Light Intensity Meter

by
JAMES L. McCOY
Westinghouse Lamp Co.

EVER since the beginning of photography, the judging of light value has been one of the great problems, to the photographer of cameraman. In many cases in the past as now, the person responsible for taking of pictures is required to judge light values using his naked eye as an indicating means. His accuracy or ability to do this is the product of his appreciation and his experience as received through this natural indicator.

The unassisted eye at its best is considered unstable with a possible error of 100% or more from day to day when used as a light intensity measuring instrument. It is unreasonable to expect that two or more men would come very close in a simultaneous check.

In order to assist the eye in measuring light and to obtain consistent results, several types of photometers have been developed. In most cases, these instruments are rather awkward to use because they require a comparative slow process of matching of light intensities, to obtain a reading. Therefore, they might be classed as laboratory equipment, from a studio standpoint rather than practical and portable direct reading indicators.

As a natural result, there has been a need for a studio type of photometer that could be worked, set up and read quickly without making adjustments. For this reason, the Westinghouse Lamp Company and the Westinghouse Elec. & Mfg. Company have designed this new tool, to place in the hands of the photographer or camera man to assist him in his work.

This new indicating electrical eye should have the same value to the camera man as the slide rule to the engineer. It is a quick reading light yard stick as simple as a volt meter to read. As this is a very new development, we are not sure just what the possibilities or limitations of this device might be, but it is felt that it has a wide application in the motion picture and other photographic industries.

This meter is self contained and carried as a complete unit in one case. The light sensitive pick-up is a photo electric cell covered with a shield. A window is cut in one side to admit the light to be measured. The photo electric cell unit is connected to the meter by a six foot double conductor cord making it possible to move the cell unit around within that radius without moving the case. The instrument contains a commercial portable micro ammeter calibrated directly in foot candles. The smallest size "B" batteries are wired and mounted into the case. As very little energy is required, the battery life will be about its shelf life.

The cell used in our light intensity meter is a special cell having a very broad response, covering the visible spectrum. This response is such that it will fit in very well for light measurements where the combination of Mazda light and panchromatic film is used. A spectroscopic study of the response of the panchromatic film when plotted against the light of the Mazda lamp shows that the results are somewhat near a straight line making it possible for the meter to give an integration that will come close to the photographic results obtained with given light values

The use of this meter is suggested to be of considerable value when colored pictures are taken because of the integration of the values of different wave lengths of light thru the visible spectrum.

The same cell can also be used for the measurement of north sky daylight giving approximately the same values for the same intensity from a photographic standpoint. The photo cell as used is directional in its pickup making it possible to study the light from different angles. The pickup can be made non-directional if so desired.

The sensitivity is such that a range of full scale readings can be made from 100 foot candles to 3000 foot candles. We believe the range of 400 to 500 foot candles, as read on a full scale of 1000 foot candles will fit the studio requirements the best, but this is a matter to be controlled by the professional studio man.

In order to provide a simple and effective means of calibrating the meter, without returning it to the factory, we plan to mount a low voltage lamp in the meter case to check the cell for calibration. At a definite spacing a calibration check can be easily made. The lamp will be a six volt type to be supplied with energy from a six volt external battery.

Mr. M. W. Palmer of the Paramount-Famous-Lasky Corp., has been doing some work with this photometer during the past few months, to determine the light values on motion picture sets. He has informed me that while he was checking the light reflected from an actor's face, the light intensity meter picked up the change in illumination caused by this man lighting a cigarette. This incident may illustrate how sensitive this device is to change in light intensity.

Method of Testing for Presence of Sodium Thiosulfate in Motion Picture Films

J. I. CRABTREE
Kodak Research Laboratories

A method of testing for the presence of sodium thiosulfate in motion picture film has been worked out which consists of placing strips of processed films in a mercuric chloride potassium bromide solution. If the film contains an appreciable quantity of sodium thiosulfate the solution becomes opalescent, the turbidity being roughly proportional to the quantity of hypo present. It is possible to detect the presence of 0.05 milligrams of sodium thiosulfate (crystals) in motion picture film by this test.

Some of the factors which determine the rate of fading of silver images have been outlined and the critical hypo content and degree of washing necessary with negative and positive motion picture film to insure stability have been indicated.

Under ideal conditions it is necessary to wash thoroughly fixed motion picture negative film for 30 minutes and motion picture positive film for 20 minutes in order to eliminate the hypo. Under practical conditions the times are greater according as the conditions differ from the ideal.

Artistic Considerations In Sound Film Productions

"The time has come when artistic consideration as well as technical knowledge must be used in the production of sound pictures if they are to maintain their place as an entertainment feature of our civilization," stated Joe W. Coffman, president of Audio-Cinema, in a short but to the point address.

"The technician is far too apt to center his whole energy on the solution of his scientific problem and wholly neglect the factor that it is the effects of his results on the audience that will have a great deal to do with the success or failure of the work in hand.

"A monotonous voice repeating, 'I eat pea soup at six fifteen,' may be an example of perfect recording to a sound engineer but it is doubtful if it would have any great box-office attraction.

"The time has come for real directors to assimilate the knowledge brought into the studios by sound engineers and put it to use.

"The director of the future will be a man who thoroughly understands the work and language of the technician but does not let him dominate the production of a picture. He will listen to the technician's advice but must decide himself how much of it to use and how to use it.

"The man at the mixing panel may be far too eager to twist his dial to overcome some sudden change in volume, but this change that he tries so hard to counteract may, if produced unaltered, be the touch of realism that would raise the scene from the level of the commonplace and make it an outstanding feature in the picture.

"The art of editing sound in the dubbing room will take its place beside the editing of pictures in the cutting room. The apparatus for dubbing will probably be greatly improved, but even the apparatus we have today, if properly used, would produce pictures far superior in uniform volume level and sound editing.

"Pictures could be made so there would be no necessity for the operators in the theatre booths to make fader changes during the showing of a reel, and probably will be when the exhibitors begin to demand them."

The Measurement of Film Perforation

W. H. Carson of the Agfa Ansco Corporation after presenting the data on extensive tests to ascertain the cause and amount of shrinkage in motion picture film caused by age and the various processes it necessarily goes through demonstrated and presented to the members in attendance new gauge, or rule, for measuring the actual shrinkage in any piece of film.

The rule works very similar to a micrometer and measures the pitch of the perforations in mm. These rules have never been put on the market in the United States by Mr. Carson stated he would be glad to supply them to anyone who need them.

The pitch of perforation when the film is just perforated is exactly 4.75mm. but becomes somewhat less through shrinkage before the film is put to actual use. The shrinkage should never exceed 1.5% Camera sprockets are made to work with film ranging from 4.77 to 4.68. The best correspondence between film and mechanism is given by film of pitch of 4.71mm.