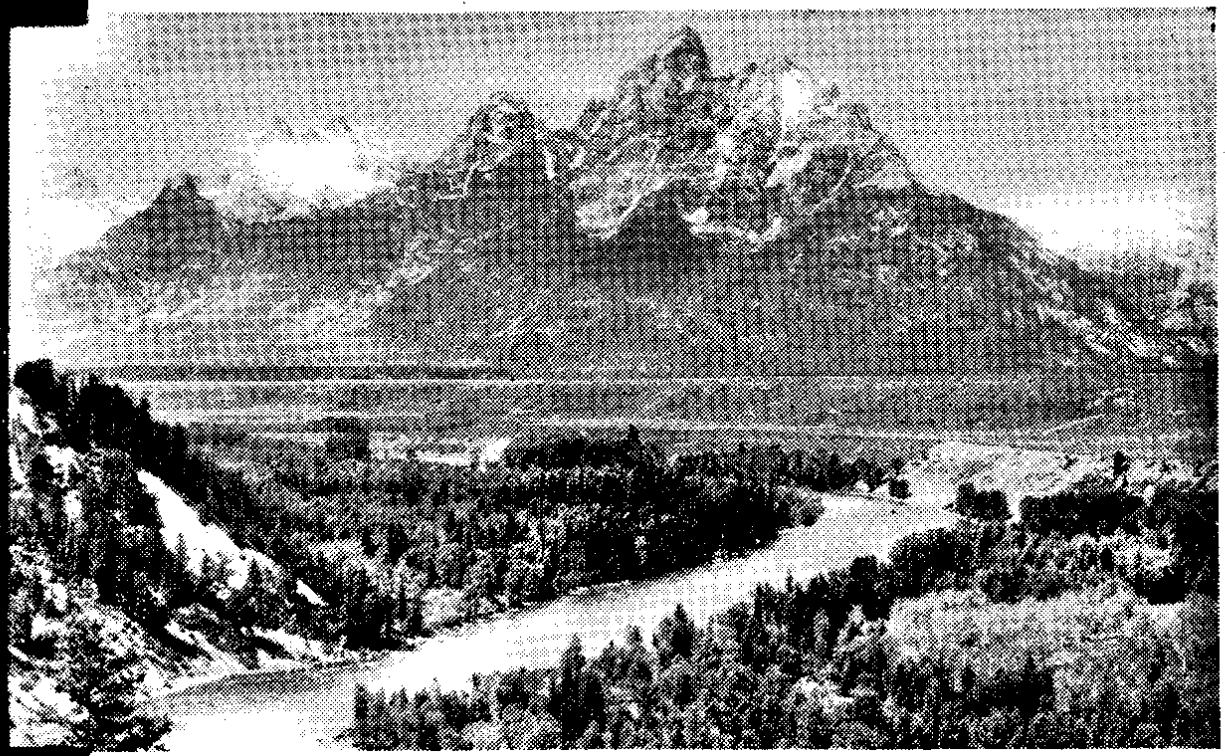
FOR COLOR PICTURES

ASA ratings are accurate for color films, and must be

followed precisely. Color film has far less latitude than black-and-white, and exposures must be made with greater care. Take readings in the highlight area to avoid "washing out" detail through overexposure. If lighting ratio is greater than 4 to 1 (2 f/stops), use a reflector to throw more light into the shaded areas.

Dimmest moonlight, brightest sunlight—brilliant photofloods, candlelight—movies, stills.....in every kind of picture situation under every kind of lighting condition, your Sekonic Super Microlite meter will prove itself an invaluable photographic tool.

On the following seven pages you will find a group of typical picture situations, with instructions for using your Sekonic Super Microlite meter to best advantage in each.

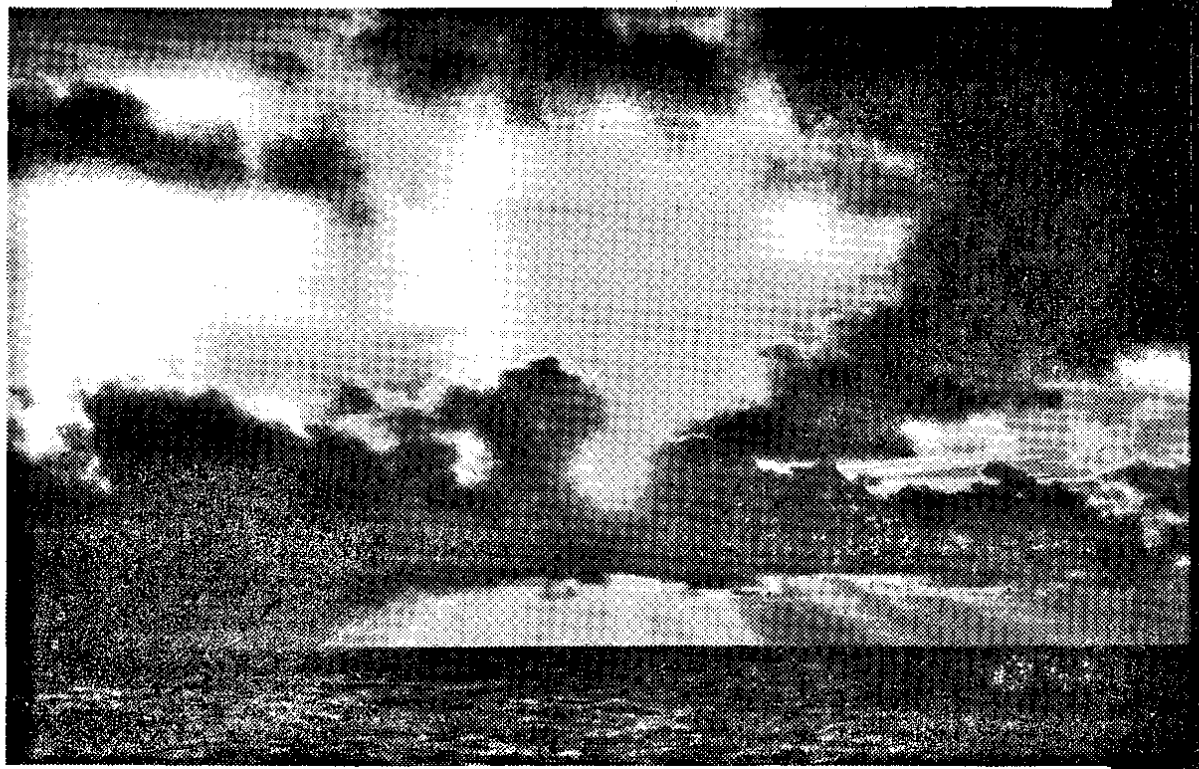


LANDSCAPES AND SCENICS

For reflected light readings, point the meter slightly downwards to avoid glare from the sky, or shade the light window with your hand as you would shade your eyes from the sun. If mist or haze is present, or if farthese areas are extremely bright (snow-capped mountains, for example), set lens aperture 1/2 f/stop smaller than indicated by exposure meter. For example, if the meter reading is f/5.6, set your camera between f/5.6 and f/8.

For incident light readings, do not shade the meter. If mist or haze is present, close lens aperture 1/2 f/stop as indicated above.

SUNSETS



To silhouette objects against a brilliant sunset, use your Sekonic meter in reflected light position, pointing the meter directly at the sun.

To keep detail in foreground objects, use the meter in incident light position, pointing the photosphere directly at the sun.

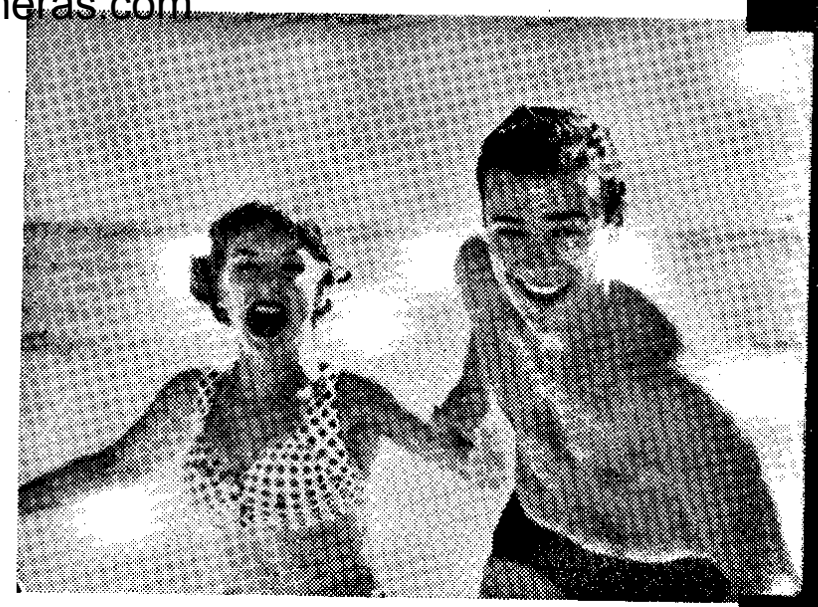
For portraits shot against a sunset, it is advisable to supplement the sunlight with a fill-in flash mounted on the camera. This will avoid dark shadows on your subject's face.

BABIES AND PETS

These subjects will not sit still and "watch the birdie," so use bouncelight to cast an even illumination over the entire room. Direct your lights upward toward the white ceiling at a 45° angle. Place your lights about 2 feet below the ceiling. Use incident or reflected light readings.

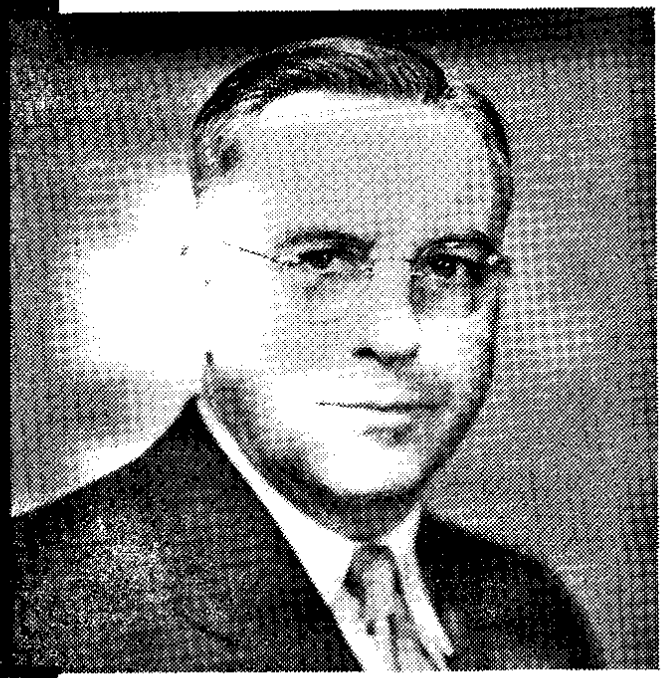
If direct light is used, keep the lighting ratio relatively flat—about 2 to 1. Babies look best in flat, "high key" lighting, anyway.

BACKLIT PICTURES



The sun, or other main source of light behind the subject causes a lovely halo of light around the subject's head. To preserve this striking effect without underexposing facial detail, use your Sekonic meter in incident light position. Take one reading from the subject's position with the meter pointed toward the camera. Take a second reading with the meter pointed at the sun. Set your camera midway between the two readings.

For a fast rule-of-thumb setting, take a reading in the normal way and open one full f/stop beyond the reading indicated.



PORTRAITS INDOORS

For men, character counts. Strong sidelighting and wide lighting ratios.....as wide as 16 to 1, bring out the character lines in a man's face.

For women, glamor is the words. Arrange your key light at about a 45° angle from the camera. Keep fill-in lights close to the camera position. Keep lighting ratio no more than 4 to 1.

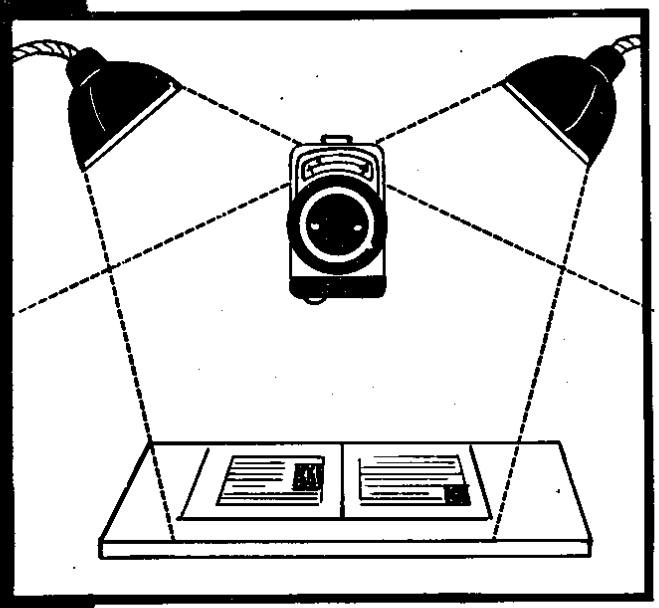
Use your Sekonic meter as described on page 17 to balance lights. Then, turn off fill-in lights and take meter readings with key light only.

PORTRAITS OUTDOORS

The same principles apply. For women, flat, frontal lighting with narrow lighting ratio; strong side-lighting for men with wide lighting ratio.

Photograph women on a hazy day for a soft, diffused effect, or place them in open shade. Men can take much stronger, harsher light.

If lighting contrast is stronger than desired, use a newspaper, a pillow slip or sheet to reflect more light into the shaded areas.



COPYING

Arrange two floodlights at a 45° angle to the work to be copied, so that the light from each falls evenly on the surface to be photographed. Then, cover the surface with a piece of white cardboard of approximately the same size. Hold the ON/OFF switch of your meter down, point the meter downward, directly at the subject, about six inches from it. Move the meter over the entire area to be photographed, watching for needle deflection. Re-arrange your lights until the needle stays steady in one position as the meter scans the subject. Remove the white board. Hold the meter at the camera position and read exposure in the normal manner, using reflected light procedure.

HOW TO COMPENSATE WHEN USING FILTERS

Filters are flat pieces of tinted optical glass which, when placed in front of the lens, absorb certain colors of light and permit others to pass. Since they obstruct some light, exposure compensation must be made when filters are used.

Consult the manufacturer's literature or the retailer to learn the "filter factor" of the filter you are using. Divide this number into the ASA rating of the film, and set the resulting number in the ASA window.

EXAMPLE:

Kodak Verichrome Pan, ASA 80 daylight

doubled for Exposure Index - 160

Yellow-green filter, Filter Factor: 2

160 divided by 2 is 80. Set 80 in ASA window

Indoor (tungsten) color films may be used outdoors with a Type A conversion filter. In this case the manufacturer indicates an indoor and outdoor ASA number:

Kodachrome Type A: ASA 16
With Type A conversion filter, ASA 12

This number should be set in the ASA window without any compensation.

MACROPHOTOGRAPHY-
Photographing Small Objects

In photographing small objects, exposure corrections are needed because of the extension of the bellows of larger cameras, or the use of extension tubes and similar devices with other kinds of cameras. If the object being photographed is closer to the camera than ten times the focal length of the lens being used, exposure compensation will be necessary.

EXAMPLE: **Focal length of lens, 2"**
If object is closer than 20" to the lens, more exposure will be required.
Procedure is as follows :

For cameras equipped with ground-glass focusing

Take a reading in the normal manner, using either incident or reflected light. If reflected light is used, hold the meter at the lens position of the camera. If incident light is used, hold the meter as close to the subject as possible, pointing directly at the camera.

With camera aimed and focused, measure the size of the image on the ground glass. Then, measure the size of the object. Divide the smaller number into the larger to determine the ratio of magnification or reduction. (If image is larger than subject, refer to magnification table. If image is smaller than subject, refer to reduction table.) Find the corresponding correction factor and multiply the exposure by this number.

EXAMPLE: **Object is $1\frac{1}{2}$". Image is $4\frac{1}{2}$"**
$1\frac{1}{2}$" divided into $4\frac{1}{2}$" is 3
ratio of magnification is 3 to 1
exposure correction factor is 16
Open lens 4 f/stops or increase exposure time by 16

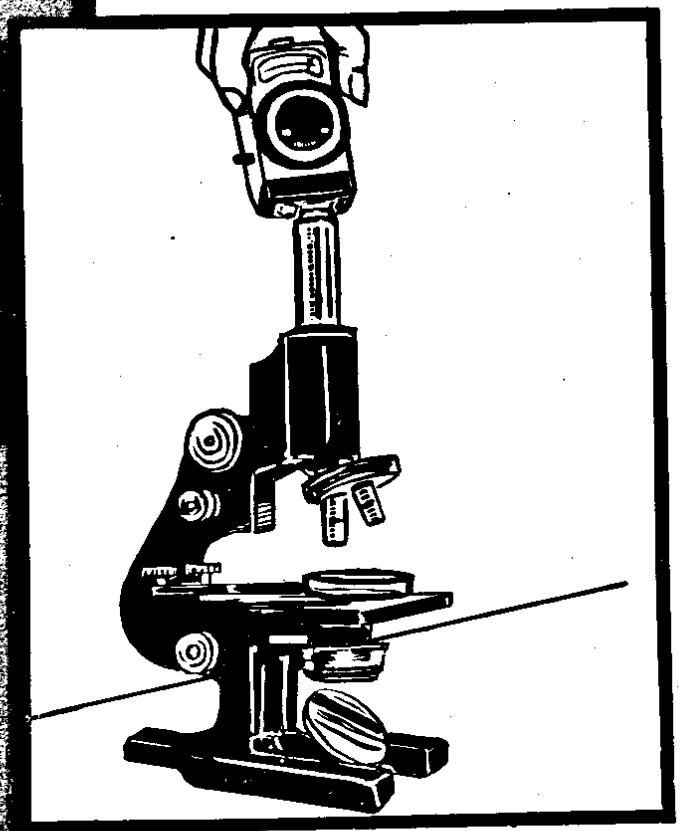
For cameras using extension tubes

Consult the manufacturer's specifications or inquire of the dealer to learn the correction factor for the tube being used. (Most tubes have the correction factor engraved on them.) Multiply the exposure by this factor.

CORRECTION FACTOR FOR CLOSEUPS

(Correction Factor $= (M+1)^2$ where M is the magnification.)

Reduction		Magnification	
Ratio of object to image	Correction Factor	Ratio of object to image	Correction Factor
20 to 1	1.10	1 to 1	4
19 1	1.11	1 1.25	5
18 1	1.12	1 1.50	6
17 1	1.12	1 1.75	7.5
16 1	1.13	1 2	9
15 1	1.14	1 2.25	10.5
14 1	1.15	1 2.5	12
13 1	1.16	1 2.75	14
12 1	1.17	1 3	16
11 1	1.19	1 3.5	20
10 1	1.21	1 4	25
9 1	1.24	1 4.5	30
8 1	1.27	1 5	36
7 1	1.31	1 6	49
6 1	1.36	1 7	64
5 1	1.44	1 8	81
4.5 1	1.50	1 9	100
4 1	1.56	1 10	121
3.5 1	1.65	1 11	144
3 1	1.78	1 12	169
2.75 1	1.86	1 13	196
2.5 1	1.96	1 14	225
2.25 1	2.09	1 15	256
2 1	2.25	1 16	289
1.75 1	2.47	1 17	324
1.5 1	2.78	1 18	361
1.25 1	3.24	1 19	400
1 1	4.00	1 20	441



MICROPHOTOGRAPHY AND TELEPHOTOGRAPHY

To determine exposures in photographing microscopic or telescopic subjects, move the photosphere to reflected light position, uncovering the light window. Focus the instrument. Hold the light window of the meter snugly against the exit optic or the eyepiece of the instrument, allowing no other light to enter the light window. Take an exposure reading in the normal manner.

Where a special camera adapter is provided, remove the camera and hold the light window of the meter in the position the camera lens will occupy. Take a reading in the normal manner.

CONVERSION OF ASA RATINGS TO ASA DEGREES

At times, it may be convenient to refer to film speeds by the American Standards valuation **Sv**. This reference is made in degrees, each successive step representing a change in sensitivity by a factor of the square root of 2. Logarithmic ASA Speed Ratings (**Sx**) and their equivalent degree ratings **Sv** are shown in the following table:

American Standard Sx	American Standard Sv
ASA 12,000	12°
10,000	11.5°
8,000	
6,400	11°
5,000	10.5°
4,000	
3,200	10°
2,500	9.5°
2,000	
1,600	9°
1,250	8.5°
1,000	
800	8°
650	7.5°
500	
400	7°

American Standard Sx	American Standard Sv
ASA 320	6.5°
250	
200	6°
160	5.5°
125	
100	5°
80	4.5°
64	
50	4°
40	3.5°
32	
25	3°
20	2.5°
16	
12	2°
10	1.5°
8	
6	1°

CANDLEPOWER PER SQUARE FOOT (Cd/ft^2) EQUIVALENT TO EACH LV VALUE

EV (**LVS**) numbers may be converted to equivalent candlepower per square foot (**Cd/ft^2**) evaluations for reflected light, or **lux** evaluations for incident light, by using the table on the opposite page.

With photosphere in reflected light position (light window uncovered) take a reflected light reading holding the meter within six inches of the surface of the area being measured. The resulting **EV** number and its equivalent **Cd/ft^2** value will be found in the table.

For **lux** values, move the photosphere to incident light position (light window covered). Hold the meter at the area to be measured, pointed to the light source. Refer to the **EV** number obtained and its equivalent **lux** value in the table.

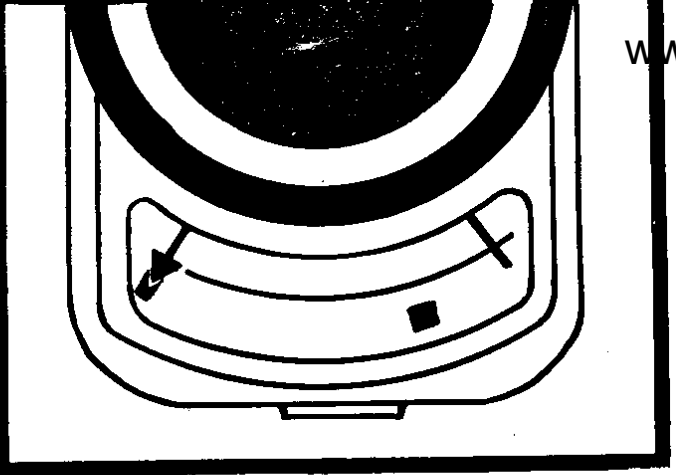
LV CANDLE POWER - LUX CONVERSION TABLE

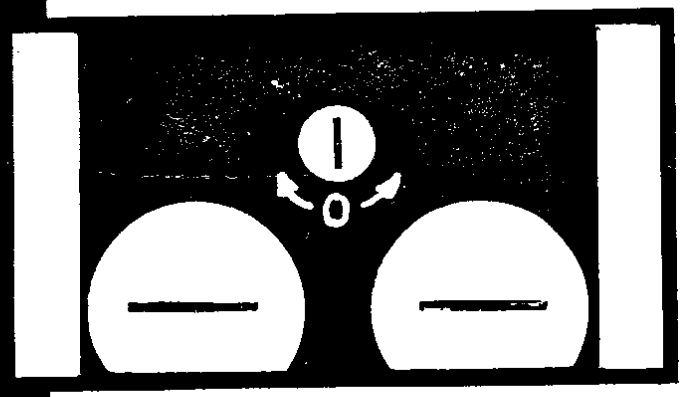
HIGH RANGE
K = 1.3 C = 25 ASA 100

LOW LANGE

LV	cd/m²*	cd/ft²**	LUX	LV	cd/m²*	cd/ft²**	LUX
18	36,000	3345.724	629,600	7	17.5	1.626	307.4
17	18,000	1672.862	314,800	6	8.8	.818	153.7
16	9,020	838.280	157,400	5	4.4	.409	76.9
15	4,510	411.710	78,700	4	2.2	.204	38.5
14	2,250	209.108	39,350	3	1.1	.102	19.3
13	1,130	105.002	19,676	2	0.55	.051	9.6
12	564	52.416	9,838	1	0.28	.026	4.8
11	282	26.208	4,919	0	0.14	.013	2.4
10	141	13.104	2,459.5	-1	0.07	.0065	1.2
9	70.5	6.552	1,229.7	-2	0.04	.0037	0.6
8	35.3	3.281	614.8	-3	0.02	.0018	0.3

*Candle power per square meter. **Candle power per square foot.





HOW TO CARE FOR YOU SEKONIC SUPER MICROLITE EXPOSURE METER

General Instructions

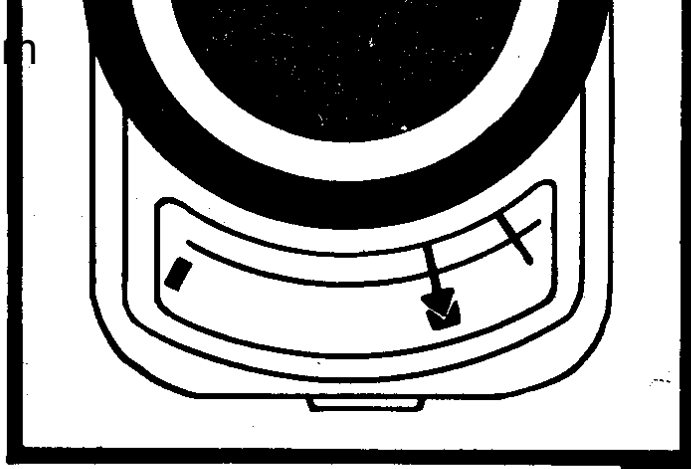
Your Sekonic meter deserves the care accorded any fine, precision instrument. When it is not in use, keep it in its eveready case. Avoid dropping or jarring it by keeping it suspended from its neck strap at all times while you are using it.

Clean the photosphere and the light window occasionally with a lens tissue. Stubborn dirt or finger marks may be removed with a drop of lens cleaning fluid. Clean the indicator needle window in the same manner.

Checking for correct "zero" calibration

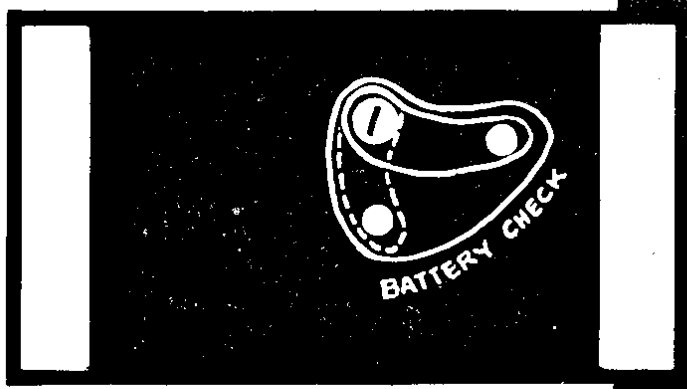
With the ON/OFF switch in OFF position, the red light intensity needle should rest directly over the black rectangle (No. 8) at the extreme left side of the indicator window. If the needle does not rest in this position, rotate the zero reset adjustment (No. 23) on

the back of the meter with a fine screwdriver until the needle is correctly positioned. Usually only a very small adjustment will be needed.



Battery Check

To check battery strength, move battery tester switch lever (No. 21) as far as it will go. Orange light intensity needle should deflect to blue rectangle (No. 15). If needle fails to deflect fully to this position, batteries must be replaced, since mercury batteries do not lose power gradually but fall off very sharply when exhausted.



Replacing batteries

Use a coin or screwdriver to remove battery housings (No. 22). Batteries will drop out into your hand. Replace with batteries of identical specifications:

Volts: 1.3
mA : 20
mAH : 420
Dimensions: 16.1mm diam. × 11.5mm high

Mallory RM-640R and Eveready E640 batteries meet these specifications.