

INSTRUCTION BOOK

for the Model S74/715

WESTON MASTER EXPOSURE METER



A Guide to Perfect Exposures

**ADDITIONAL COPIES OF
THIS INSTRUCTION BOOK
ONE SHILLING EACH**

INTRODUCTION TO METERED PHOTOGRAPHY

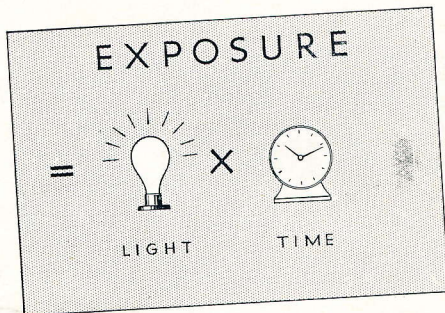
Brightness

Your exposure meter is designed to measure reflected light or brightness and not incident light. It is the reflected light which strikes the film in your camera and thus affects the exposure of the film. Both the incident light (i.e. the light falling on the subject) and the reflected light (or brightness) vary from scene to scene.

You can guess at exposures and get passable results and even good results on occasions. This is because some average subjects come within the margin of error from the correct exposure which modern films allow. But the eye is not a light measuring device which produces infallible judgement of correct exposures. Consider the brightness of your subject with the eye by all means, but use your exposure meter to measure that brightness with scientific accuracy to obtain real quality in your photographs.

Exposure

Exposure is the product of the length of time the light from the scene acts on the film, multiplied by the amount of light striking it. At all times this product should be approximately the same for the same film. If the amount of light is small, the time would be long; if the amount of light is large, the time would be short.



Controls of Exposure

Since the light reflected from the scene is the light which will fall on the film, camera adjustments are necessary to compensate for changing scene light. The controls of exposure are the f/stop and the shutter speed. The f/stop controls the amount of light and the shutter speed the length of time light acts on the film. The lower the f/stop number, the larger the aperture. On most cameras where the lens is mounted in the shutter, shutter speeds written as 2, 5, 10 are fractions of seconds, 2 being $\frac{1}{2}$ etc.

HOW TO USE YOUR

Film Speeds

Your "Master" meter is a photo-electric instrument which measures the reflected light of the subject with scientific accuracy. The exposure dial converts the light readings into the correct exposure combinations. Since emulsion speeds differ from one type of film or plate to another and for different kinds of illumination, make sure that you use the correct number on the list of "Weston Film Speed Values" supplied with the Meter.

1. Set for Film Speed

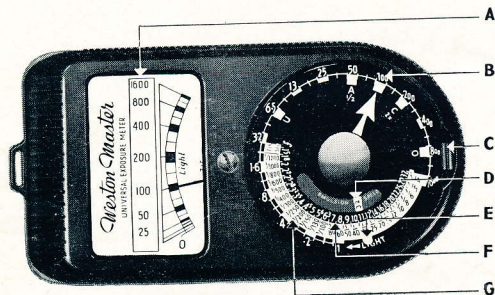
Depress catch "C" then turn tab "E" until the Weston speed number of your film appears in window "D."

2. Take a Light Reading

Aim the meter at the scene and note reading on light scale "A." Turn the exposure dial until its Arrow points to the same figures as the light reading. See example at "B."

3. Make Camera Settings

The correct settings for your camera now lie directly opposite each other—the f/stop (lens opening) settings are on row "F" and the shutter speeds (time) are on row "G." Any suitable combination of these figures may be selected, providing they are directly opposite each other, and will result in a correct exposure (see Selecting the f/stop on Page 4).



- A. Light scale recording light value of scene.
- B. Figures on exposure dial corresponding to above.
- C. Catch to release dial for film speed settings.
- D. Window indicating film speed setting.
- E. Tab to rotate dial for film speeds.
- F. Figures indicating f/stops (lens apertures).
- G. Figures indicating shutter speeds (time).

WESTON MASTER METER

4. Unnumbered Divisions

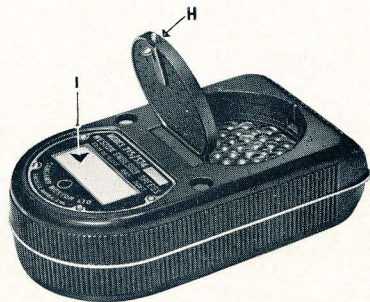
When the pointer of the light scale lies on an unnumbered division or block, set the Arrow of the exposure dial in just the same way to the corresponding unnumbered division or block on the exposure dial.

5. High Light Scale

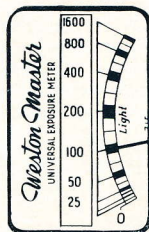
On the rear of the meter a hinged baffle will be found. The light sensitive photo cell is directly beneath this baffle. When the baffle is closed, the High Light scale is in use. This scale measures from 0 to 1600 candles per square foot and is for use for all average and brightly lighted subjects. Keep the baffle closed if the light reading is 50 or higher.

6. Low Light Scale

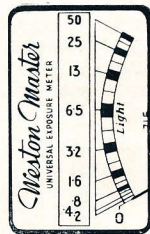
When the light reading is less than 50, open the baffle by releasing latch "H" and turn it back against the case so that the latch engages holding it wide open. The Low Light scale automatically appears measuring from 0 to 50 candles per square foot. The first division .2, or 1/5th candle per square foot, is a very low order of illumination even for indoor scenes.



H. The baffle half open and the release latch "H."
I. Ivory tablet on which to write film speeds.

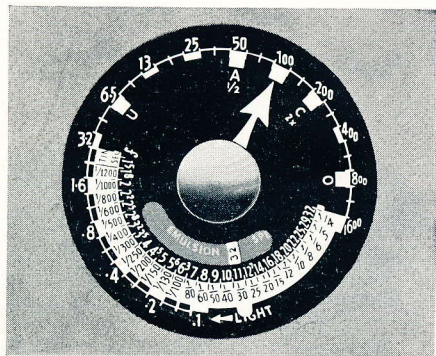


J



K

J. High Light Scale 0-1600 candles per sq. ft.
K. Low Light Scale 0-50 candles per sq. ft.



Direct Reading Feature

A useful feature of the Master Meter is that with the baffle closed and at the following Film Speed and f/stop values, the light reading is a direct indication of the shutter speed required e.g. when the pointer indicates 100, the shutter speed required is 1/100th sec., etc.

<i>Film Speed</i>	<i>f/stop</i>
24	f:5.6
32	f:6.3
50	f:8
100	f:11
200	f:16

Four

SELECTING THE F/STOP

For each picture you take you have the choice of a number of different exposure combinations of f/stop and shutter speed. As the exposure dial is set on this page you might select an f/stop of f:6.3 at 1/100th sec. or an f/stop of f:22 at 1/8th sec. Any one of the combinations shown on the dial would result in a correct exposure (providing the figures taken were directly opposite each other) but the selection of the correct combination depends upon the requirements of the subject.

If the scene is an action one, select a fast shutter speed and use the f/stop directly opposite. If maximum depth is needed, then you can select a slower shutter speed with its corresponding smaller stop opening. Remember that the smaller the f/stop, the higher the f/stop number . . . also that more of the objects will be in sharp focus when smaller stops are used.

In close ups or very near subjects, bear in mind that the depth of field covered by the lens is considerably reduced and that in order to obtain sharp definition over the parts of the subject nearest and most distant from the camera, the smallest possible f/stop should be used.

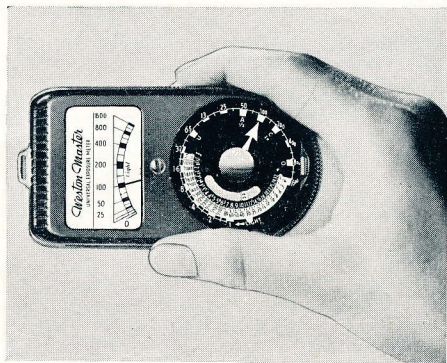
CLASSIFICATION OF SCENES

It will simplify the classification of scenes to remember that the exposure meter measures the average value of the light or brightness coming from the entire scene. Thus for normal exposures the Arrow position on the exposure dial is used. For scenes requiring less than normal exposure an "A" position is provided; for those requiring more, a "C" position is provided.

Flat scenes lacking in contrast, such as distant views and landscapes on dull days, generally require less than normal exposure and more than normal development for best reproduction. Set the "A" position on the exposure dial opposite the light value measured for such scenes.

The contrast scene such as a sunlit street with dark shadows for best reproduction requires more than normal exposure and less than normal development. Set the "C" position on the exposure dial opposite the light value measured for these scenes.

Remember, however, that about eighty per cent. of all scenes require a normal exposure and when in doubt about any scene, use the Arrow position on the exposure dial.



Aiming The Meter

Aim the meter as shown above, looking across the top of the case at the subject. Tilt the meter slightly downwards to avoid measuring the sky, which, being very much brighter than the rest of the subject will "inflate" the reading, resulting in under exposure. See that the photo-cell is not obstructed by your fingers or the neck cord.

When making close up readings, make sure that you do not cast a shadow with the meter or with your hand on the object being measured.



CAMERA POSITION METHOD

The normal method of use of the meter is at the camera position i.e. close to the camera. It is a simple method and the one used most frequently by photographers. This method gives a correct exposure for the overall scene and does not isolate any particular object from an exposure point of view.

Make a light reading (avoiding sky areas) and set the exposure dial as already described. Choose a combination of f /stop and shutter speed consistent with the scene to be photographed. A fast shutter speed is required if there is action, or a small aperture (high f /stop number) if maximum depth of field is needed.

Generally, the Arrow position on the exposure dial should be used. For flat scenes, or for scenes with extreme contrast of highlights and shadows, use the "A" or "C" position as described on Page 5.

The camera position method should not normally be used for back-lighted snow, sand or water, since sparkling reflections can result in under exposure of the shadowed areas. (See Brightness Range Method). But for landscapes, general views and other photographs where a quick reading is wanted the camera position method is quite satisfactory.

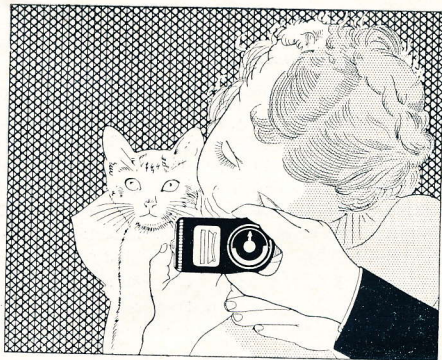
THE CLOSE-UP METHOD

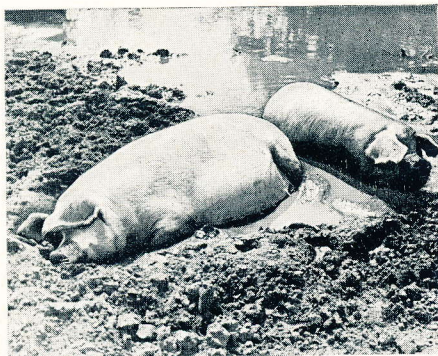
In the close-up method the meter is held close to the object being photographed. In this way the film is exposed particularly for the one object of interest and the background is subjugated accordingly.

Hold the meter close to the principal object, about as far away as the object's smallest dimension. The meter can be held closer than this distance, but not farther away. If the object is the face, 6 inches is sufficient. The distance can be increased to say 5 feet if it is desired to isolate a small group of people from the background, or even to 10 feet in the case of larger surfaces. Make quite certain, however, that no light reaches the cell from unimportant objects.

When making a reading, make sure that you do not cast a shadow on the subject with the meter or with your hand. Also do not let your body interfere with the natural illumination of the subject. To avoid casting shadows, the meter may have to be held at an angle to the direct light on the subject, i.e. you can measure the reflected brightness by standing slightly to one side.

Having taken a close-up light reading, set the exposure dial to the Arrow position and make your camera settings.





Substituted Readings

It is not always possible or convenient to take close-up readings. In such cases, substituted readings of nearly similar objects can be made. In the above example, a close-up reading of the hand would be a substitute for the pig's back and a close up reading of shadowy mud close by would suffice for the darkest object. Similarly, a white handkerchief can often be substituted for a white wall or a lady's blouse. But ensure that the lighting is the same and that the objects are similar, a tree for a tree and grass for grass.

Eight

BRIGHTNESS RANGE METHOD

The Brightness Range Method consists of measuring the light values of the lightest and darkest objects of the subject and thereby balancing the exposure midway between the two extremes. It is the most accurate method known for the determination of correct exposure and is recommended for the best possible negative from an exposure viewpoint.

In an average scene, various objects reflect different amounts of light—the dark objects little light, the bright objects much light. In a fine photograph, all objects should be correctly exposed and thus the above extremes should be measured.

Make a close-up reading of the darkest object (for example, a dark hedge) in the scene and note the light value. Then make a close up reading of the brightest object (for example, a white wall) again noting the light reading. If you are not sure which are the darkest and lightest objects measure several that appear so, and take the lowest and highest readings respectively.

Set the Arrow on the exposure dial midway between the darkest and brightest object light values, i.e. the Arrow should be the same number of divisions or blocks from the darkest light value, as it is from the brightest. You can then read off the correct combinations of f/stop and shutter speed for the scene.

THE "U" AND "O" POSITIONS

Most films can record a long range of brightness in any one subject, but there are limits to the range of deep shadows and bright highlights which can be recorded with reasonable truth in a single negative. A knowledge of these limits can prevent unnecessary loss of detail in extreme shadows or highlights when long range subjects are encountered.

The "U" and "O" positions on the exposure dial show the limits of subject brightness which the average film can record on a single negative, the ratio of these being about 128:1. For a given setting of the dial, all objects whose light values fall on or between these two limits will be correctly exposed. Any object having a light value below the "U" position will be under-exposed and any object with a light value above the "O" position will be over-exposed.

By setting the "U" position opposite the darkest object light value, the minimum correct exposure will result. If the "O" position is set opposite the brightest object value, the maximum correct exposure will be obtained. The Arrow position gives the normal exposure.

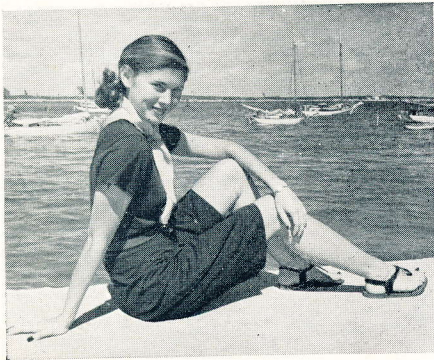
When movement in a scene dictates a minimum exposure, you can use the "U" position and although the densities on the negative will be as thin as is permissible, the exposure will still be correct. On the other hand, in a dark hall or cave, it might be impossible to obtain a reading from anything but the brightest object. By using the "O" position, the maximum range of the negative will be used and correct exposure obtained but the density will be increased.



Highlights and Shadows

In a scene such as the above, the brightness range greatly exceeds the film range i.e. the patches of sunlight may measure 500 candles per sq. ft. and the deep shadows 1 candle per sq. ft. The average film range is thus not wide enough to give details in both the highlights and shadows, although good average exposure can be obtained by using your meter as already described. According to the effect you require, however, you can choose to expose for details in the shadows by using the "U" position or, alternatively, for detail in the highlights by using the "O" position.

COLOUR PHOTOGRAPHY



Colour Film Range

The range of colour film is far more restricted than that of monochrome film. The permissible range of light values is approximately 4 to 1 and this range is covered by the "A" and "C" positions on the exposure dial. The "A" position represents the lower limit and the "C" position the upper limit. Thus after setting the dial for any scene, all objects whose light values fall between these positions will be correctly exposed. If any objects have a light value below the "A" position, they will be under-exposed and if any have a light value above the "C" position they will be over-exposed. This knowledge enables you to select the best exposure for the colours in which you are most interested.

Brilliance in colour photography is obtained through colour contrast and not from highlights and shadows as in black and white photography. The method recommended for best exposures is the Brightness Range Method described on page 8.

In colour work, black and whites should not be considered as colours, and should not be measured. First, make a close up reading of the darkest colour in the scene. Then take a close-up reading of the brightest colour. Set the Arrow position on the exposure dial midway between the light values of the darkest and brightest objects and make your camera setting.

The above method centres the exposure in the middle of the film range and is ideal for the average colour photograph where the colour contrast is low and flatly illuminated. If, however, the dark colours are of principal interest, set the "A" position on the Exposure dial opposite the darkest colour light value. Alternatively, if the brightest colours are of principal interest, set the "C" position opposite the brightest colour light value. These positions match the lower and upper limits of the film range respectively.

Usually the most pleasing colour pictures result from exposure for the brightest colours and remember that slight over-exposure gives better colour rendition than under-exposure. Avoid shadows and extreme contrast in lighting wherever possible.

CINE PHOTOGRAPHY

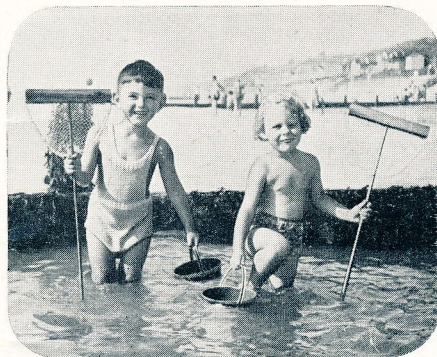
A cine camera is essentially the same as a still camera but it exposes a series of pictures in a given interval at a fixed shutter speed. For the best exposure results, the Brightness Range Method described on Page 8 is recommended.

Make close-up readings of the darkest and brightest objects in the scene and set the Arrow position midway between the light values obtained. The correct f/stop to use will then be found opposite the particular shutter speed of your cine camera. In panning the camera, watch the contrast in lighting and, if possible, first determine the correct exposure settings for each part of the scene, altering the f/stop when the camera moves from light to dark areas, etc.

The standard number of frames exposed by the average amateur cine camera is 16 per second at a shutter speed of 1/30th of a second. For other frames per second than 16, the shutter speed is proportional as shown in the following table :—

8 frames per second		1/15th
16	„ „ „	1/30th
24	„ „ „	1/45th (use 1/40th)
32	„ „ „	1/60th
48	„ „ „	1/90th (use 1/100th)
64	„ „ „	1/120th (use 1/130th)

Some cameras may have a different shutter speed at 16 frames per second, such as 1/40th or 1/50th, and the f/stop for these should be read off against this shutter speed on the exposure dial. If the shutter speed of your camera is unknown, ascertain it from the camera manufacturer.



Colour Cine Film

Follow the accompanying instructions and those given for still colour film photographs. Avoid extreme lighting conditions and allow the colour to provide all the necessary contrast. For outdoor shots, expose between 10 a.m. and 3 p.m. if possible as the quality of the light is normally best during that period. If the sun is shining it should be directly behind the camera. Watch the reflection values of the surroundings, i.e. a white dress can be turned pink by a red reflection. Avoid shadows and subjects in shadow. These are illuminated by skylight which is bluer than sunlight for which the film is balanced. In an ideal scene, the colour contrast is low, flatly illuminated and it is taken on a clear sunny day.



Back Lighted Subjects

If the meter is aimed directly at a back-lighted subject, i.e. one where the main lighting comes from behind, it is obvious that the light value reading can be inflated resulting in under-exposure. To overcome this, turn around and make the reading on a similar object with your back to the lighting. For example, in the above picture a close-up reading could be made of your hand for the girl's face or a handkerchief for her dress. This also applies to beach scenes where sand is back-lighted or sparkling snow scenes. Take the light reading on the snow or sand with the sun over your shoulder. Direct reflections from sparkling water should also be avoided when taking light readings. These instructions obviously do not refer to the position of the camera.

ADDITIONAL NOTES

Filters

Filters have a multiplying factor in relation to the film with which they are used and the exposure required must be increased accordingly. The easiest method of making this increase is to divide the filter factor into the Weston speed of the film and set the exposure dial on the meter with the resultant value. For example the filter factor, using a certain film, may be 2 and the film speed 100. Dividing 100 by 2, the result, 50, is used to set the film speed on the exposure dial.

Equipment Errors

Photographic equipment is sometimes subject to small errors, e.g., in shutter speeds and f/stops. Usually these errors cancel each other, but it is possible for them to be additive, resulting in consistently over- or under-exposed films. These errors can be compensated for by adjusting the listed film speeds, lowering them if results are consistently under-exposed and raising them if over-exposed.

Weston Film Speeds

Different developers have an influence on the effective emulsion speed value of a film. A note is made of this in the Weston Film Speed List.

CARE OF YOUR EXPOSURE METER

1. Your "Master" meter is rugged and well made but like a fine watch, which it resembles in many ways, it should be treated with all reasonable care.
2. If the pointer of your meter does not register zero when no light strikes the cell, it requires a slight adjustment. Cover the cell with your hand or a card and with a small screwdriver rotate the small screw on the front of the meter immediately adjacent to the light scale until the pointer rests on zero. Tilt the meter at an angle of about 45° when making the adjustment. Zero adjustment, however, is only very occasionally necessary and should be made with great care.
3. Do not leave the photo-cell exposed to strong sunlight for long periods. This treatment is harmful. Keep the meter in its case or box when not in use.
4. Do not drop the meter, otherwise its jewelled bearings may suffer.
5. Do not overheat the meter by leaving it on a hot radiator, etc. Normal temperatures or even abnormal summer temperatures will not harm the meter.
6. Your Master meter is moisture proof but not waterproof, so do not drop it in the lake.

If your meter is in need of repair, take it to your regular photographic dealer. If this is not possible, pack the meter very carefully and return it with details of fault to :—

Repair Department
SANGAMO WESTON LTD.,
Great Cambridge Road, Enfield, Middlesex, England.

SANGAMO WESTON LTD.,
Great Cambridge Road,
ENFIELD, MIDDLESEX,
ENGLAND.

THE **WESTON**
Master

UNIVERSAL EXPOSURE METER

MODEL S74/715

SANGAMO WESTON LTD.
ENFIELD MIDDLESEX