# TAKING INCIDENT LIGHT READINGS



Your Master IV can be converted to read incident light simply by attaching the Weston Invercone.





# Attaching the Invercone

For most indoor and outdoor pictures where illumination is relatively low, open the exposure meter baffle and slip the Invercone into place, as shown. Where the level of illumination is high, close the baffle and slip the Invercone into place over the baffle.

## Using the Invercone

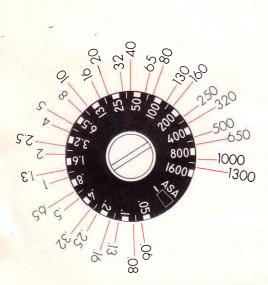
With the Invercone attached, stand at the subject you are going to photograph and point the meter at the spot from which you are going to take the picture. The exposure meter settings are then selected the same as when taking reflected light readings. If the subject is inaccessible a substitute reading can be taken at the camera position providing the illumination is the same as on the subject.



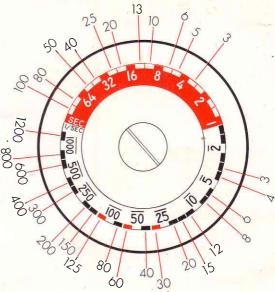
# Values of Unnumbered Blocks on the Meter Exposure Control Dial

The unnumbered blocks on the Light Scale, Lens Opening (f/stop) Scale, and

the Shutter Speed (Time) Scale have definite values but to show them all on the scales would make them appear very congested. The values of these unnumbered blocks are shown in the following illustrations.

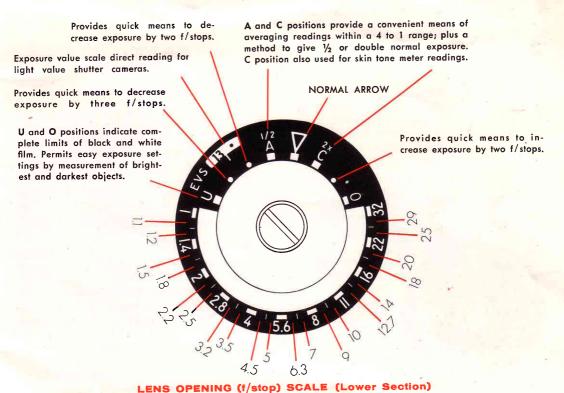


LIGHT SCALE



SHUTTER SPEED (TIME) SCALE

### LENS OPENING (f/stop) SCALE (Upper Section)





## **MOVIES and your MASTER IV**

Any of the methods of determining exposure described for still cameras can be used for movie cameras. For correct exposure first determine the exposure index of the film from the film manufacturer's data sheet, and the constant shutter speed of your camera at the normal framing speed from your camera instruction book.

Set the exposure index in the Exposure Index window. Aim the meter at the scene and note the reading. Now set the meter arrow at this reading on the light scale of the exposure control dial the same as you would for still cameras. Just below your camera shutter speed on the dial will be found the correct f/stop.



#### **EXAMPLE**

Assume that your camera operates at 1/30 second at 16 frames per second. The 1/30 second on the shutter speed dial of the meter is indicated by the red block adjacent to the numbered 1/25 second.

Assume an Exposure Index of 10, a shutter speed of 1/30 second at 16 frames per second and a light reading of 200. With the meter arrow set at 200, the correct f/stop (f/8) will be found directly below the 1/30 second red block on the shutter speed dial. Therefore, the scene will be filmed at 16 frames per second at f/8.

Note: If your camera operates at 1/40 second, use the black block adjacent to the 1/50 second.

# CAMERA WITH ADDITIONAL FILMING SPEEDS

If your camera can be operated at filming speeds other than 16 frames per second and you wish to shoot at a speed other than 16 FPS, the corresponding shutter speed required may be determined from the table.

0.00	ALLE STREET	CHECK	TIME	SECONDS
FPS	SHUITER	SPEEDS	HN	3ECOMP3

8	(1) 1/15	(2) 1/20	(3) 1/25
12	1/20	1/30	1/40
16	1/30	1/40	1/50
24	1/40	1/60	1/80
32	1/60	1/80	1/100
48	1/100	1/130	1/150
64	1/130	1/150	1/200

FOR EXAMPLE: Find the shutter speed at 16 FPS for your camera from your camera instruction book. Then locate this number (underlined) in one of the columns (1), (2), or (3). The required shutter speed for different FPS speeds will be found in the same column.

# HOW TO INCREASE OR DECREASE EXPOSURE

It may be necessary to either increase or decrease the indicated exposure for special effects or under unusual light conditions. Since the f/stop scale markings are one full f/stop apart, the exposure can be increased one full f/stop by turning the outer control dial to the next lower number. To decrease the exposure, turn the dial to the next higher number.

Shutter speed 1/50 second, f/8
Increase one f/stop, 1/50 second, f/5.6
Decrease one f/stop, 1/50 second, f/11



## HOW TO ALLOW FOR FILTERS

A simple way to compensate for the increased exposure required when using filters is to divide the exposure index by the filter factor.

#### FOR INSTANCE:

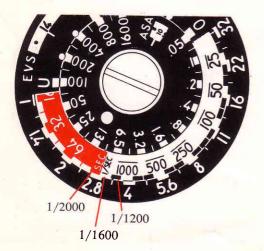
Exposure Index  $\frac{100}{2} = \frac{50}{50} = \frac{100}{2}$  Exposure Index to set on your camera

# Extending Ranges Beyond 1/1000 Second and f/32

If it is desired to shoot at shutter speeds faster than the 1/1000 second indicated on the meter dial, or at an aperture above f/32, these ranges can be extended in the following manner.

## SHUTTER SPEED (TIME) SCALE

Three additional shutter speeds higher than 1/1000 second are available. The black block above 1/1000 second indicates a shutter speed of 1/1200 second; the white (1/sec) block, 1/1600 second; and the red (SEC) block, 1/2000 second.



#### FOR EXAMPLE-

Assume your meter reading indicated a shutter speed of f/4 at 1/1000 second, as illustrated. Then, the black block would indicate a shutter speed of 1/1200 second at f/3.5; the white (1/sec) block would be 1/1600 second at f/3.2; and the red (SEC) block 1/2000 second at f/2.8.

Note: Refer to Values of Unnumbered Blocks on page 18.

## APERTURE (F/STOP) SCALE

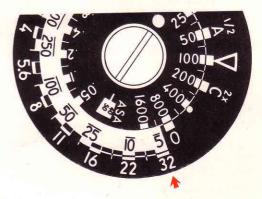
This scale can be extended beyond f/32 in full f/stops (f/45, f/64, f/90) to f/128.

#### FOR EXAMPLE-

Assume your meter reading indicated a shutter speed of 1/10 second at f/32, as illustrated in Fig. 1. If you desire to shoot at f/45, move the normal arrow (which is now opposite the 200 on the light scale) three blocks counter clockwise to 100, see Fig. 2. This will place the f/32 below the 1/5 second on the shutter

speed scale. Now, assuming f/32 to be f/45, the corrected exposure will be f/45 at 1/5 second. Each additional movement of the normal arrow three blocks counter clockwise will provide the next smaller f/stop number with its corrected shutter speed.





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## EXPOSURE FOR SPECIAL EFFECTS

High Altitudes — There is considerable ultraviolet radiation present at high altitudes to which films are sensitive. To eliminate this effect it is always good practice to use a haze filter. No exposure correction is necessary so use the meter in the regular manner.

Snow, Beach and Water Scenes — Take readings of the brightest and darkest objects and use the f/stop midway between, or take a reading from the palm of your hand and use the "C" position on the control dial. Best snow texture results when the snow is back —or cross lighted.

Copy Work—When copying pages of a book or photographs in black and white or color take a reading from a white card placed over the subject. Divide the exposure index by five and set this value in the Exposure Index window. Point the arrow at the light reading obtained and select the camera settings in the usual manner.

**Television** — Adjust the television screen for contrasty black and whites. Place the camera on a tripod, set the shutter at 1/25 second and focus on the lines across the screen. Dim the room lights. Take a close-up average reading holding the meter about six inches from the screen. Set the meter arrow at this reading and select the camera settings in the usual manner.

**Sunsets and Silhouettes** — Aim the meter directly at the subject and set the meter arrow at the reading.

Measuring Room Illumination — To determine the foot-candles of light falling on any surface such as a writing desk or work bench, take a reading from a piece of white paper lying on the surface you want to measure. Multiply this reading by four to convert from candles per square foot to foot-candles. **EXAMPLE:** If the meter reads 13 this means that the surface has a brightness of 13 candles

## AND UNUSUAL CONDITIONS

per square foot. Multiplying this by four gives you 52 foot-candles.

Aerial Pictures — To prevent the sky from inflating the reading, aim the meter down toward the ground. In general, below 1,000 feet use the meter reading indicated; from 1,000 to 2,000 feet stop down 1/3 f/stop; from 2,000 to 4,000 feet close down 1/2 f/stop; above 4,000 feet close the camera aperture one full stop from the reading. Use a Skylight Filter with daylight color film, no exposure correction is required.

Overcast Scenes frequently lack contrast due to diffused light and absence of shadows. In such situations black and white pictures can be improved by using the "A" position on the meter rather than the normal arrow when scene brightness is measured from the camera position.

Key and Fill Lights — For normal results in studio photography, the lighting contrast

range should be limited to 8:1 for color, and 64:1 for black and white. This means that the key light for color should produce no more than 8 times the light falling on the subject than the fill lights, and for black and white the key light should produce no more than 64 times the fill light.

To determine the ratio of key light to fill light, insert the Invercone in the exposure meter, stand at the subject's position, and measure the light produced by the key light by aiming the Invercone at this light, with all other lights turned off. Now turn off the key light and measure the light produced by the fill light. If the ratio is greater than the suggested limits, move the lamps near to or farther away from the subject, as required.

Contrasty Scenes — Occasionally scenes metered from the camera position will be excessively contrasty. Exposure for black and white pictures can be improved by doubling the exposure indicated by placing the "C" posi-

tion opposite the brightness reading. Remember, "C" stands for contrast, so use the "C" position for contrasty pictures.

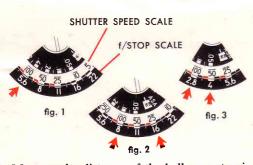
Absence of Contrast — For scenes with little or no contrast, being metered for black and white film from the camera position, set the "A" on the meter opposite the reading obtained. This will halve the exposure and result in a better print. Remember, "A" stands for absence of contrast.

**Flash Outdoors** can be used to illuminate shadows, especially of backlighted subjects. For natural looking results the flash fill-in should be only a secondary source. Use blue bulbs with daylight color film. Check the flash lamp carton and find the guide number. Aim the meter at the scene and determine the f/stop. Now divide the flash guide number by the f/stop number to get the proper flash distance from the subject. This will provide a 2 to 1 ratio, with the sunlight being twice as strong as the flash.

**EXAMPLE:** Assume a flash guide number of 90, an f/stop of 10, then  $90 \div 10 = 9$  feet. If the distance from lamp to subject is too great for convenience, place a handkerchief over the flash reflector and move the flash 1/3 of the way toward the subject.

**Extended Bellows** — Where the subject to lens distance is less than 8 times the focal length of the lens a corrective shutter speed must be computed. In this computation, if the focal length of the lens is given in millimeters convert it to inches by dividing the focal length by 25 (1 inch = 25 mm).

**EXAMPLE:** Assume your lens has a focal length of 8", and you are shooting at a shutter speed of 1/100 second at f/5.6 (See fig. 1). Using the f/stop numbers as focal length numbers, (take f/8 to be a focal length of 8") place the 8 on the f/stop scale below the 1/100 second shutter speed (See fig. 2).



Measure the distance of the bellows extension (lens to film distance). Assume this distance to be 16". Now look on the f/stop scale and find the number 16 and directly above on the shutter speed scale will be found 1/25 second. This new shutter speed (1/25) should be used with the f/stop selected previously (f/5.6). Align these two values on the meter dial and any of the exposure combinations aligned may be used, i.e., 1/50 sec., f/4; 1/100 sec., f/2.8, etc. (See fig. 3).

Reflections — Correct exposures for reflec-

tions in store windows, mirrors, etc. can be readily determined with your Master IV. Take a substitute reading from the palm of your hand held as near the reflecting surface as possible and set the "C" position on the meter to this reading. Remember that the proper focusing distance for the reflection is the distance from the camera to the reflecting surface plus the distance from this surface to the object being reflected.

Available Light — Occasionally scene brightness will be too low to obtain a reading from the camera position. In situations such as this take a close-up reading from the brightest object in the scene. If no object in the scene is bright enough to produce a reading, substitute a piece of white paper or a handkerchief adjacent to the brightest object and take a close-up reading from the paper or handkerchief. Set the "O" position to the light reading obtained and select camera settings in the usual fashion.

#### A WORKING TEAM

It is possible that slight errors in camera shutter speeds, lens calibrations, as well as exposure meters may be additive and result in consistently over- or under-exposure.

Your camera and exposure meter should be tested together as a working team by making trial exposures of the same scene at different exposure indexes to determine if any compensation is necessary.

If your pictures indicate equipment errors change the listed exposure indexes, lowering them if consistently underexposed and raising them if overexposed.

#### ZERO CORRECTOR

A wise precaution is to check the position of the meter pointer once in a while to be sure it returns to zero when all light is excluded from the photo-electric cell.

To set the pointer, cover the cell with your hand or a card and turn the zero corrector until the pointer is directly over zero on the light scale.

### CARE OF YOUR METER

Although ruggedly constructed, your meter is a precision instrument and should receive the same careful handling as you would give any good camera. Normal temperatures and humidity will not harm the meter but temperatures in excess of 130°F, which you might find in the glove compartment of a car, may affect the meter's accuracy.

## **Leather Carrying Case**

Your leather carrying case will help prevent scratches from marring your Master IV and will also give some protection against shock.

## REPAIR SERVICES

Your meter is ruggedized to give you many years of accurate and dependable service. However, should it be damaged and fail to operate, return it to your dealer or, if not convenient, send it directly to:

EAST COAST AREA

DAYSTROM, INCORPORATED WESTON INSTRUMENTS DIVISION SERVICE DIVISION

2530 Polk Street Union, New Jersey

Attach an identification tag clearly showing your name and address. Careful packing is important to prevent further damage during shipment. To avoid delays in handling please do not send instruction books, carrying cases and other accessories with the meter.

## WEST COAST AREA

DAYSTROM, INCORPORATED WESTON INSTRUMENTS DIVISION SERVICE DIVISION

736 Monterey Pass Road Monterey Park, California DAYSTROM, INCORPORATED WESTON INSTRUMENTS DIVISION SERVICE DIVISION

1125 Marshall Street Redwood City, California