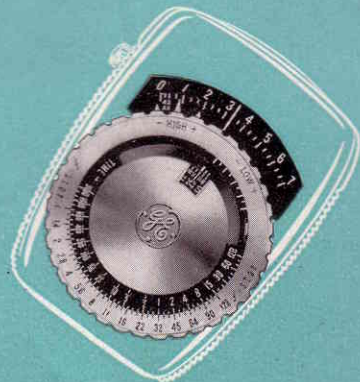


APPARATUS DEPARTMENT

GENERAL  ELECTRIC

SCHENECTADY, N. Y.



How to use your



TYPE PR-1

Exposure meter

THE METER WITH A MEMORY

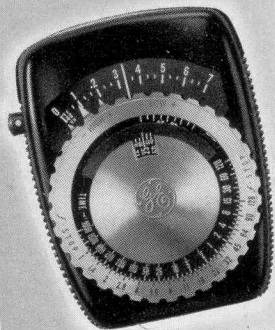
8-47 6336

Price U.S.A.—25¢

MADE IN U.S.A.

Introducing

the Type PR-1 Exposure Meter



Here is an exposure meter so *easy to operate* that the beginner can use it with the minimum of effort—yet it is *so complete* in every respect that it meets the demands of the most advanced photographer.

Improved techniques and new materials developed during the war enable us to bring you a meter that is the *smallest in size* and *lightest in weight* of any top-quality meter. Only the G-E meter gives you such exclusive features as the *trident analyzer*, the *synchro-calculator*, and the *pointer lock*.

Your meter can be used for *reflected light*, for *incident-light*,* in the darkroom, and for general *light-measuring purposes*. It has been designed for either movies or still photography and *black-and-white* or *color* films. Because of its *sturdy* construction it will, with reasonable care, provide many years of faithful service.

*The incident-light attachment is available at photographic dealers.

Copyright, 1947 by General Electric Company

Book + Mater 9/11/82 Z
B. Muhl

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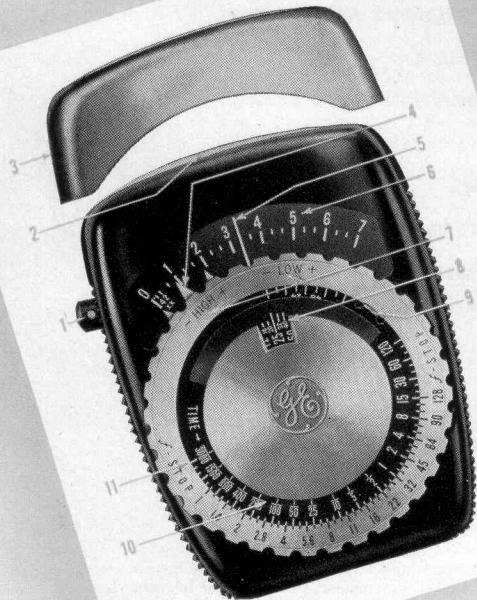
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The first few pages of this book identify parts of the meter and tell you where to look for all the essential information you will need to start using it. Naturally, the more you know about your meter—and about light measurement—the better your photographic results will be. A leisurely study of all of the information in this book is recommended.

Getting

Acquainted

with your meter



- 1 Pointer-lock button
- 2 Light-gathering lens (for photovoltaic cell)
- 3 Incident-light attachment
- 4 Trident analyzer
- 5 Pointer
- 6 Light-value scale
- 7 Light range
- 8 Film-exposure-index number
- 9 Tab for setting film-exposure-index number
- 10 Shutter-speed (inner) dial
- 11 f-stop (outer) dial

For more information about various parts of your meter, read the section on Design Features on pages 35 to 42.

Using your Meter

PRESETTING

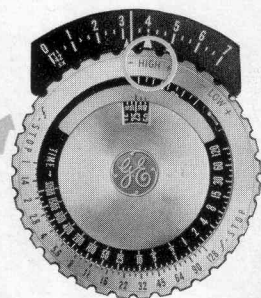
Set Film-exposure Index

Still-camera
Film

Set the proper exposure index opposite the main index mark. The tab and the *shutter-time scale* should be in the approximate position shown in "A" below.

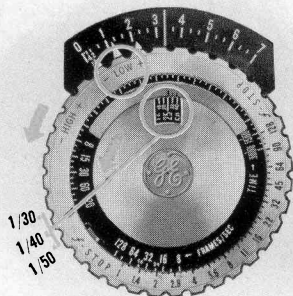
Motion-
picture Film

The tab and the *frames/second scale* should be in the approximate position shown in "B" below. Respective index marks for cameras with exposures of 1/30th, 1/40th, and 1/50th of a second at 16 frames/second are indicated in the illustration.



A

B. For *medium or dim light* turn *f-stop dial counter-clockwise* until trident appears above **LOW**.



B

Set Apparent Light Range

A. For *bright light* turn *f-stop dial clockwise* until trident appears above **HIGH**.

With your presetting accomplished you are now ready to proceed with the **PRESS • SET • READ** operation of your meter.

PRESS • SET • READ

1 **PRESS** the pointer-lock button to free the pointer. Proceed with your light measurement as explained on pages 13 to 21. If pointer is above "6" on **LOW** range shift to **HIGH**. If pointer is below "1" on **HIGH** range shift to **LOW**. When you have obtained the proper reading release the pointer-lock button. The meter holds your reading—remembering what it has read.



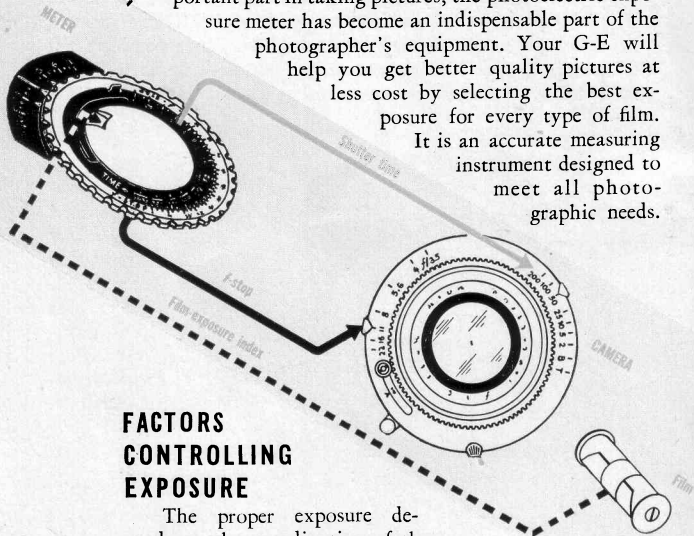
2 **SET** the trident in alignment with the meter pointer by turning the *f-stop dial*. See page 12. The light value is then automatically interpreted into exposure settings on the dials.

3 **READ** the dials. Any combination of shutter speed and *f-stop* appearing opposite each other will give proper exposure. Information on page 41 will help you select your camera setting.

Elements of Photographic Exposure

Because the correct measurement of light plays such an important part in taking pictures, the photoelectric exposure meter has become an indispensable part of the photographer's equipment. Your G-E will help you get better quality pictures at less cost by selecting the best exposure for every type of film.

It is an accurate measuring instrument designed to meet all photographic needs.



FACTORS CONTROLLING EXPOSURE

The proper exposure depends on the coordination of three important factors.

1 **Film-exposure index** defines the film's relative sensitivity to light. The faster the film,

the higher its number. For example, an exposure index of 50 is assigned to a film which has twice the sensitivity (speed) of a film with an exposure index of 25.

The G-E Film Value Leaflet GED-744, furnished with your meter, lists exposure indexes for practically all U.S. films.

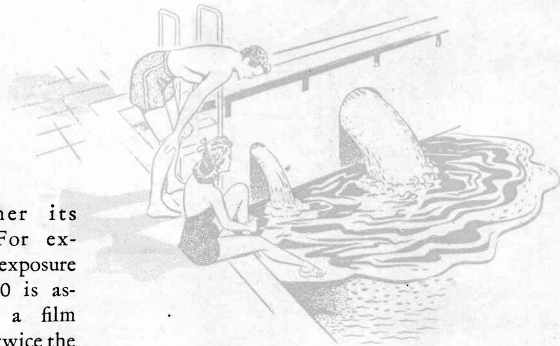
Since there is more red in tungsten (T) light than there is in daylight (D), all films are rated with the two values.

2 **f-stops** control the amount of light that is allowed to enter the camera by changing the size of the lens aperture. Low f-numbers indicate large diaphragm openings; high f-numbers refer to small diaphragm openings.

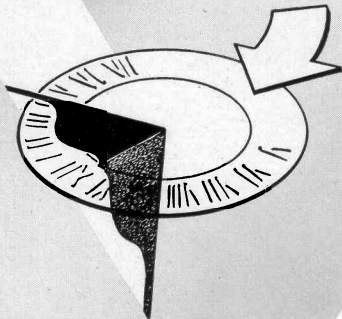
3 **Shutter speeds** regulate the length of time that light is admitted by the camera.

The analogy which follows illustrates the effects of these factors on exposure.

Consider the light entering the camera as a stream of



LIGHT X TIME = EXPOSURE



water flowing into a swimming pool. If the stream of water were small it would require more time to fill the pool than if the stream were large. Similarly, light entering a small opening in the diaphragm of the camera requires longer time to give the same exposure to the film than does light entering a large opening. Various

films have different sensitivities to light, just as various swimming pools have different capacities to hold water.

INCIDENT- AND REFLECTED-LIGHT MEASUREMENTS

There are two methods of light measurement by which proper exposure settings can be determined.

Reflected light • light reflected from the subject or scene to the camera. Measure by pointing your meter at the subject



or scene. (Examples are shown on pages 13 to 17.)

Incident Light • in this instance the light falling upon the subject is measured. (Examples are shown on pages 19 and 20.)

Personal preference and specific conditions will dictate the method best suited to your needs. The practical examples on pages 13 to 20 will serve as a guide to the development of your techniques.

The Trident Analyzer

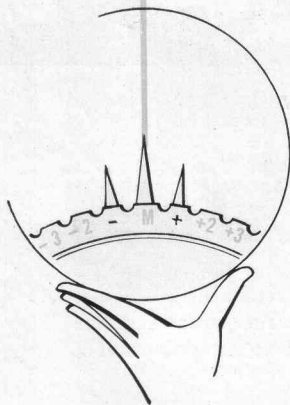
Accurate exposure measurements require proper analyzing of both the subject and the lighting. This, you can accomplish by the use of the trident.

The trident is a unique analyzing device which is exclusive with your G-E exposure meter. It has three tines (or teeth) each of which has a specific use, in the operation of your meter. Generally, the (M) or mean tine should be aligned with the meter pointer.

The (+) tine is used for increasing the exposure by one *f*-stop and the (-) tine is used for decreasing the exposure one *f*-stop.

An additional device for exposure calculation is provided by the spacing of the projections on the outer dial which are spaced at one *f*-stop intervals. This feature facilitates scanning, light balancing, and selection of the best exposure for unusual scenes.

The examples on the following pages show you which settings to use. Detailed information is also given in the tables on reflected- and incident - light measurements on pages 18 and 20.



Exposure by Reflected Light



ONE



Practically all outdoor exposures can be measured by pointing the meter at the subject or scene. Hold the meter approximately level at the camera position and point in the same direction as the camera is pointing.

Other Useful

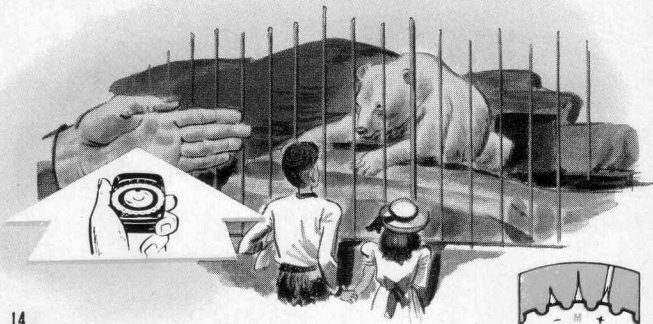


TWO

In photographing people, a good exposure is obtained by making a close-up reading on the face. This method gives proper exposure to the actual subject and the measurement is not influenced by background details.

THREE

If the subject is inaccessible, objects in the same illumination which have like characteristics may be substituted. For example, when it is not convenient to make a close-up reading, make a measurement on the palm of your hand. Should the subject be in a shadow, hold the hand in a shadow also.



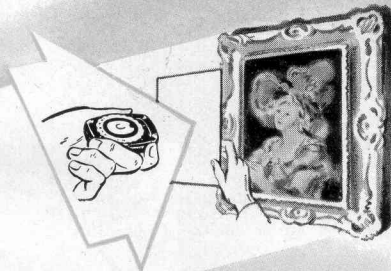
14

Methods for Measuring

FOUR

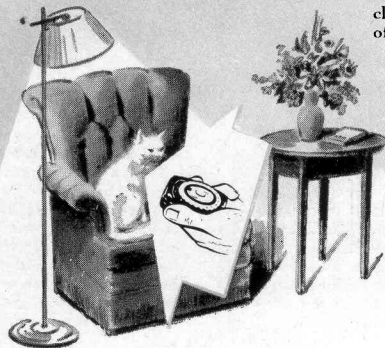
Reflected Light

To determine the proper exposure for copying, take a close-up reading on a white card held in the copy position. Use T* exposure index as given in your Film Value Leaflet (GED-744) or divide the regular exposure index by five.



FIVE

A small subject, of a different brightness than the background, should be measured close-up. Hold the meter close to the main center of interest.



15

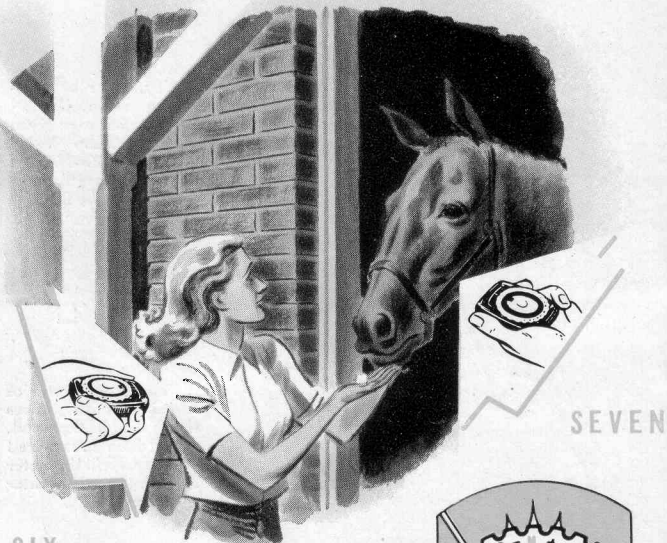
Scanning

Measurement of the brightness of different parts of a scene is called scanning.

The trident facilitates scanning of scenes for improving tone or color reproduction. In *color photography* take close-up readings of the lightest and darkest objects of importance. Set the (M) tine midway between these readings. Color film will record proper color of objects with brightness readings falling between the (+) and (-) tines.

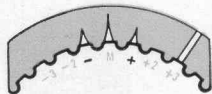
With *black-and-white film* the scene may be scanned by taking close-up readings on the lightest and darkest objects. The brightness range of the scene in terms of *f-stops* is the difference between the extreme pointer positions as illustrated.

A few films have latitude of about 1000 to 1 which corresponds to approximately -5 to +5 *f-stops*. The relationship of scene brightness ranges in *f-stops* and their equivalent numerical ratios is given on the following page.

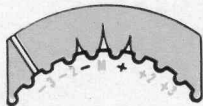


SEVEN

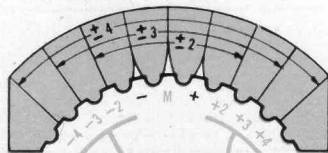
SIX



Lightest-object method—take a close-up reading of the lightest portion of the scene that is in the brightest light. This method is most useful when minimum exposure for highlights is required with- out sacrificing shadow detail.



Darkest-object method—take a close-up reading of the darkest part of the subject that is in the shadow. This method is most useful when shadow detail must be included in an exposure for a scene of great brightness range.



Sometimes it will be necessary for you to change scales to evaluate measurements which cover both HIGH and LOW light-range settings. The relationship to the right may be used to evaluate the scale readings.

<i>f</i> -STOPS	NUMERICAL RATIOS
-1 to +1 (Times).....	4 to 1
-2 to +2	16 to 1
-3 to +364 to 1
-4 to +4256 to 1
-5 to +51024 to 1

LOW scale 1 2 3 4 5 6 7
 Equivalent HIGH scale .5 6 7 8 9 10 11
 (add 4 to LOW values)

For example, if the extreme readings are 3 on the LOW scale and 5 on the HIGH scale, the brightness range is $(5 + 4) \div 3 = 6$ *f*-stops. The mean setting of the (*M*) tine is midway between the two extreme readings, or $5 + 4 + 3 \div 2 = 6$ on the LOW range.

Another method of obtaining the average exposure reading is to select the shutter speed which you want to use and note the *f*-stops opposite the (*M*) tine when the trident is aligned with the pointer in the two extreme positions. An *f*-stop midway between these two extreme values will then give proper exposure.

TABLE OF REFLECTED-LIGHT MEASUREMENTS

1 Point meter at scene from camera position:

	TRIDENT ANALYZER SETTING (As explained on page 12)		
	Front Lighting	Side Lighting	Back Lighting
a Average subjects with average background	M	+	+2
b Dark subject with dark background	M	+	+2
c Light subject with light background	M	+	+2
d Light subject with dark background	-	M	+
e Dark subject with light background	+	+2	+3

2 Make close-up reading on:

a Center of Interest for	M	M	M
	Average object	+	+
Face or light object (palm of hand*)	+	+	+
Dark object	+	+	+
b Lightest object in highlight	+3	+3	+3
c Darkest object in shadow	-3	-3	-3

*Use (*M*) tine if subject is very light and +2 position if subject is very dark.

Exposure by Incident Light

Exposure measurements by incident light are made by reading the illumination falling on the subject. This method is highly dependable and requires the least thought and study.

When measuring incident light, always use the incident-light attachment.



You can measure incident light by holding the meter near the subject and pointing toward the camera. The incident light can be measured from any convenient position where the illumination is the same.

Key Light Measurements



NINE

Incident light may also be determined by measuring the key light. Point the meter at the brightest (key) light source from the subject position.

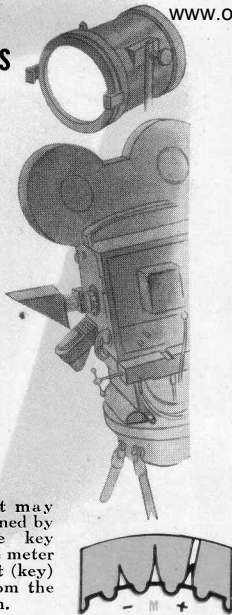


TABLE OF INCIDENT-LIGHT MEASUREMENTS

(Use incident-light attachment)

1 Meter at subject position pointing toward the camera (see page 19)

- a Average subjects
- b Very light subjects
- c Very dark subjects
- d Snow scenes
- e Marine scenes

TRIDENT ANALYZER SETTING
(As explained on page 12)

Front Lighting	Side Lighting	Back Lighting
M	M	M
-	-	-
+	+	+
+	+	M
+	M	M

Table of Incident-light Measurements (Cont.)

2 Meter at subject position pointing toward key light (see page 20) †

TRIDENT ANALYZER SETTING
(As explained on page 12)

Front Lighting	Side Lighting	Back Lighting
+*	+**	+***
+	+ or +2	+2 or +3
+	+	+

a Average subject (studio)

b Average subject (sunlight)

c Average subject (no sun)

† Increase one *f*-stop for very dark subject; decrease one *f*-stop for very light subject.

* If key light is near camera use (M) tine.

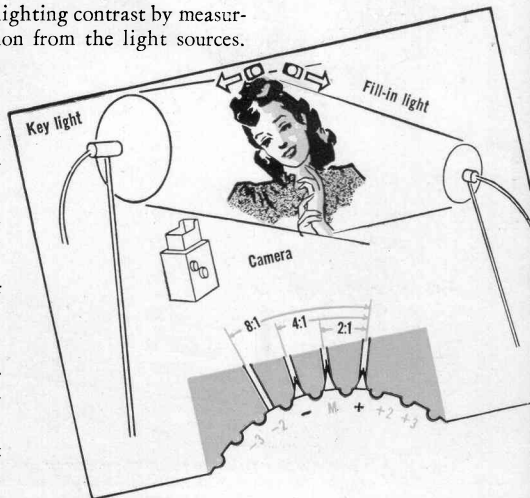
** This setting gives exposure for highlight.

*** This setting gives rim-lighted effect. For normal exposure use method 1 a.

Light Balancing

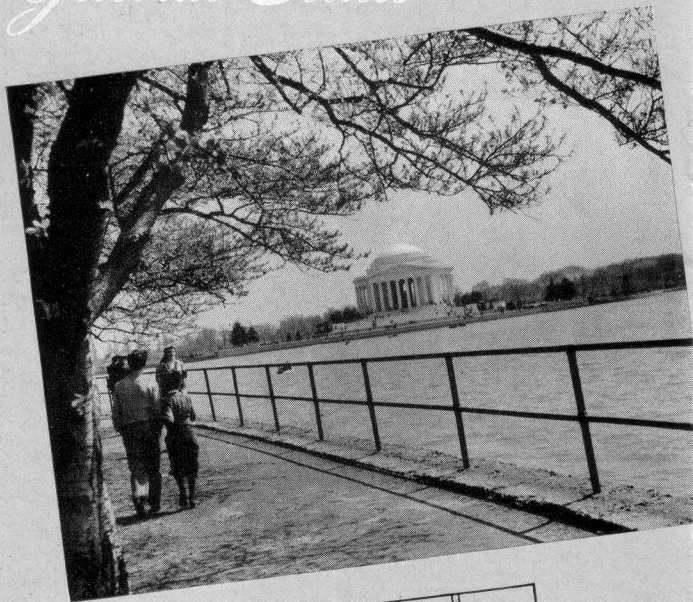
You can evaluate lighting contrast by measuring the illumination from the light sources.

- Put on the incident-light attachment and point the meter at the key light from the subject position.
- Lock pointer in position at measured light value.
- Align (+) tine of the trident with the pointer.
- Point meter at fill-in light and unlock pointer.
- Read the contrast ratios as illustrated.



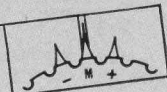
TYPICAL EXAMPLES OF GOOD EXPOSURES

General Scenes



**REFLECTED
LIGHT**

Point meter at
scene



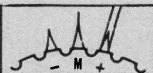
These photographs are for your guidance. You can obtain similar results if you'll use the methods suggested for each of these conditions. In several cases alternative procedures are given. Set the trident analyzer of your meter as indicated opposite the method of exposure measurement which you select.

Seascapes



**REFLECTED
LIGHT**

Point meter at
scene



**INCIDENT
LIGHT**

Point meter at
sun






Scenes with
Contrasting Light





Scenes with
Contrasting Subjects

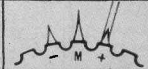
**REFLECTED
LIGHT**

Take reading on darkest object	
Take reading on lightest object	
Average of lightest and darkest readings	


**INCIDENT
LIGHT**

Point meter at camera	
Point meter at sun	

**REFLECTED
LIGHT**

Point meter at scene	
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**INCIDENT
LIGHT**

Point meter at camera	
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