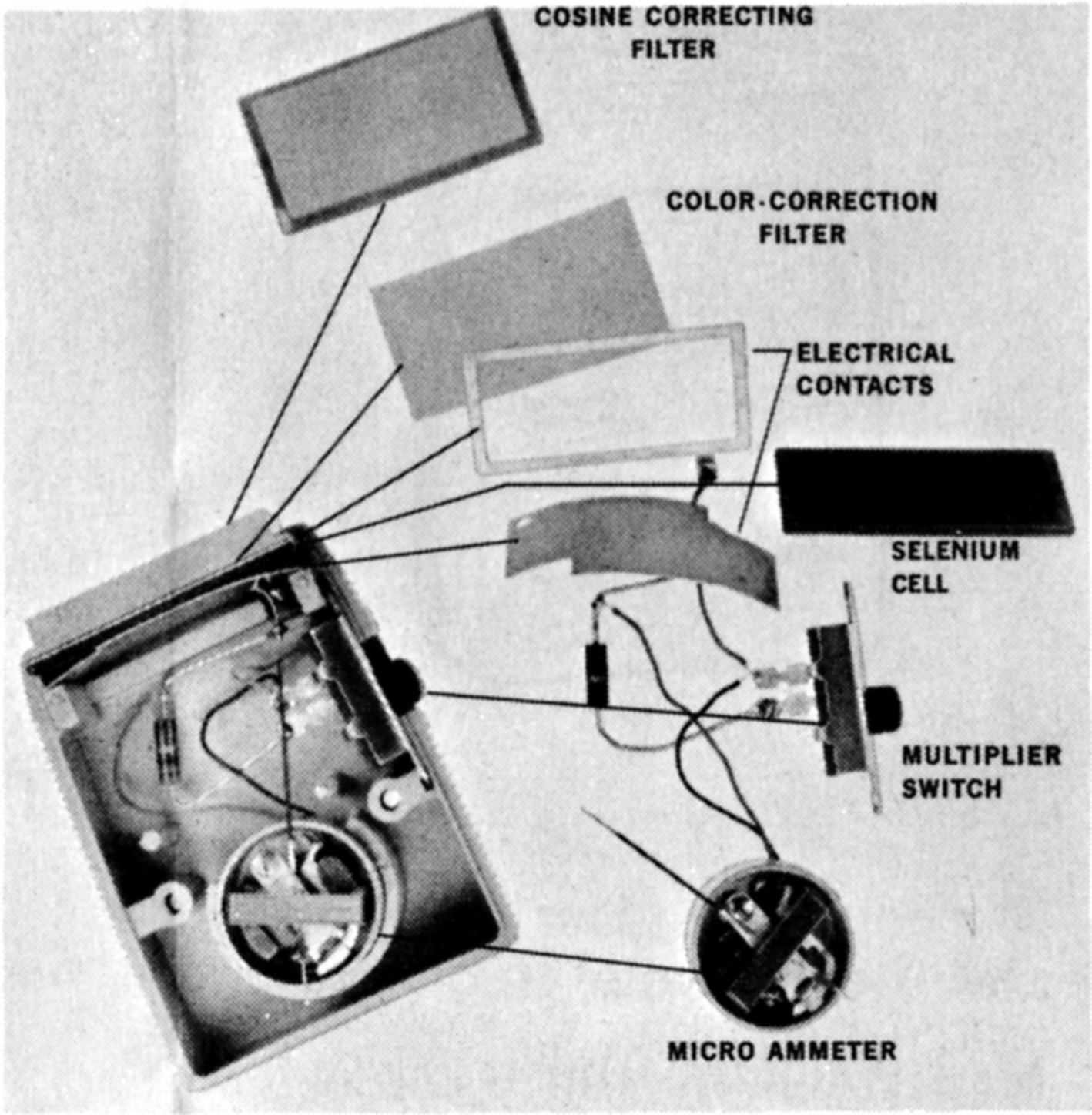
INSTRUCTIONS FOR USING

TYPE 213 LIGHT METER

LARGE LAMP DEPARTMENT

GENERAL ELECTRIC

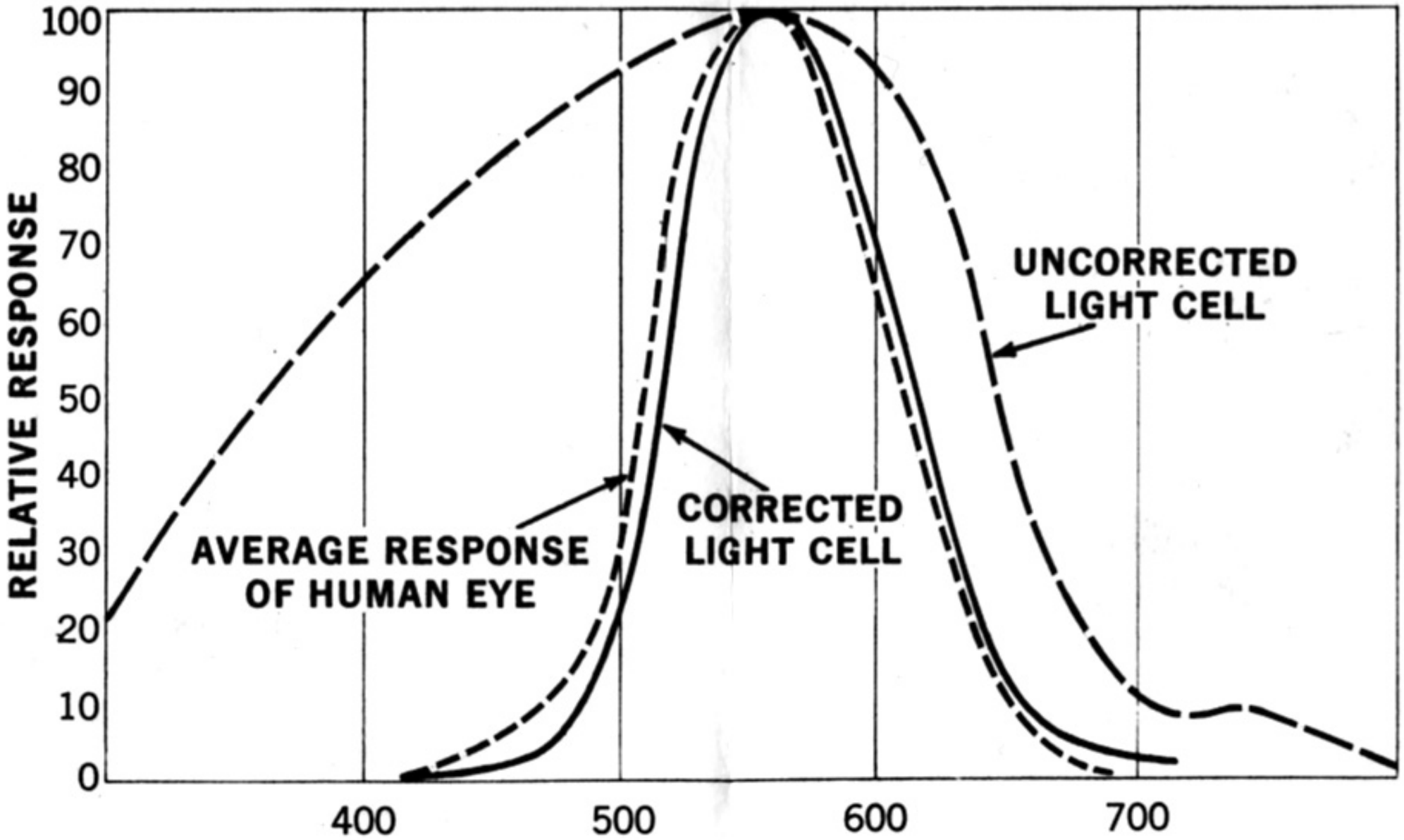
COMPONENT PARTS OF METER



The General Electric Type 213 Light Meter is a pocket-size, color- and cosine-corrected light indicating device capable of reading to 500 footcandles on its basic scale and to 5000 footcandles with the use of a built-in multiplying switch.

The meter element is of the logarithmic-response type that expands the lower part of the scale so that 50 footcandles is about mid-point on the 500-footcandle scale. This permits the basic scale to cover the range of lighting levels in most homes, schools, stores, offices, and industry.

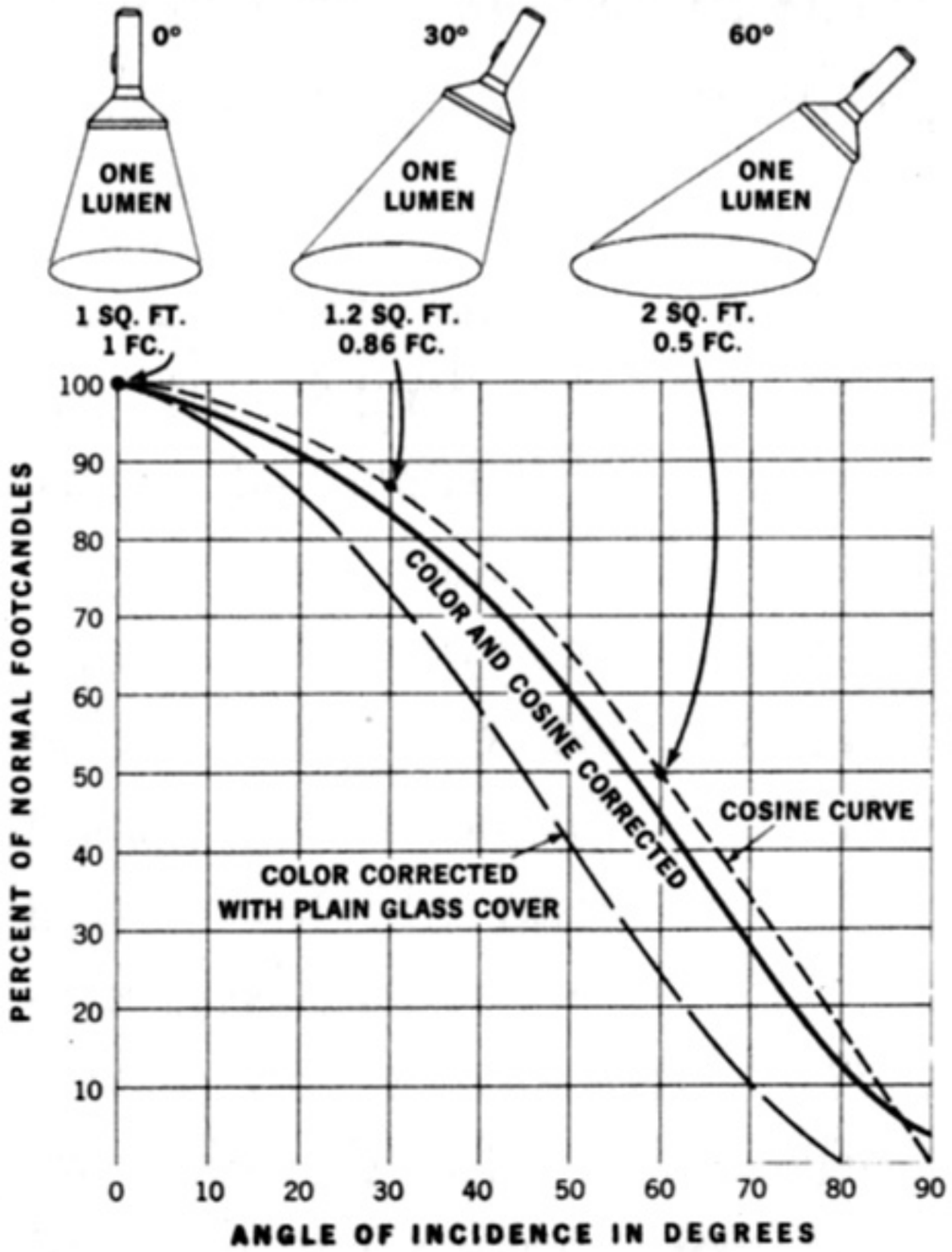
The extended range scale, 0-5000 footcandles, permits measurement of higher levels such as those found in spotlight beams, plant growth chambers, and daylight. In bright sunlight the meter may register off the scale.



COLOR CORRECTION

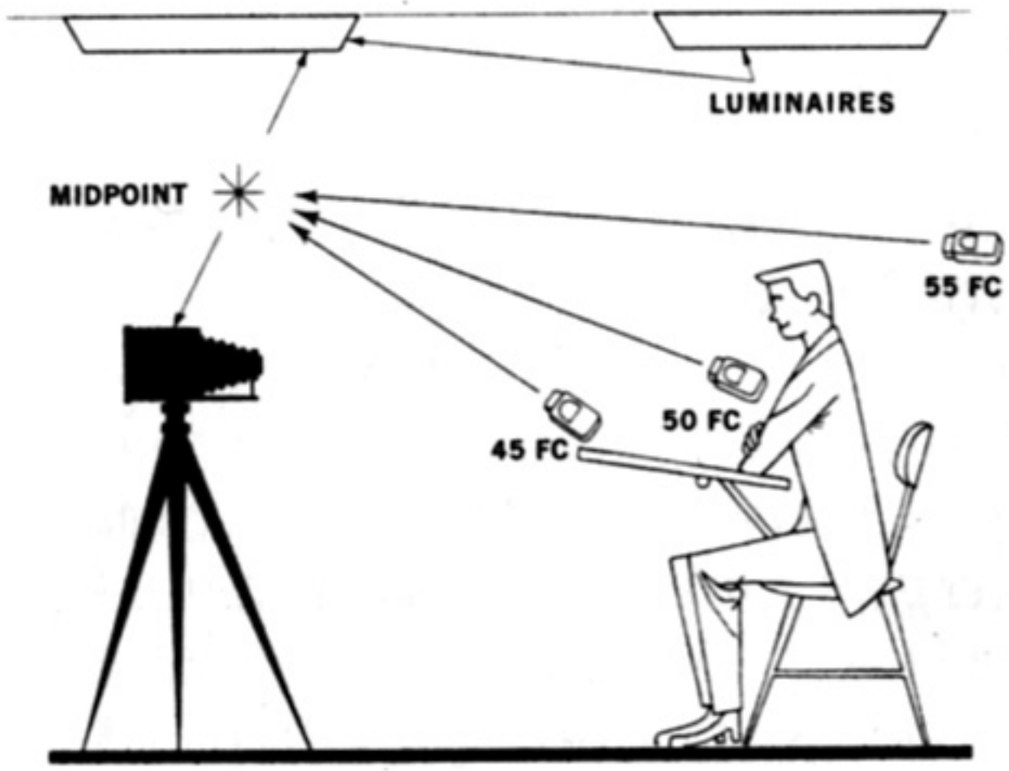
A color-correcting filter over the selenium cell evaluates any color of light essentially the way the eye "sees" it.

COSINE CORRECTION



A white plastic diffusing cover is used instead of glass to admit light properly into the cell.

READING METER FOR EXPOSURE TIME



AVERAGE READING 50 FC.

MEASURING EXPOSURE TIME

The Type 213 meter can be used to determine exposure time when photographing lighting installations in Kodacolor by measuring incident light on the important surfaces within the camera's field of view. As long as the incident light on these surfaces is within a range of four to one, the following formula will be effective.

FORMULA:

Kodacolor film — factor number, 100*
Lens Aperture — f.11

Average footcandle reading on the important surfaces with meter cell aimed at midpoint between camera and principal light source—(50 footcandles in example).

$$\text{Exposure time at f.11} = \frac{\text{Factor Number}}{\text{Avg. footcandles}} = \frac{100}{50} = 2 \text{ seconds}$$

When the reflectances of important surfaces are very bright (above 70 per cent reflectance), the exposure time should be cut in half. If they are very dark (below 10 per cent reflectance), the exposure time should be doubled.

* Factor number for other films would be in inverse proportion to the ASA exposure index numbers of the two films.

CARE OF TYPE 213 LIGHT METER

The Type 213 Light Meter should be protected from severe impact and excessive temperature or humidity. Contact the nearest Large Lamp Department Sales District office to arrange for repair or recalibration.

MEASURING CANDLEPOWER

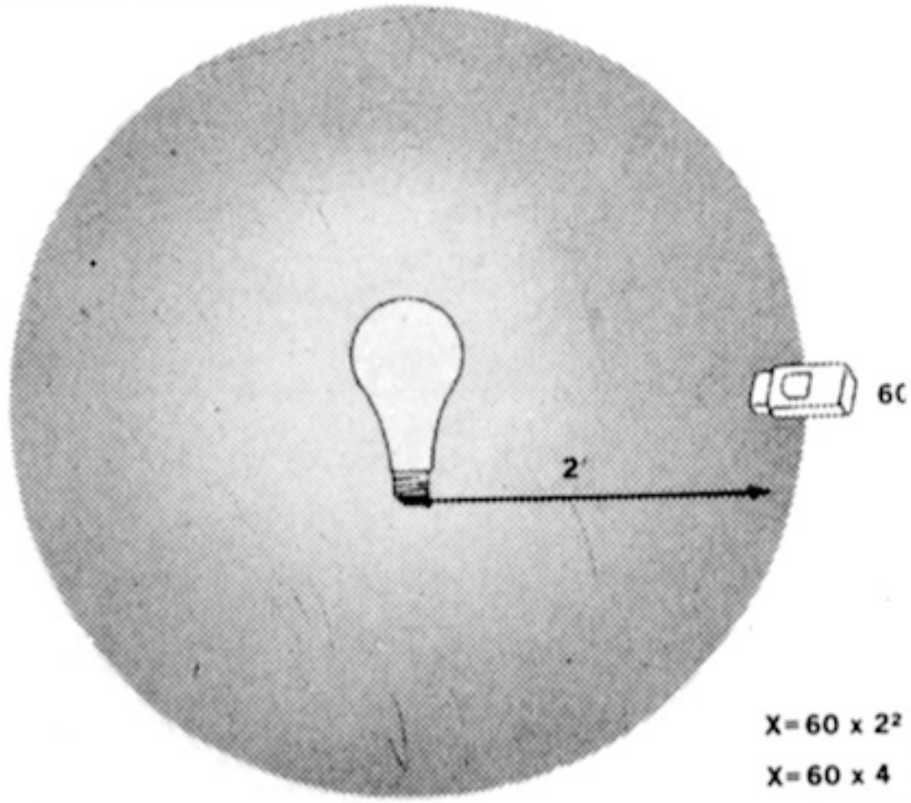
A footcandle can be considered as the density of light on the inside of an imaginary sphere of one-foot radius surrounding a source of one-candle intensity. If the radius of the sphere is increased to two feet, the area of the inside of the sphere mathematically increases by four times, and the density of light decreases to a fourth. Therefore,

1. $Fc = \frac{\text{Candlepower of Source}}{\text{Distance from Source (ft)}^2}$

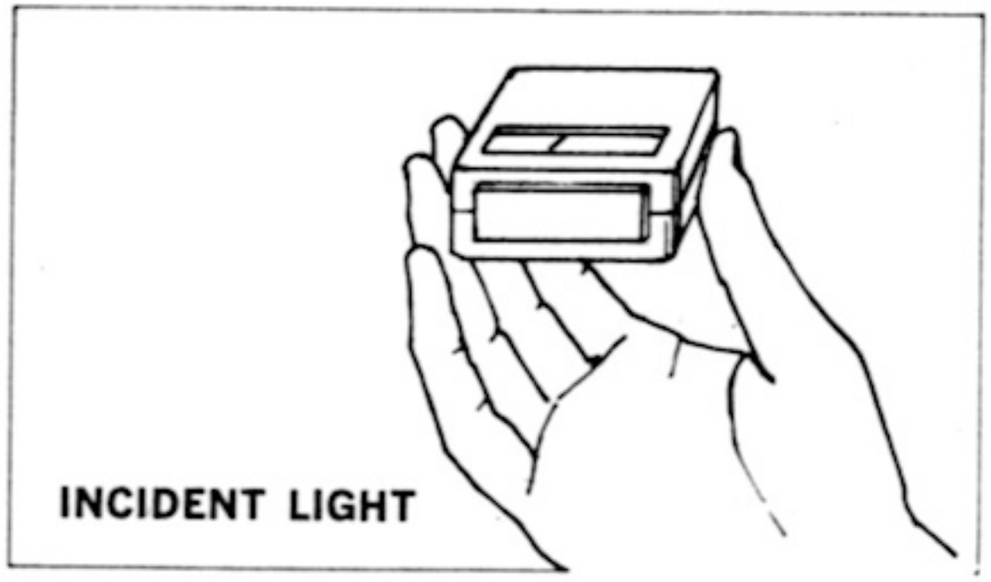
or

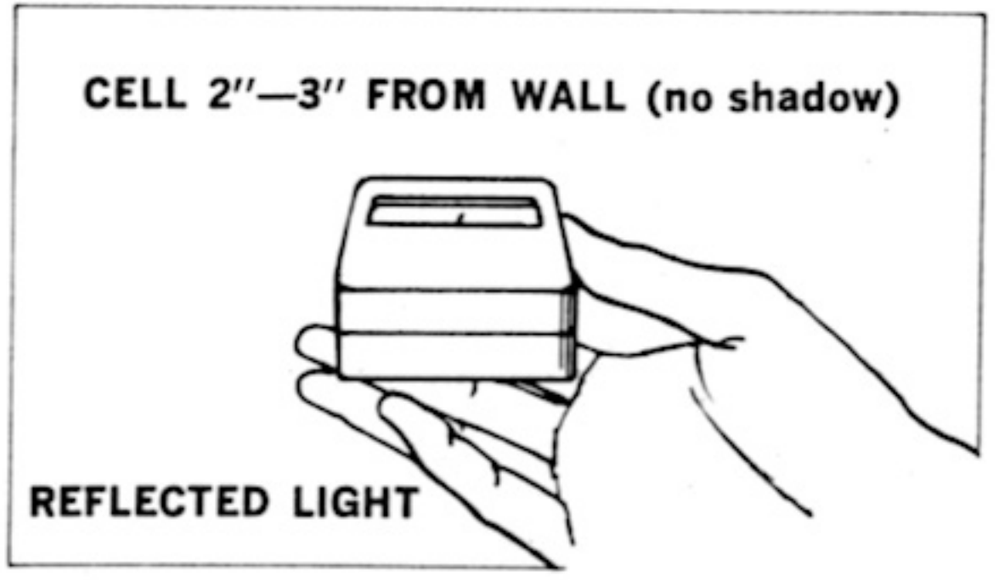
2. Candlepower of Source (cp) = Footcandle (fc) x Distance from Source (ft)^2

The second equation permits the use of the light meter to determine the candlepower of an unknown source.



MEASURING REFLECTANCE

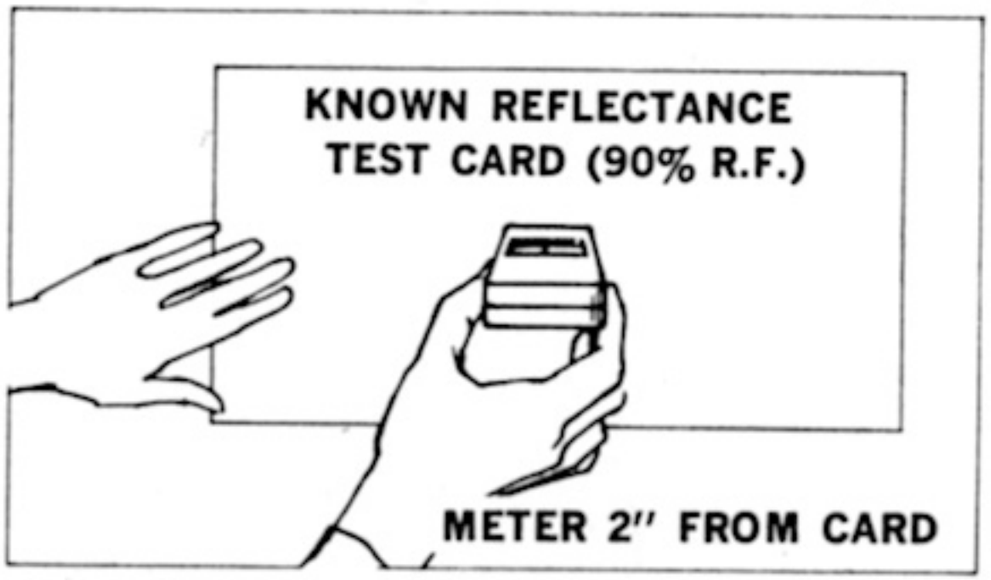


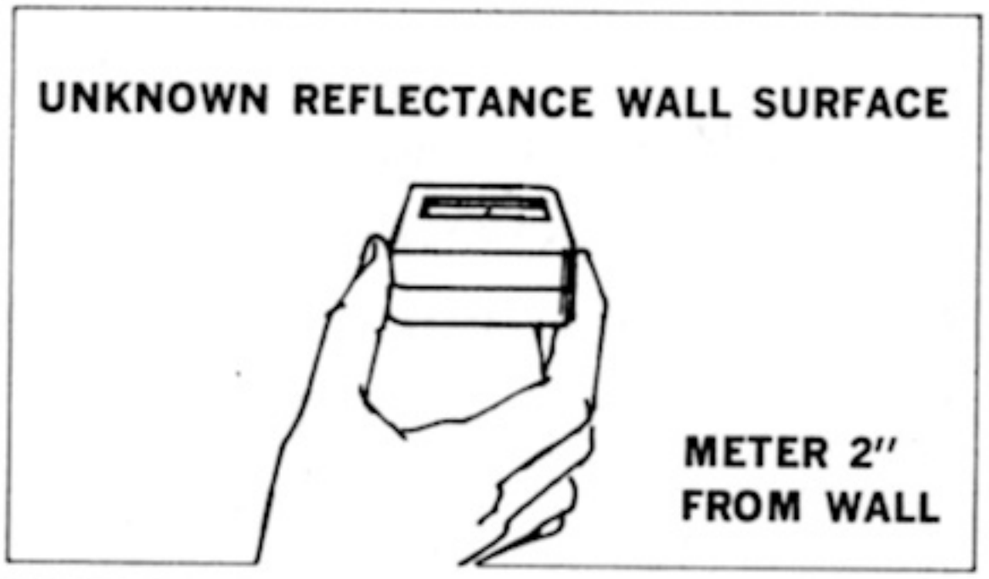


METER READING WITH BASE AGAINST WALL = 65 METER READING WITH CELL FACING WALL = 40

EXAMPLE REFLECTANCE OF WALL: $= \frac{40}{65} = 60\%$ (APPROX.)

REFLECTED/INCIDENT LIGHT METHOD





METER READING WITH 90% REFLECTANCE CARD = 50 METER READING WITH TEST CARD REMOVED = 33

EXAMPLE REFLECTANCE OF UNKNOWN SURFACE: $\frac{33}{50} \times 90 = 60\%$ (APPROX.)

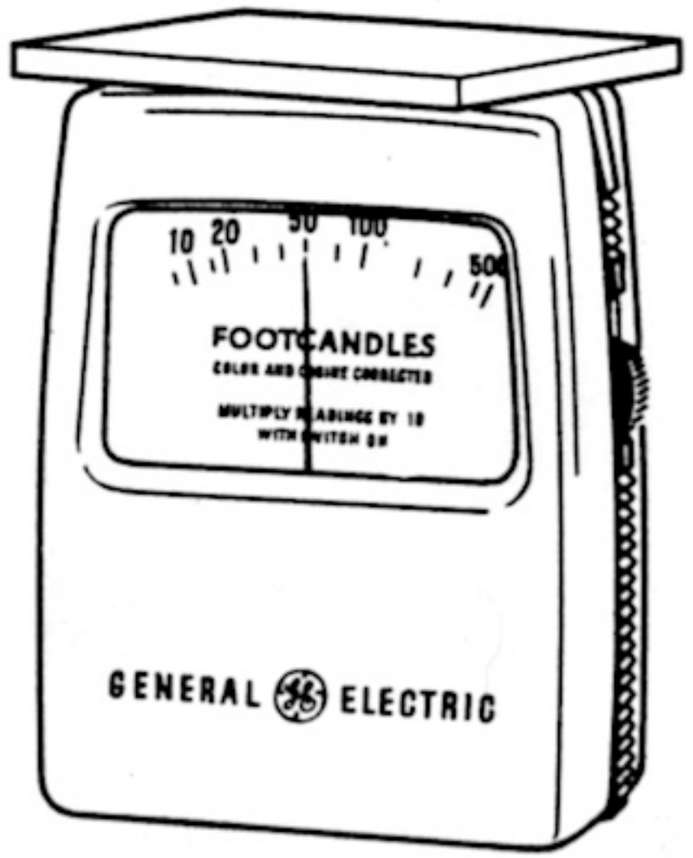
MEASURING TRANSMITTANCE

The light meter can measure the percentage of light transmitted by transparent and translucent materials.

1. Place the sample over the light cell and note the meter reading.
2. Remove the sample, and again note the meter reading.
3. Divide the first reading by the second reading. The value is the transmittance of the material.

EXAMPLE:

With the sample placed on top of the light cell (see drawing). the meter reads 50.



Without the glass sample, the meter reads 100.

50 divided by 100 = .50 or 50% transmittance