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I have no connection with any camera company

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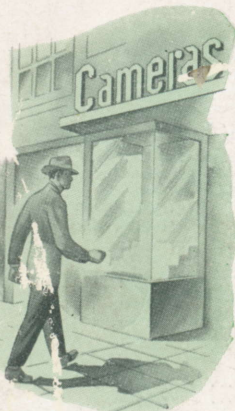
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Mailing Instructions for Repairs



If your exposure meter becomes damaged and fails to operate, return it to your photographic dealer.

If not convenient to return to the dealer, it should be mailed directly to the General Electric Company—40 Federal St., West Lynn 3, Mass., or (West of Rocky Mountains) to 561 Bryant St., San Francisco 6, Calif. If a resident of Canada, send to Canada General Electric Company Ltd., 212 King St., West, Toronto, Canada.

When returning an exposure meter for repair, attach an identification tag, bearing the sender's name, address, and the instrument's serial number.

To avoid further damage during shipment, carefully pack the meter in a stiff, sturdy box; make sure that sufficient padding is around the instrument to absorb the shock of handling.

Photo Data Service

General Electric has made available for your use its Photo Data Service Bureau and Sensitometric Laboratory.

The purpose of this Bureau and Laboratory is to offer assistance in solving your problems dealing with exposure, lighting, and the use of the G-E meter in the darkroom. Address all correspondence relevant to these subjects to:

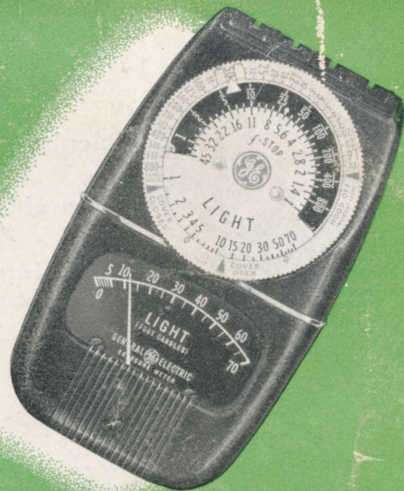
GENERAL ELECTRIC COMPANY

Photo Data Service Bureau
Meter and Instrument Divisions
40 Federal St., West Lynn 3, Mass.

APPARATUS DEPARTMENT

GENERAL  ELECTRIC

SCHENECTADY, N. Y.



How to use your

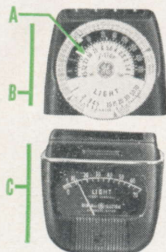
• Type DW-68

Exposure Meter

GENERAL  ELECTRIC

Getting Acquainted

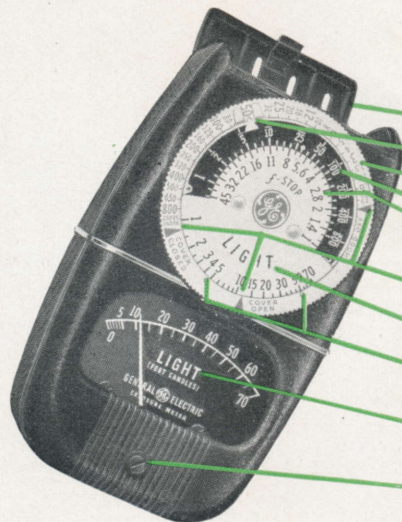
with your Meter



A Calculator

B Removable hood

C Indicating instrument



The correct measurement of light is of such vital importance in taking pictures that the photoelectric exposure meter has become an indispensable part of the photographer's equipment. Your G-E meter will help you get better-quality pictures at less cost by selecting the proper exposure for every type of film.

It can be used for reflected light, for incident light, in the darkroom, and for general light-measuring purposes. It has been designed for either movie or still photography and *black-and-white* or *color* films. It is a precision instrument that will provide many years of faithful service.

Hinged cover (shown open)

Tab for setting exposure-index number

Outer dial (exposure-index numbers)

Middle dial (time)

Inner dial (*f*-stops)

Arrows (COVER CLOSED, COVER OPEN, or HOOD OFF) for setting light values

Calculator light values

Diamond and spade symbols for incident-light measurements

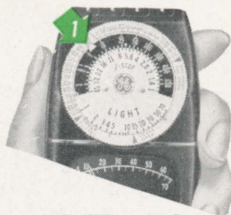
Indicator light values

Screw for adjusting pointer to zero (when no light is on cell)

Using your

1 Set Film-exposure Index

Move tab on middle dial until its arrow is opposite proper exposure index (film speed) on outer dial.



2 Using Meter with Hood On



b If no reading is obtained (or reading is very low), open hinged cover at front of hood and read value of light indicated.

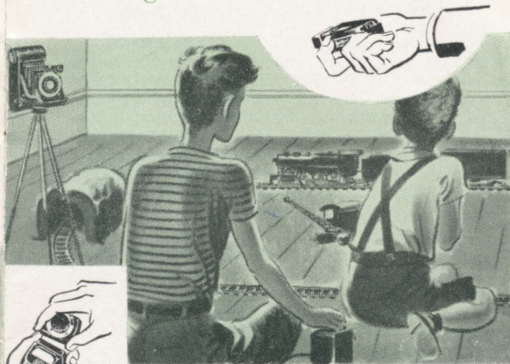


a Point meter at scene and read value of light indicated.



Exposure Meter

3 Using Meter with Hood Off

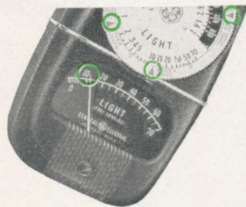


When no reading is obtained with hood on, remove the hood (by bending toward you) and point the meter at the camera, from the subject, and read light value indicated.



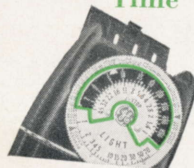
4 Set Calculator

Set proper arrow on outer dial opposite value of light on calculator.



5 Read *f*-stop and Time

Any combination of *f*-stop and time appearing opposite each other will give proper exposure.



Useful Methods for Measuring Exposure

Outdoor Scenes

The meter is read when pointed toward the subject from the camera position, in the same manner as you point your camera. This technique is satisfactory for practically all outdoor scenes. The main exception is where the brightness in the background, as viewed by the meter, is widely different from that of the principal subject. Examples of such scenes are back-lighted subjects and dark subjects against light backgrounds. For these scenes, the exposure should be measured by taking a close-up reading on the actual subject or a similar substitute subject.

In making a close-up reading, the meter is actually held as near to the subject as convenient. (Be careful not to measure the shadow cast by the meter.) Although the brightness of a subject is independent of distance, the meter can indicate that brightness so long as it sees only the particular subject; hence, it is held close to small subjects, but may be held proportionately farther from larger surfaces.

As a substitute of corresponding reflectance, the palm of the hand is often convenient. A close-up reading, with the meter held about four inches from the hand, will give dependable exposure for average scenes. If the subject is in a shadow, the hand is held in the shadow of the body.

Sometimes it is necessary to determine exposure on the basis of reading from the camera position. The exposure is then simply doubled for side-lighted subjects and redoubled for back-lighted subjects.

Indoor Scenes

With daylight illumination, use daylight exposure index; with photoflood illumination, use tungsten exposure index. A close-up reading of the most important part of the subject will give dependable exposure.

Incident Light

Measuring the light that actually falls on a subject is especially valuable for determining the exposure under dim-light conditions. To do this, the hood is snapped off, and the meter is held near the subject with the cell pointed toward the camera. The exposure is then dialed, using the HOOD OFF arrow on the calculator. The meter then gives the best average exposure for the measured illumination.

If, outdoors, the meter cannot conveniently be held near the subject, the incident light can be measured from any position where the illumination is the same. For example, at dusk when the light may be dim but uniform, the incident light can be measured from the camera position.

This method (incident-light method) of measuring exposure is highly dependable. It gives correct exposure for the middle tones in a picture regardless of the brightness of the scene or the predominant brightness of unimportant parts of the subject. If the important parts of the subject should be unusually dark, the exposure can be increased $\frac{1}{2}$ f-stop; if unusually light, the exposure can be decreased $\frac{1}{2}$ f-stop.

The Type DW-68 meter can be used to measure incident light, under all light conditions, by extending its range with multiplying masks. A set of four such masks is available with multipliers of 10, 40, 100, and 400. The masks may be obtained at photographic dealers.

After the illumination has been measured, the value of the light reading is set opposite the proper arrow on the calculator.

MASK

None
10X
40X
100X
400X

ARROW

Hood Off
Spade
Cover Open
Diamond
Cover Closed

Exposure for Color

Color photography requires the exact measurement of exposure in order to obtain faithful reproductions. Close-up reading on the principal parts of the subject usually gives the most accurate exposure.

The lightness or darkness of a color transparency is controlled by the exposure, but within the film's latitude the color reproduction is largely determined by the color of the light. *Direct* sunlight between 9 a.m. and 4 p.m. is the best source of light to get accurate results with daylight color film. Illumination from a blue or gray sky or that in the shadow areas usually imparts a bluish tinge to the picture. Direct sunlight is reddish in the early morning and late afternoon.

Most color film of the indoor-roll type is color-balanced for photo-flood illumination, but some sheet film is made for use with 3200 K lamps.

Fill-in Lighting

People often squint their eyes unbecomingly when facing the sun, and usually prefer to pose looking away from it. While the blue sky is likely to lend a bluish tinge to the picture, the color can be corrected by reflecting white light onto the face from white cloth, newspaper, white cardboard, a white adjacent wall, or with a metal-foil reflector. The reflector should preferably be held somewhat above the head of the subject so as to reflect light downward onto the face in a natural direction. The exposure is measured by a close-up reading on the face with the reflector in its operating position.

Blue photo-flood lamps may be used to supplement daylight illumination for taking indoor pictures. Flash lamps may sometimes be convenient for lighting shadows in outdoor pictures. There are several publications on this subject that your dealer can recommend.

Exposure for Movies

Since the movie camera really takes a series of rapid still pictures, the measurement of exposure for movies is the same as for still cameras.

There is one difference, however, in that the shutter speed is fixed and the exposure is controlled by adjusting the *f*-stop on the lens. The dot next to the 1/25 second on the shutter-speed dial (see page 2) indicates 1/30 of a second, which is the most common amateur, silent-motion-picture shutter speed (16 frames per second). Therefore, when the exposure has been measured and the dial adjusted, the proper *f*-stop setting will be found opposite the dot. Some movie cameras, however, do not have a shutter time of 1/30 second at normal speed. To determine the normal shutter speed of your camera, refer to its instruction book.

Some movie cameras are designed to run at several speeds. Slow camera speeds, of course, make the action faster or can be used in poor light. High camera speeds are used for slow motion. The fact to be remembered is that a change in camera speed changes the effective shutter speed. Examples are: 16 fps = 1/30 second; 8 fps = 1/15 second; and 32 fps = 1/60.

Movies can generally be made only in bright and medium light. It is not practical to take movies in dim light where the G-E meter must be used with the hood off. Indoors, where possible, a close-up reading should be made.

Telephoto and wide-angle lenses are frequently used with movie cameras. From the standpoint of exposure no special problems are presented, and the exposure should be measured in the normal manner.

The G-E meter can be used to give accurately exposed movie titles. With color films or reversible black-and-white film, the meter reading should be made on a neutral gray card such as a gray blotter or ordinary cardboard if the title background is black or white. With positive films, the exposure index given is based on a meter reading from a white card.

Technical Data

VALUES OF MARKINGS ON ASA CALCULATORS

<i>f</i> -stop Markings					
1	2	4	8	16	32
1.1	2.3	4.5	9	18	36
1.3	2.5	5	10	20	40
1.4	2.8	5.6	11	22	45
1.6	3.2	6.3	12.5	25	
1.8	3.5	7	14	28	

Time Markings					
120	12	1.2	1/8	1/80	
100	10	1	1/10	1/100	
75	8	0.8	1/12.5	1/125	
60	6	0.6	1/15	1/150	
50	5	1/2	1/20	1/200	
40	4	1/2.5	1/25	1/250	
30	3	1/3	1/30	1/300	
25	2.5	1/4	1/40	1/400	
20	2	1/5	1/50	1/500	
15	1.5	1/6	1/60	1/650	
				1/800	

Acceptance

Angle of incidence for 50 per-cent cutoff:

Cover open	Horizontal... ≈ 24 deg
	Vertical..... ≈ 15 deg
Cover closed	Horizontal... ≈ 18 deg
	Vertical..... $\approx 12\frac{1}{2}$ deg

Light Measurement

The Type DW-68 becomes a light meter when the hood is removed. Its angle of acceptance is then approximately 180 degrees, and it measures light intensities directly in foot-candles.

The light meter has many uses in the factory, store, office, and home in determining the proper illumination required for different activities. The following table gives recommendations that, experience has shown, provide adequate protection for the eyes.

ACTIVITIES	RECOMMENDED FOOT-CANDLES
Factory	
Rough Work.....	10
Fine Work.....	50-100
Stores.....	15-20
Offices.....	30-50
Drafting Rooms.....	30-50
Schools.....	20-50
Home	
Sewing.....	50-60
Reading.....	25-35

Light intensities that are lower than those recommended are likely to cause eyestrain. High intensities are desirable if the source of light is not concentrated. Where indirect or fluorescent lighting is employed, higher intensities have become common. Many new installations provide more than 50 foot-candles for office work. When being used to measure light, the meter should be held at the place on which the worker's eyes are normally focused, and the cell should be held parallel to the work. For example, in measuring the light required for drafting, the meter is placed on the drawing board in the center and edge of the working area.

Conversion Factors

Approximate conversion factors for G-E meter are:

- With hood on, cover open:
8 x light-value reading = Foot Lamberts
- With hood on, cover closed:
80 x light-value reading = Foot Lamberts
- With hood removed:
Light-value reading = ft-candles