

Mrs Doris Vila

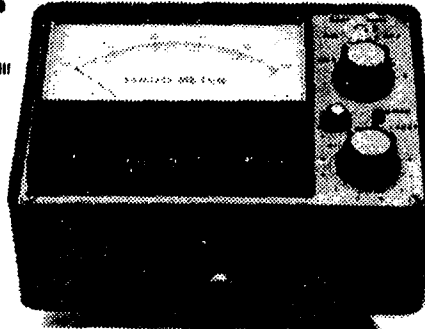
10/14/86

Prices For 1986 Models of Science & Mechanics Supersensitive Photo Meters with Accessories.

This versatile unit has to be the most cost efficient unit on the market. Legend says that Mr. Brown builds these in his basement in Brooklyn, and I believe it, as I have never seen any two of these things exactly the same. (viz. the difference between the Scheide's and the ones in the pictures.) A portion of the instruction manual is reprinted, but the majority of the booklet is not, as it details how to use the unit photographically, which basically involves making a good exposure on photo film or paper, recording the intensities measured with the Model A-3, and using that as a standard. That is why there are no calibrated units on the dial, like microWatts or Lumens. We have devised our own chart which is fairly reliable.

S&M Model A-3 Supersensitive Darkroom Exposure Meter

The One Meter That Does It All!



Battery-Operated

Built-in Scale Lights



4 1/4" Dia. Exposure Calculator

Uses Plug-in Probes

3 ft. Mini Probe 3/8" O.D. x 2"

Light Meter & ground-glass
3 ft. Standard Probe 1/2" O.D. x 2"

The New Improved S&M Model 102 Super-Sensitive Photo Meter!



Uses Plug-in Probes

Standard Probe



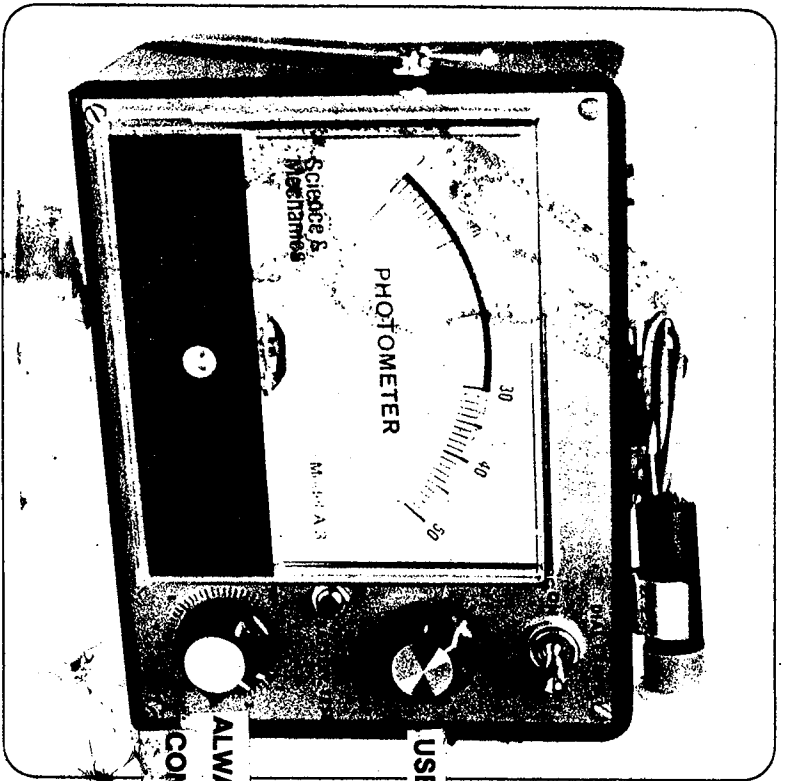
2 7/8" Dia. Exposure Calculator

1. S&M Model 102 Supersensitive Photo Meter with Standard probe, exposure calculator, carrying case and manual \$119.95 Add \$4. for mailing.
2. S&M Model A-3 Supersensitive Darkroom Exposure Meter with one probe, and manual: \$159.95. Extra probes at \$19.95 each. Add \$5 for mailing.
3. Microscope Adapter for standard probe \$12.50.
4. Extra 2 7/8" dia. exposure calculator \$5.50
5. Extra 4 1/4" dia. exposure calculator \$7.50
6. All probes are interchangeable.

Send check, money order or Purchase Order to:
 Science & Mechanics Instruments
 Attn: Wilfred M. Brown
 605 East 59th Street
 Brooklyn, NY 11234
 Tel. # 718-551-3381

Many Thanks for this purchase.
Best wishes,

Wilfred M. Brown



USE APPROPRIATE RANGE

ALWAYS KEEP SENSITIVITY CONTROL TURNED OFF!

MANUAL FOR
SCIENCE & MECHANICS'
SUPERSENSITIVE
PHOTO METER-DARKROOM
MODEL A-3
 BY WILFRED M. BROWN

INTRODUCTION Your Science & Mechanics Model A-3 Super-sensitive Photo Meter was named the "Darkroom Meter" because it is widely used for reading easel exposures for enlarging. But it is just as useful for studio photography, copy work and portraiture.

It is used for still, miniature, and movie cameras. The A-3 Photo Meter is also used by ground-glass exposure readings with microscopes and telescopes and can even be set up for use as a practical densitometer. One of the many new applications for this instrument in scientific photography is exposure determination for holography.

This most versatile Photo Meter gives experimenters, amateur and professional photographers and scientists, the answers to numerous light-measuring problems. The Model A-3 Photo Meter is usually supplied with a 3-foot-long, Standard probe, exposure calculator and attractive carrying case.

Accessories for Your Model A-3 Photo Meter Your S & M Model A-3 Photo Meter is designed to use plug-in probes. Probes of various lengths, as may be required for certain research work, can be supplied upon request at additional cost.

An Easel probe, a Mini-probe and a Densitometer probe, each 3 feet in length, are available as accessories at \$1.95 each. A microscope adapter for use with the Standard probe is available for \$5.00.

Zeroing Your A-3 Photo Meter On receipt of your meter, you should inspect it thoroughly and note if the needle points to zero. If the needle points to the left or right of zero, you can zero it quite easily. To do so, place your meter on a level table and make certain that the Range switch and Paper Speed or Sensitivity control are in "off" positions. Use a small screwdriver, very gently, to adjust the screw at the bottom edge of the meter's face, and bring the needle exactly to the zero mark.

TESTING YOUR A-3 PHOTO METER

Battery Test Information The red-and-green arc on the scale of your meter is for battery test purpose only. When the pointer of the meter falls in the green section, the Mallory RM 630, 1.4 volt mercury cells that power the unit are good. When the pointer falls in the red section, the mercury cells must be replaced. For best accuracy, always replace weak mercury cells with the same kind of Mallory mercury cells, that are used in your meter.

Making a Battery Test To make a battery test, press lightly on the push-button switch and hold for a few seconds while you observe the test reading. Your meter should register approximately 40. Make a note of this initial reading for future reference. This is the reading you should obtain from new and good RM 630 mercury cells used as the power supply in this instrument. This reading indicates that your meter should function very well.

You can make a battery test with the probe plugged in or without the probe. In either case, the same test reading should be obtained. We recommend that you make a battery test whenever you are going to use your meter.

Handwritten notes:
 Red
 Green
 40
 40

Testing Its Functioning Your meter is easy to use once you become familiar with it. Make certain that the Range switch and the Sensitivity control are in "off" positions. Now plug in the Standard probe and move the clear plastic cap that protects the photocell. The plastic cap should never be used when taking reflected-light readings.

Point the photocell of the probe toward a lighted 75-watt lamp and put the Range switch on Range one. With the probe about a foot away from the bare bulb, you should get approximately a half-scale reading. Move the probe closer to the lamp and the needle should swing higher up scale, indicating that the photocell is picking up more light. Move away from the lamp and the needle immediately swings down scale, indicating that the photocell is picking up less light.

Place the probe so that you can get a reading of about 5 on Range 1 and then switch to Range 2. The needle should swing up scale to about 50 or full scale. Try out a few readings on Ranges 1 and 2 and make a note of them for later reference. Carefully check out Ranges 3 and 4 to observe the increase in sensitivity. The meter is so sensitive that on Range 4 it will even read the light that penetrates your thumb! Try it and verify for yourself. In a darkened room, on Range 4 you should get a quarter to half-scale reading at about 10 feet away from a common household candle or match.

Now check your Sensitivity control. When it is clicked into the "off" position, it has no effect on the meter. Turn on the control and rotate it clockwise to a setting between 0 and 1 on its dial. Observe the meter readings with this setting on Ranges 1 and 2. Compare them against readings taken previously on the same Ranges when this control was in the "off" position. The Sensitivity control should affect the meter readings on all Ranges, enabling you to cause the needle to rest at any desired point on the scale.

On Ranges 3 and 4 you will have to continue to turn the Sensitivity control in the clockwise direction to keep the needle on scale. When the meter is used in the darkroom, the Sensitivity control should be turned on before the Range switch to prevent the needle from "banging" off scale. On turning this control "all the way" in the clockwise direction, the needle should dip to zero. Now first turn the Range switch off, and then the Sensitivity control.

Finally, put on the toggle switch and check out the two dial lamps inside the meter. Make certain that this switch is always in the "off" position when your meter is not in darkroom use. Now put aside your meter until you are ready to use it for your work. The information supplied above is to get you acquainted with your Model A-3 meter. It is not presented for you to evaluate the accuracy of the instrument at this time. Rather, it is to show that the meter functions properly when you receive it. You will be able to determine the accuracy of your meter when you put it to the test in real photographic work.

DON'T FORGET TO TURN IT OFF!

USING YOUR A-3 PHOTO METER

AS A LIGHT METER When using the A-3 meter as a Light Meter you should first make certain that the Paper Speed or Sensitivity control is in the "off" position. This control should never be used when using the instrument as a Light Meter. The Standard probe should be utilized for this application. This probe is designed to give you accurate readings when pointed at the area of interest or at a spot of average illumination in an outdoor scene.

Plug in the Standard probe with the plastic cap removed, and then set the Range switch to an appropriate Range depending on the amount of available light. Use the unit just like you would any commercial reflected-light meter.

TO USE HOLOGRAPHICALLY Whenever measuring light in the set up, orient the probe where the film is, usually behind a piece of glass in the filmholder. Place the probe up against the glass. You may notice that pointing the probe directly at the reference beam produces a higher reading, but this is an erroneous one, because the film is not oriented directly toward the reference beam. The probe should be oriented exactly like the film to feel the effects of the power of the light just like the film. It is like the difference between a feeling a punch connecting dead on or being dealt a glancing blow.

MEASURING THE BEAM BALANCE RATIO Start with either beam, and alternate between the two until you find the ratio you are looking for. Move the probe around behind the glass, being exposed to each of the beams to find an average reading. In the case of focussed image holograms, base the ratio on the brightest spot of the image at the film plane.

BEAM BALANCE RATIO SUGGESTIONS TYPE OF HOLOGRAM RATIO (Reference:Object)

Laser Transmission	4:1
White Light Transmission ¹	4:1
One Step Rainbow Shadowgram	4:1
Two Beam Reflection	2:1
Diffraction Grating	1:1
Single Beam Reflection	Determined by object

TO DETERMINE THE EXPOSURE, measure both beams simultaneously. Then check the chart.

ADDENDUM TO MODEL A-3 INSTRUCTIONS

EXPOSURE CHART FOR REFLECTION OR TRANSMISSION ON PLATES			
PROCESSING: DEVELOPER CWC2 FOR 2 MINUTES + COPPER S. BLEACH			
SCALE NUMBER ON SCIENCE & MECHANICS PHOTO METER →	2	3	4
D I A L	24 sec	240 sec	2400 sec
S E T	12 sec	120 sec	1200 sec
T I N G	6 sec	60 sec	600 sec
	4 sec	40 sec	400 sec
	2 sec	24 sec	240 sec
	1 1/2 sec	12 sec	120 sec

EXPOSURE CHART FOR REFLECTION OR TRANSMISSION ON FILM			
PROCESSING: DEVELOPER CWC2 FOR 2 MINUTES + COPPER S. BLEACH			
SCALE NUMBER ON SCIENCE & MECHANICS PHOTO METER →	2	3	4
D I A L	12 sec	120 sec	1200 sec
S E T	8 sec	80 sec	800 sec
T I N G	4 sec	40 sec	400 sec
	2 sec	20 sec	200 sec
	1 1/2 sec	12 sec	120 sec
	1 sec	8 sec	80 sec

The Exposure Chart was compiled by students many years ago. Recent testing has shown that if there is a reading of 15 on the 3 Scale, exposure time would be 30". And other tests showed that a 30 on the 3 Scale meant 15" exposure. Which makes perfect sense, since 30 on the 3 Scale is twice as much light as 15, so the exposure time would have to be one-half the time. And 45" was the best exposure when a 10 on the 3 Scale was read.

Notice that 15 x 30 and 30 x 15 and 10 x 45 all = 450. This number is our Holographic Film Speed Number, not unlike the ASA/ISO numbers for photography.

Except that this number is simpler to use. Simply measure the incident laser flux at the Holographic Film Plane with the Meter, divide the number on the 3 Scale into 450. The quotient will be the exposure time in seconds for Agfa Holotest 8E75HD Film, developed for 2 minutes at 75F in CWC2 Developer and bleached in the Copper Sulfate Bleach.

Holographic Plates are traditionally half as sensitive as the film product. Multiply the time found using the method above by two, or use 900 as the Plate Speed Number.

Since each scale on the Model A-3 differs from each other by a factor of 10, the Film Speed Number on the 1 Scale is 4.5, on the 2 Scale it is 45, and on the 4 Scale it is 4500.

If you examine the old chart, you will see that their Meter Reading versus Exposure Time product is essentially what we have arrived at. Kudos to all who had participated in the experiment.