

# DARKROOM AUTOMATION

1412 Dorsh Road  
Cleveland, Ohio 44121-3840  
<http://www.darkroomautomation.com>

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## *f*-STOP TIMER INSTRUCTION MANUAL



### INSTALLATION

Power: 90 - 130 VAC, 60Hz nominal.

Enlarger: 300 watts maximum incandescent or cold light. If more wattage is needed then the enlarger should be wired through a contactor with the timer controlling the contactor coil.

Safelight: 50 watts incandescent maximum. Do not use sodium vapor or fluorescent safelights - they are not designed for rapid on-off cycling.

Footswitch: Optional: momentary logic-level contact, 1/8" miniature phone plug. Do not use a footswitch designed for controlling AC power.

# DISPLAY AND CONTROLS

Note: The manual shows nominal timer settings. In use the display would show the exposures set by the operator.

## Display

- The last two digits in the LED display show the exposure setting directly in stops. Stops are related to time as follows:

<u>Display</u> in stops	<u>Exposure</u> time in seconds
0.0	1.0
1.0	2.0
2.0	4.0
3.0	8.0
3.1	8.6
3.2	9.2
...	...
9.8	891.4
9.9	955.4

- The first digit in the display shows the timer's mode:

2.0 Base exposure of 2 stops - note there is no first letter  
t0.5 Test strips in 0.5 stop increments  
b1.0 Burn in 1 stop  
d0.5 Dodge 0.5 stops  
p1.5 Progressive burn-within-a-burn of 1.5 stop

- There are three alpha prompts:

Foc Focusing  
Fin Finish a dodging exposure  
re.y Reset-Yes start a new sequence of progressive burns  
re.n Reset-No continue present set of progressive burns

- When an exposure is being made the display counts down the remaining time in seconds.
- When the timer is paused the display blinks and shows the remaining time.

## Expose Key - Starburst

The expose key starts, pauses and cancels exposures and places the timer in focusing mode.

- Expose

Hitting the expose key starts an exposure.

- Pause

Hitting the expose key when exposing pauses the exposure. Hitting the key again resumes the exposure

- Cancel

Holding the expose key down when the timer is exposing or paused cancels the exposure.

- Focus

Holding the expose key down when the timer is idle places the timer in focus mode. The enlarger turns on and the display shows 'Foc'. Hitting the expose key again turns the enlarger off. The enlarger can be focused in base, dodge, burn, progressive burn and test-strip modes.

## Mode Key - Circular Arrow

The mode key cycles the timer through the base exposure, dodge, burn and test strip modes.

## Raise and Lower keys - Up and Down Arrows

- The raise and lower keys adjust the displayed exposure setting in 0.1 stop increments. Holding the key down will ramp the exposure setting.
- When resetting a progressive sequence the keys are used to select re.y and re.n - this operation is explained in the section on burning.

## Footswitch - Optional

The footswitch duplicates the function of the expose key and is especially convenient for dodging and burning where it can be used to turn the enlarger on in focus mode [with a red filter over the enlarger lens] for positioning dodgers and burning cards. The red filter is then flipped out of the way and the exposure is started with a tap on the footswitch.

## BASIC OPERATION

Turn the timer on with the power switch. The display will show **2.0** stops. The burn, test strip, and dodge times will be reset to their nominal values.

The safelight will turn on and the enlarger will be off. The safelight is always on if the enlarger is off and vice-versa.

1. Focus by holding the expose key down until the enlarger turns on and the safelight turns off. The display will show **Foc**. Tap the expose key to turn the enlarger off.
2. Set the exposure with the up and down keys. Holding the key down ramps the setting.

Though normally not needed, a table of displayed stops and times is provided in the appendix.

3. Press the expose key to start the exposure: the enlarger turns on, the safelight turns off and the display counts down the remaining seconds.

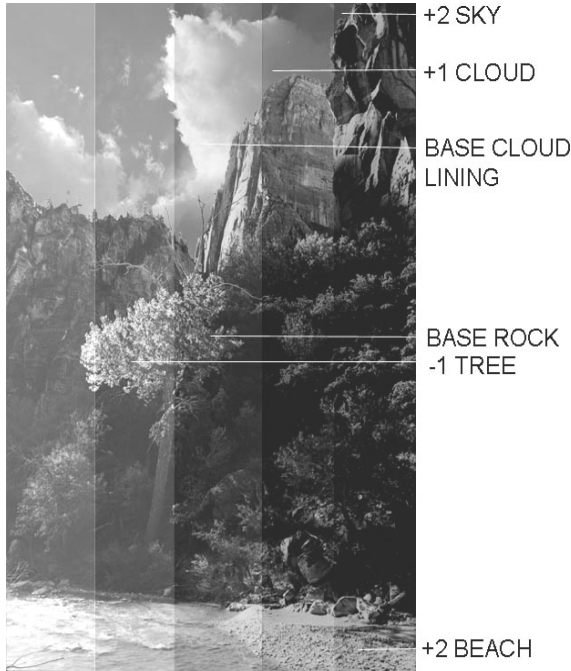
## TEST STRIPS

The timer can make test prints with any base and strip exposure.

The steps in making a test strip exposure are:

1. Make a base exposure of the entire sheet as described above. This exposure should be below the expected exposure for the print so that one of the test strips will show the proper exposure and exposures above and below the base exposure.

2. Press the MODE key until the display shows test strip mode, **t0.5** as an example, and set the desired step size with the up and down keys.
3. Cover a strip of the paper with a card and press the EXPOSE key.
4. Advance the card across the paper and press the EXPOSE key for the next exposure. Repeat across the sheet of paper.



The result should look like the example test print to the left.

The print was made at a base exposure of **1.0** and a test strip interval of **t1.0**. The middle strip, at **3.0** stops, is correctly exposed and chosen for the base exposure.

It also shows dodging and burning adjustments to the base exposure. Note the adjustments are in stops +/- from the central base exposure – all the dodge and burn adjustments stay the same when the base exposure changes.

With each advance of the card across the paper the timer exposes for the additional amount of time needed to expose the next strip and remainder of the sheet. This might seem confusing at first. As an example:

Base exposure = **2.0**; Test strip interval = **t0.5**

<u>Strip</u>	<u>Stops</u>	<u>Timer Exposure</u>	<u>Total time</u>
Base / strip 1	2.0	4.0 seconds	4.0 seconds
Strip 2	2.5	1.7	5.7
Strip 3	3.0	2.3	8.0
Strip 4	3.5	3.3	11.3
Strip 5	4.0	4.7	16.0

# MAKING A PRINT, AN EXAMPLE

Using the test print above as an example the sequence of exposures is:

1. Base exposure and dodging:
  - a. Set the base exposure to **3.0**;
  - b. Press the mode key to the dodge display and set to **d1.0** stops;
  - c. Press the expose key and make the undodged exposure;
  - d. Press the mode key to **Fin** to finish the exposure with the dodger
  - e. Insert the dodger over the tree foliage;
  - f. Press the expose key.
  
2. Burn in the beach:
  - a. Press the mode key to the burn display and set to **b2.0** stops;
  - b. Insert a card to cover all but the beach;
  - c. Press the expose key to make the burn exposure.
  
3. Burn in the sky and clouds:
  - a. Set the timer to **b1.0** for the sky & cloud burn;
  - b. Cover all but the sky and clouds;
  - c. Press the exposure key to make the burn exposure.
  
4. Burn in the sky for one more stop:
  - a. Press the mode key and use the up down keys to set the timer to a progressive burn of **p1.0** stops;
  - b. Cover the foreground and clouds;
  - c. Press the exposure key to make the additional 1 stop burn for the sky.

The following sections discuss dodging and burning in more detail.

## DODGING

The timer automates the timing of one or more dodges.

If only one dodge is needed then the steps are as shown in the example above.

Multiple dodges are made in sequence, the longest dodge first. As an example, a print is made with a base exposure of 4.1 stops and dodges of 2 and 1.5 stops:

1. Set the timer to **4.1**
2. Press the mode key to advance to the dodge display and set **d2.0**
3. Press the expose key to make the undodged portion of the exposure
4. Adjust the timer to **d1.5**
5. Insert the dodger for the 2 stop dodge
6. Press the expose key to make an exposure of the difference between a dodge of 2 stops and a dodge of 1.5 stops
7. Press the mode key to advance to **Fin**
8. Insert the dodgers for the 1.5 stop dodge and the 2.0 stop dodge
9. Press the expose key to make the final dodge exposure, thus completing the base exposure

The dodge exposure has to be less than the base exposure and less than the previous dodge.

Dodge exposures are automatically compensated for when a change is made in the base exposure: the timer's dodge settings in stops remain the same.

## BASIC BURNING

Burning is performed after a base exposure has been made.

Press the Mode key so the display shows **b1.0** and set the desired burn time.

The burn setting adds to the base exposure so that the total exposure to the burned-in region is the base exposure plus the burn exposure. As an example if the base exposure is 3.0 time stops (8 seconds) and the burn setting is 1.5 stops then the total exposure to the burned area is 4.5 time stops (22.6 seconds) and the timer will expose for the additional 14.6 seconds when the burn exposure is made.

Burn settings are automatically compensated for changes in the base exposure, such as those due to changes in print size or paper speed. If, in the above example, if the base exposure is changed to 4.8 time stops (27.9 seconds) the timer will expose the burned area for the time required to bring the burned-in area to 6.3 stops (4.8 stops + 1.5 stops

= 6.3 stops = 78.8 seconds) and the additional exposure would be for 50.9 seconds (78.8 seconds - 27.9 seconds).

## PROGRESSIVE BURNING

Progressive burning is used to make a burn inside of a previously burned in section: as in the example the sky gets a basic burn and the clouds get an additional burn.

The progressive burning display, **p1.0**, is brought up by pressing the mode switch after the basic burn exposure has been made. Set the desired additional number of stops and press the expose button.

Progressive burns can be made inside the previous progressive burn: burn in the sky, a progressive burn for the cloud and an additional progressive burn for the dark underbelly of the cloud.

The progressive sequence is reset by pressing the Mode key so the display shows **rE.n** and pressing the Up key to change the display to **rE.Y** for "Reset - Yes" and pressing the mode key. The next progressive burn will be made on top of the basic burn.

If no more progressive burns are desired then the Mode key is pressed to make a new basic burn or to make a new print.

## DRYDOWN

Compensate for drydown by decreasing the base exposure by 0.1 stop for 7% drydown and 0.2 stops for 14% drydown. The dodge and burn exposures will automatically track the adjustment to the base exposure.

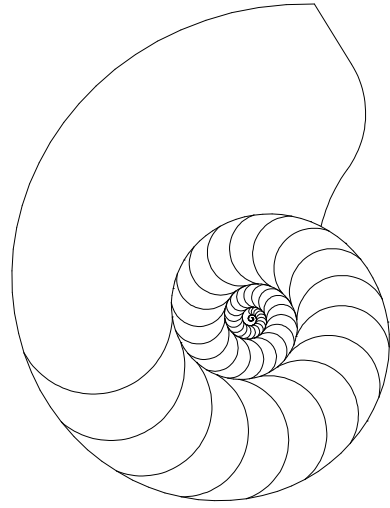
Drydown compensation varies with the paper, toning, ferrotyping, drying temperature, drymounting, covering glass and lighting. Tests should be run to determine the degree of drydown compensation required, if any.



# APPENDIX

## Table of stops and times

<u>Stops</u>	<u>Secs</u>	<u>Stops</u>	<u>Secs</u>	<u>Stops</u>	<u>Secs</u>	<u>Stops</u>	<u>Secs</u>
0.0	1.0	2.5	5.7	5.0	32.0	7.5	181.0
0.1	1.1	2.6	6.1	5.1	34.3	7.6	194.0
0.2	1.1	2.7	6.5	5.2	36.8	7.7	207.9
0.3	1.2	2.8	7.0	5.3	39.4	7.8	222.9
0.4	1.3	2.9	7.5	5.4	42.2	7.9	238.9
0.5	1.4	3.0	8.0	5.5	45.3	8.0	256.0
0.6	1.5	3.1	8.6	5.6	48.5	8.1	274.4
0.7	1.6	3.2	9.2	5.7	52.0	8.2	294.1
0.8	1.7	3.3	9.8	5.8	55.7	8.3	315.2
0.9	1.9	3.4	10.6	5.9	59.7	8.4	337.8
1.0	2.0	3.5	11.3	6.0	64.0	8.5	362.0
1.1	2.1	3.6	12.1	6.1	68.6	8.6	388.0
1.2	2.3	3.7	13.0	6.2	73.5	8.7	415.9
1.3	2.5	3.8	13.9	6.3	78.8	8.8	445.7
1.4	2.6	3.9	14.9	6.4	84.4	8.9	477.7
1.5	2.8	4.0	16.0	6.5	90.5	9.0	512.0
1.6	3.0	4.1	17.1	6.6	97.0	9.1	548.7
1.7	3.2	4.2	18.4	6.7	104.0	9.2	588.1
1.8	3.5	4.3	19.7	6.8	111.4	9.3	630.3
1.9	3.7	4.4	21.1	6.9	119.4	9.4	675.6
2.0	4.0	4.5	22.6	7.0	128.0	9.5	724.1
2.1	4.3	4.6	24.3	7.1	137.2	9.6	776.0
2.2	4.6	4.7	26.0	7.2	147.0	9.7	831.7
2.3	4.9	4.8	27.9	7.3	157.6	9.8	891.4
2.4	5.3	4.9	29.9	7.4	168.9	9.9	955.4



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