



Battery and Power Supply Information

Low battery indication

A low battery is indicated when the keypad LEDs start to dim. When only the ⌚ key remains illuminated, this indicates that the battery requires changing as soon as possible; further use may result in inaccurate meter readings or unexpected behaviour!

Changing the Battery

The ZoneMaster is powered by an internally fitted 9v battery, type PP3 or equivalent (MN1604, 6F22). Alkaline types will give the longest life but rechargeable types can be used if preferred.

To gain access to the battery, firstly ensure the unit is switched off, then remove the four screws on the base of the main console. Place the unit right way up and gently lift the lid section away from the base taking care not to place undue strain on any of the wiring. The battery can now be changed. Carefully remove the old battery from its holder and discard (observing any local regulations regarding disposal). Fit the new battery into the holder, observing correct polarity.

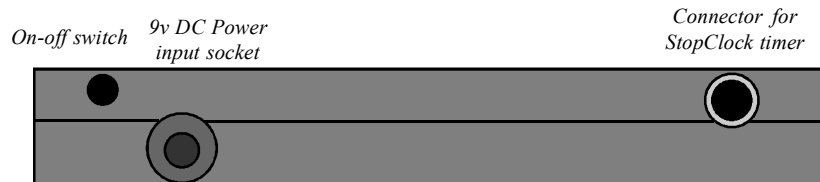
To refit the lid assembly to the base, firstly locate the front of the lid on the base and ensure the sensor connector fits in the hole in the front of the base. Taking care not to trap any wiring, fully mate the two sections and replace the screws.

Using a mains power supply

For optimum performance and reliability we suggest you use only a regulated DC power supply capable of supplying 7.5v or 9v at 100mA.

If you have a suitable power supply it should be set to 7.5v or 9v DC, centre pin positive, and the connector is a 2.1mm type. **INCORRECT VOLTAGE OR POLARITY CAN CAUSE EXTENSIVE DAMAGE TO THE ZONEMASTER WHICH WILL NOT BE COVERED BY THE GUARANTEE.**

The power connector is located on the rear panel of the main console as shown below.



Rear Panel view



ZoneMaster II Enlarging Meter

Operating Instructions



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Issue 10: March 2007.

Firmware version 4.4

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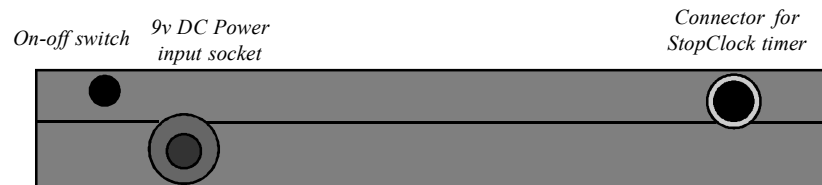
IMPORTANT POWER INFORMATION

The ZoneMaster II is designed to operate from a 9v supply using a 9v PP3 / 6F22 / MN1604 type battery or from a plug-in DC power supply module. Suitable power supplies are usually available from electrical retailers.

Turn to the back cover for full details of power supply options and battery information.

Incorrect voltage or polarity may cause extensive damage to the unit which will not be covered by the guarantee - please take great care when connecting a power supply.

The power supply connector is on the lower rear panel of the main console - refer to the illustration below. Do not change the battery or plug in or unplug a power supply while the ZoneMaster II is switched on. Doing so may damage the sensitive electronics in the unit.



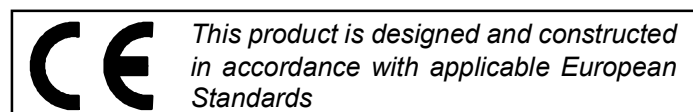
Rear Panel view

Standby Mode

The ZoneMaster II incorporates an optional (see p20) standby mode which it will automatically enter after 30 seconds after the last button was pressed. This saves battery life by turning off the display. To wake up the meter, press any key. While the ZoneMaster II is in standby, the decimal point of the Grade display will flash. The keypad illumination remains lit.

GUARANTEE

This equipment is guaranteed against faulty components or manufacture for a period of two years from the date of original purchase. Should an apparent fault develop within this period, **please telephone us for advice before returning the unit.** If there is a fault, we will repair or replace (at our option) the equipment at no charge. This guarantee does not affect your statutory rights. Damage due to misuse of the equipment, and any consequential loss arising out of the use or misuse of the equipment are not covered by this guarantee.



StopClock Professional

The ultimate enlarger timer!

StopClock Professional Features and Specifications



- Two completely independent timing channels, each of up to ten exposures. Ideal for "split grade" printing on variable contrast paper - one channel can be used for the hard exposures and one for the soft. A special "Split grade" mode couples the channels together so that adjustments to one are reflected in the other, and an equivalent "grade" is displayed.
- Base exposure time 0.5 seconds to 240 seconds. Exposure time is set in coarse intervals of your choice of 1/2, 1/3, 1/4, 1/6, 1/12 stop, and fine intervals of 1/24 stops (approximately 1.6%). A single button press selects between fine or coarse intervals at any time - the coarse interval being your currently selected choice. If all this sounds a bit complicated, just think of it as a simple adjustment of print density in straightforward, consistent steps.
- Nine subsequent exposure times (per channel), each calculated relative to the base exposure or to the total exposure so far. If the base exposure is changed, all the burn-in exposures are recalculated to maintain the correct density relationships on the print. This allows a sequence of exposures to be pre-programmed into the timer allowing multiple copies of a multi-exposure print to be made quickly and simply.
- Alternative "real time" mode offers linear timing, set in 0.1 seconds steps. The programmable memories are not available in this simple mode.
- Pause and resume feature allows any exposure to be interrupted, and then resumed or aborted. Any step in a sequence can be printed individually at will.
- Automatic test strip mode for quickly producing test strips in coarse or fine intervals, any length subject to a maximum time of any one step of 240 seconds. Test strips can be made in an incremental sequence, or a sequence of complete exposures.
- Compensation for print dry-down, toning etc. The compensation factor can be applied at any time with a single button press and is adjustable over a range of +/- 20%
- Large, clear yellow LED display is safe for both colour and black and white materials. Three levels of brightness.
- Audible beep at the end of each exposure; optional seconds tick.
- Automatic safelight switching, manual (focus) mode, optional lamp saver switches off the enlarger after five minutes in "Focus" mode.
- Footswitch included, with 1.4m / 5' lead
- Accuracy and repeatability: better than 0.1% (quartz-controlled)
- Optional switching delay to compensate for slow-start voltage stabilisers (e.g. certain Durst and Kaiser models)
- Switching capacity: 750W (230V) or 500W (115V). Suitable for cold-cathode enlargers. Outlets are industry standard CEE22 (like personal computers etc).
- Size: 200 x 65 x 160 mm, weight 2000g (approximate figures)
- Price includes: two CEE22 plugs (one each for enlarger and safelight), mains lead with fitted



Contents

1. Introduction.....	4
2. Features.....	4
3. Setting Up.....	6
4. The Display.....	7
5. Using the timer.....	8
6. Using the exposure meter - Important points to remember!	9
7. Making your first print.....	10
8. Print too light or too dark.....	12
9. Print too soft or too hard.....	14
10. Exposure Correction.....	15
11. Factors affecting exposure and contrast.	16
12. More advanced Metering.....	17
13. Burning-in.....	18
14. Other useful techniques.....	20
15. User Set-up.....	20
16. Densitometer Mode.....	21
17. Enlarger Considerations.....	21
18. Calibration.....	23
19. Quick Reference for common operations.....	24
Button Quick Reference Chart.....	24
Using the ZoneMaster with the RH Designs StopClock Professional or StopClock LE.....	24

PLEASE NOTE:

Switch off the unit before plugging in or unplugging the sensor cable or the interface cable to the StopClock.



1. Introduction

- 1 Thank you for choosing the ZoneMaster II, the f-stop enlarging meter designed by photographers for photographers. Please read these instructions carefully before installing and using it.
- 2 The ZoneMaster II is designed for black and white printing using variable contrast and fixed-grade papers. The standard built-in calibration suits Ilford Multigrade IV RC paper using a standard enlarger (tungsten/halogen lamp and diffuse illumination) and the Ilford Multigrade Filter Set (under- or above-lens). The instrument can easily be calibrated to suit different materials, equipment and methods, enabling you to produce high quality prints without the need for test strips.
- 3 The ZoneMaster II is an enlarging exposure spot-meter with a unique grey scale display. Each time a measurement is taken, an LED lights up alongside the grey scale to indicate the shade of grey that will appear on the print. You can then adjust the exposure and contrast of the print using the grey scale display, allowing you to preview and adjust the tonal range of the print without making any test strips.
- 4 It is not an “automatic meter”, it does not replace the intelligence or stifle the creativity of the photographer. Indeed, by illustrating the tonal range of the negative and by allowing you to change both exposure and contrast settings, it provides valuable insights into the nature of the negative and full control over the resulting print.
- 5 This latest version of the ZoneMaster II uses a completely new sensor offering greater accuracy, stability and speed than ever, and is supplied with test materials to assist calibration.

2. Features

- 1 The ZoneMaster incorporates a count-down timer which can be used to time exposures in conjunction with a manual enlarger on-off switch. When the Print button is pressed, a countdown starts and an audible signal indicates that the enlarger lamp should be switched on. At the end of the exposure time, a further signal indicates that it should be switched off again. The timer can be used on its own as a general purpose count-down timer.

2.1 F-stop Timing

- 1 Unlike conventional enlarger timers, the ZoneMaster II works in “constant exposure steps”. Each step increases or decreases the exposure by a constant amount so whatever the actual exposure time, each step adjusts the tones on the print by the same amount. You will soon begin to think in terms of simply changing the shades of grey on the print in steps, instead of having to work out how many seconds you need to accomplish the same result. The system works exactly like the exposure adjustments on a camera, and we call it “f-stop printing”, a term originally coined by Gene Nocon in his book “Photographic Printing”.
- 2 The size of the exposure steps is adjustable from fine (1/12 stop) to coarse (1/3 stop). We call this setting the “Step size”. There are two buttons on the ZoneMaster which adjust exposure, called “Darker” and “Lighter”, and a



StopClock.

- 2 To synchronise communications correctly, switch the StopClock on first followed by the ZoneMaster. If for any reason the communication is lost it can normally be restored by pressing the Darker or Lighter button on the ZoneMaster; if that doesn't work switch the ZoneMaster off and then on again. Note that synchronisation will not occur if the StopClock is in Test Strip Mode when the ZoneMaster is switched on. When communications have been established between the ZoneMaster and the StopClock Professional, the “ZM” indicator on the StopClock will illuminate.
- 3 Test the link by pressing the Darker or Lighter button on the ZoneMaster; the time should change on the StopClock to match that shown on the ZoneMaster's display. Note that on the Professional model, there may be a small discrepancy between the times displayed on the two units - this is normal, and due to rounding errors as the StopClock Professional stores times to 0.01 seconds.

Using the ZoneMaster


- 1 When measurements or exposure adjustments are made on the ZoneMaster the displayed time will be echoed on the StopClock so after any measurements, time or grade adjustments the StopClock will be ready to control the enlarger. An added benefit is that the safelight will be extinguished during measurements automatically.
- 2 When the ZoneMaster is connected to a StopClock the Print button on the ZoneMaster is disabled; all printing, test strips or greyscales are made using the Print button on the StopClock.

Using the StopClock


Some of the StopClock's functions and features will change slightly when it is connected to a ZoneMaster:

- 1 Only the F-Stop modes of the StopClock are used.
- 2 The step-size setting on the ZoneMaster will be set also on the StopClock. The stepsize can only be altered from the ZoneMaster; an attempt to adjust the stepsize on the StopClock will be ignored.
- 3 Test Strips will be made in increments corresponding to the ZoneMaster's step size. The StopClock Professional switches to a special 7-exposure test strip sequence to match the ZoneMaster when the units are connected.
- 4 On the StopClock LE, press and hold the Print button while the enlarger is on to set up a fifteen-step test strip, used for making greyscales. On the Professional model when disconnected from the ZoneMaster, test strips can be any length.
- 5 Exposure changes can still be made using the Up and Down buttons on the StopClock and will stay in force until an adjustment is made by the ZoneMaster, as a result of making a measurement or adjusting the paper grade or exposure settings.
- 6 If the power saving feature of the ZoneMaster is enabled (this is the factory setting) it will still switch into low-power mode to conserve battery power (it is not powered from the StopClock when connected to it). Any key press will awaken it, and a subsequent action as in 5 above will synchronise the StopClock if necessary.










- Set your timer to the indicated time and expose the whole of the paper.
- Cover 1/7 of the paper. Press  and set your timer to the new indicated time. Expose the remaining paper.
- Repeat until the sequence ends.

Burning-in

- Determine the base exposure and grade settings in the usual way.
- Expose the whole of the print for the base exposure, and make a note of the exposure time.
- Using  increase the exposure setting until the indicator representing the highlight to be burned in is adjacent to the required tone.
- Mask the areas not requiring the extra exposure. Subtract the base exposure time from the new indicated time and the burn-in exposure.

Button Quick Reference Chart

Button	Symbol	Short Press	Long Press
Print		Start the count-down timer	Display test strip timings
Harder		Increase Grade / Contrast	-
Softer		Decrease Grade / Contrast	-
Darker		Increase Exposure	Auto-repeat
Lighter		Decrease Exposure	Auto-repeat
Clear		Clear Measurements	-
Calibrate		Select Paper Set	Enter Calibrate Mode

Using the ZoneMaster with the RH Designs StopClock Professional or StopClock LE

The ZoneMaster can be connected to a StopClock, in which case exposure time and step-size information will be transmitted to the timer. This saves you from having to set the time on the StopClock manually.

Setting up

- 1 Switch off both units before connecting them together using the supplied lead. Press the jack plugs firmly into the sockets provided on the StopClock front panel and the rear of the ZoneMaster. This connection enables the ZoneMaster to send exposure time and stepsize information to the



single press of either button changes the exposure by one step. The meter also incorporates compensation for paper reciprocity failure, improving accuracy with large prints or dense negatives. You simply set your enlarger timer to the time shown on the ZoneMaster's display.

- 3 When required, test strips can be made quickly and easily using the built-in test strip generator which displays the times of a sequence of 7 exposures, each one step darker than the previous and centred on the currently-set time. The result is a test strip with three lighter and three darker exposures. Test strips are made using the set stepsize so can be in fine, medium or coarse steps. Two types of test strip can be made - individual separate exposures or incremental exposures. The ZoneMaster displays the time settings required for each step, which you can then set on your enlarger timer.
- 4 The ideal companion to the ZoneMaster II is RH Designs' StopClock Professional Enlarger Timer. This can be connected to the ZoneMaster so that the time calculated by the meter is automatically set on the timer.

2.2 The Exposure Meter

- 1 The principle of the meter is simple. When printing, the correct exposure is determined by the highlights. The shadows are then controlled by adjusting the contrast (usually called "grade") of the paper either by changing the enlarger filters (for variable-contrast papers) or choosing a different grade of fixed-grade paper. (If you've heard the expression "expose for the shadows, develop for the highlights" when using black and white film, this is exactly the same principle but of course in reverse.) The ZoneMaster therefore interprets the lowest measured light level as the print highlight, and sets the exposure accordingly. If the grade setting is subsequently changed, the exposure is recalculated to ensure the highlight density remains constant.
- 2 The ZoneMaster uses a spot-metering sensor which measures a small area of the projected image on the enlarger baseboard. You simply position the sensor in the area of interest (a highlight, shadow or important mid-tone) and press the "Measure" button. The ZoneMaster measures the light level and displays the equivalent print tone using the 15 LEDs alongside the grey scale. The exposure setting is calculated from the darkest (most dense) measurement - this corresponds to the brightest highlight on the print, indicated by the LED at the white end of the display. All other measurements (up to 8 in total) are shown using LEDs next to the corresponding tones. The placement of the tones depends on the paper grade setting in use - the higher the grade setting, the more widely spaced the tones will be.
- 3 To make a print, at the simplest level you just need to take two meter readings; one of the brightest highlight and one of the darkest shadow. This lights two LEDs, one next to the white end of the scale, and another further down the scale. If necessary, you can then adjust the paper grade setting on the ZoneMaster to place the darker LED next to the black end of the scale. Then, choose the appropriate filter (as displayed by the ZoneMaster) and set the indicated time on your timer to expose the paper.
- 4 The ZoneMaster's meter can store and display up to 8 measurements, and has a densitometer feature to assist you with refining your film development

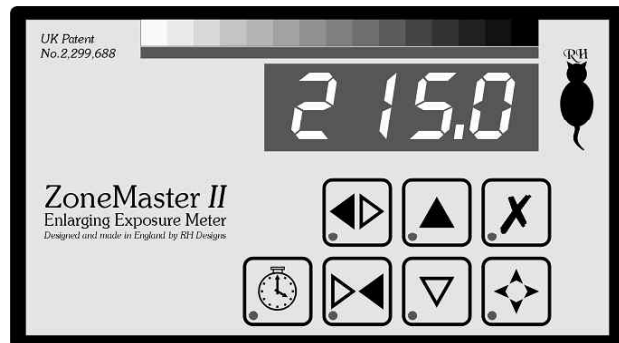


technique. The densitometer feature can be used independently, in which case there is no limit to the number of measurements that can be taken.

- 5 The real power of the ZoneMaster lies in the grey scale display which, in conjunction with the simple exposure and contrast controls, can be used to place important tones in the image accurately (portrait skin tones for example). It can also cope with images that don't have a full range of tones - if there is no highlight for example you can simply place the lightest tone on the exact shade of grey that you desire.
- 6 The calibration feature allows adjustment of exposure and contrast settings to match your own materials, equipment and methods so you can achieve a close match between the ZoneMaster's predictions and the resulting print. If you are not using above-lens or under-lens filters, please read section 17, Enlarger Considerations, before starting to use your ZoneMaster Pro.
- 7 The characteristics of up to eight paper types can be stored in the ZoneMaster's calibration memories, called PAP1 - PAP8. This enables you to make prints on different papers using the same measurements, so you can for example compare prints made on neutral and warm-tone papers, or on papers from different manufacturers.
- 8 Each of the eight PAP memories stores an exposure correction factor and a contrast setting for each of the seven full paper grades from 00 - 5. The calibration process adjusts these settings so that the ZoneMaster knows the precise exposure and contrast characteristics of each paper type, and can therefore indicate to you exactly how a particular negative will print on each paper. See the Calibration booklet for a full description of this.

3. Setting Up

- 1 To set up your ZoneMaster II, plug the Sensor into the socket on the *front* of the main unit. After checking the installation, switch on by pressing the button at the rear. The display will light all segments, then show the firmware version, paper set in use (e.g. PAP 1) and then display the default step-size followed by the initial grade (2) and exposure time (15.0). The



Grade	Durst (max 170M)		Durst (max 130M)		Kodak		Leitz Focomat V35		Meopta	
	Y	M	Y	M	Y	M	Y	M	Y	M
00	115	0	120	0	162	0	135	6	105	0
0	100	5	88	6	90	0	105	12	85	10
0.5	88	7	78	8	78	5	77	11	-	-
1	75	10	64	12	68	10	67	17	60	20
1.5	65	15	53	17	49	23	52	28	-	-
2	52	20	45	24	41	32	39	43	40	45
2.5	42	28	35	31	32	42	32	51	-	-
3	34	45	24	42	23	56	23	62	20	60
3.5	27	60	17	53	15	75	14	79	-	-
4	17	76	10	69	6	102	10	95	10	75
4.5	10	105	6	89	0	150	15	154	-	-
5	0	170	0	130	0	200	0	200	0	200

18. Calibration

Refer to the Calibration Manual for full instructions on calibration.

19. Quick Reference for common operations

Changing the step size.

- Press ▲ and ▼ together.
- Use ▲ and ▼ to scroll through the options, and choose the desired step size.
- Press X to store and exit.

Changing the paper set (PAP number).

- Press ◆ briefly.
- Use ▲ and ▼ to scroll through the options, and choose the desired PAP number.
- Press X to store and exit.

Making a print.

- Remove all filters or set white light. Ensure all safelights are switched off.
- Switch the enlarger on. Compose and focus the image.
- Set the working lens aperture.
- Position the sensor and press and release "Measure". Do not move the sensor until the reading has settled. Repeat as necessary.
- Switch off the enlarger.
- Adjust contrast and exposure if required. Choose the appropriate filter. Set your timer to the indicated time and expose the print.

Making a test strip.

- Set the exposure time if necessary. Compose and focus.
- Press and hold ⌚ to enter test strip mode. Switch off the enlarger. Position the paper.



17.3 Cold light (cold cathode) enlargers

- 1 Cold light enlargers use fluorescent tubes instead of incandescent bulbs, and have very different characteristics as a result. There are a number of different types.
- 2 The oldest type emit a blueish light which is quite dim to the naked eye but highly actinic to photographic paper. This light is not ideal for use with variable contrast paper because it has insufficient green content to obtain the softest grades. If you have such an enlarger, expect to have to make very large corrections to both exposure and contrast; we recommend the addition of a 50Y filter to the enlarger, and that you perform a full calibration of the ZoneMaster.
- 3 Later cold lights use a white tube. These are sold as “suitable for variable contrast papers” and typically work much better with them (together with above-lens or under-lens filters) than the older blue-tubed heads. Again however, because the light source is low in red, you can expect to need a large negative exposure correction to prevent over-exposure, maybe as much as three stops.
- 4 Variable Contrast cold lights such as the Zone VI VC and Aristo VCL heads use green and blue tubes and vary the brightness ratio between them to achieve contrast control. These products usually have a “Focus” setting which should be used as a “white light” setting when taking measurements with the ZoneMaster. You can expect to need large exposure corrections and contrast calibration. The Zone VI variable contrast head is really designed for split-grade printing and as such does not have “grade” settings; you will need to establish the correct settings for the green and blue controls to achieve the correct grade spacing.
- 5 All cold lights are subject to fluctuations in the light level as they warm up. It is therefore important to leave the tubes switched on for as long as possible before starting to print to ensure they are well warmed up. Make sure a minimum of time elapses between taking measurements and making the print.

17.4 Using colour heads








- 1 Colour enlargers have continuously variable yellow, magenta and cyan filters which allow a smooth continuous control of contrast. Combinations of yellow and magenta filtration can be used to approximate the behaviour of standard above-lens or below-lens filters and minimise the need to calibrate your ZoneMaster. The cyan filter is not normally used.
- 2 The settings in the table below will mimic the characteristics of Ilford Multigrade under-lens filters fairly well and allow you to use the filters built into your colour enlarger. Some enlarger models may require an additional exposure correction as filter factors vary.
 - Enlargers using Kodak filtration units: Advena, Beseler, Chromega, DeVere, Fujimoto, IFF, Jobo, LPL, Omega, Paterson, SImnard, Vivitar
 - Enlargers using Durst filtration units: Dunco, Durst, Kaiser, Kienzle, Leitz, Lupo












safe-light should be on and the enlarger off. The front panel of the main unit and its display and controls are illustrated in Fig. 1. The remote sensor houses the metering cell and a push button switch; care should be exercised in handling the remote sensor.

3.1 Controls



There are seven buttons on the main panel, plus one (“Measure”) button on the sensor.

- Print  (start the count-down timer / test strip sequence)
- Harder  (increase contrast by one half-grade)
- Softer  (decrease contrast by one half-grade)
- Darker  (increase exposure by one step)
- Lighter  (decrease exposure by one step)
- Clear  (clear measurements prior to a new negative)
- Calibrate  (choose paper type, adjust calibration)

3.2 Notes on controls

- 1 Several buttons have secondary functions which will be described in later sections of this manual. Refer also to the chart on page 24 which summarises the functions of all the buttons. Some buttons respond differently to a short or a long press. Unless told otherwise, press and release each button briefly - less than one second.
- 2 The Harder / Softer / Darker / Lighter buttons have auto-repeat; press and hold the button to continuously change the grade or time until the button is released.
- 3 To change the step size press  and  simultaneously. Choose the new step size using  and  to scroll through the options (12th, 6th, 4th, 3rd, 2nd). Press  to store and exit.
- 4 The ZoneMaster can store the characteristics of up to 8 different papers, stored in memories called PAP1 through PAP8. To change the paper in use press  briefly. The display shows the PAP number in use. Select the PAP number corresponding to the desired paper using  and . Press  to store and exit. Your measurements are now displayed for the new paper, and the tonal range may differ from the previous paper if the papers have different characteristics. The exposure time is recalculated automatically for the new paper.

4. The Display

- 1 The display has two sections, a numeric display of paper grade and exposure time, and the bar-graph section alongside the grey scale. Refer to fig.2.
- 2 The “Grade” digit shows the currently selected paper grade. Half-grades are shown using the decimal point of the grade digit. The lowest contrast grade (called “00” by Ilford and “-1” by Kodak) is indicated by a small “o”. The grade setting is altered using the  and  buttons.

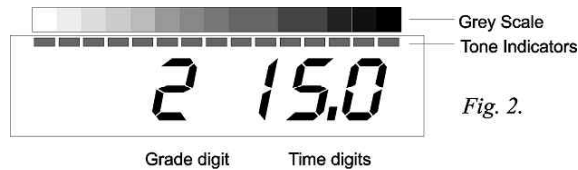


Fig. 2.

- 3 The “Time” display has three digits and shows the currently set exposure time in seconds. When using the count-down timer, the display counts down to zero. The exposure setting is altered using the ▲ and ▼ buttons.
- 4 The bargraph section has 15 LEDs alongside a 15-step grey scale which ranges from off white to near black. The extremes represent “highlights with detail” and “shadows with detail”. In Zone System terms, that’s equivalent to zone 8 to zone 2 approximately. When a measurement is made of the negative, a LED will light up next to the shade of grey which would appear on a print made at the current exposure and grade settings. When either the exposure or the grade is altered, the LEDs move up and down the grey scale to illustrate how the tonal range of the print will change. Increasing exposure (▲) causes all the LEDs to move towards the dark end of the scale and vice versa. Increasing grade (<▶) will spread the LEDs further apart, and vice versa. Using these controls allows full control over the print’s tonal range - for example it’s possible to keep an important tone constant while moving others by using a combination of exposure and grade adjustments.
- 5 The Grade setting can be altered at any time using the <▶ and ▶◀ buttons. The Time setting can be altered at any time using the ▲ and ▼ buttons.

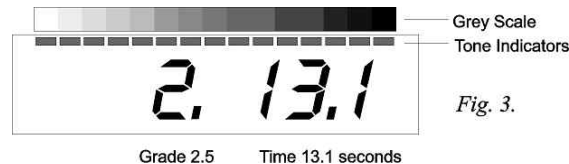


Fig. 3.

Fig.3 shows the result of pressing Harder and Lighter once each, giving a Grade of 2.5 and a Time of 13.1 seconds.

5. Exposure time adjustments

5.1 Setting the time

- 1 Press ▲ to increase exposure by one step, or press ▼ to decrease it by one step.
- 2 To change the step size, press ▲ and ▼ simultaneously. The display shows the current step size. Press ▲ to increase the step size, or ▼ to decrease it. The sizes available are displayed as “12th” (1/12 stop), “6th” (1/6 stop), “4th” (quarter stop) and “3rd” (third stop). When you have set your chosen step size, press X to store it and return to normal.



button for approximately one second until the display shows “LOG”. This first measurement will be displayed as “d 0.00”, and subsequent measurements will be relative to this one. If a subsequent measurement is brighter than the first, “d 0.00” will be displayed and the new measurement becomes the zero point. For meaningful results therefore, ensure that the first measurement is taken from the brightest area (e.g. film base, or negative rebate area).

- 3 To exit Densitometer Mode, press and hold the Measure button until the display returns to the normal grade and time display. Any measurements which were stored before entering Densitometer Mode will have been lost.

17. Enlarger Considerations

17.1 Setting “white light” for measurements

- 1 It is very important when taking measurements from your negatives that you use a consistent and repeatable light setting on your enlarger. This is because the ZoneMaster requires a reference which is independent of any filters or contrast controls. If you are using under-lens or above-lens filters, the simplest way is to remove all the filters from the light path. Almost all colour enlargers have a “white light” lever which moves all the filters out of the light path giving white light. Most variable contrast heads also have a “white light” or “focus” lever which does the same thing. If your enlarger has such a lever, always use it when taking measurements with your ZoneMaster. The simplest way is to remove all the filters from the light path. Almost all colour enlargers have a “white light” lever which moves all the filters out of the light path giving white light. Most variable contrast heads also have a “white light” or “focus” lever which does the same thing. If your enlarger has such a lever, always use it when taking measurements with your ZoneMaster.
- 2 The Leitz V35 variable contrast head has neutral density filters which increase the image brightness for focussing etc. This means the ZoneMaster will require an exposure correction to prevent over-exposure.
- 3 Some enlargers (such as the Ilford Multigrade heads, Zone VI variable contrast heads, etc.) cannot produce white light as they use a combination of green and blue lamps. In such cases, there is usually a “Focus” setting on the controller - switch the controller to “Focus” to establish the reference whenever you take measurements.
- 4 If your enlarger does not have any of the above methods of setting a reference, you will have to remember to take measurements (and calibrate your ZoneMaster) for a repeatable setting of the controls. We suggest setting Grade 2 on variable contrast heads for example, and setting all colour head filter dials to zero. If the head has a neutral density filter, this should also be set to zero.

17.2 Lens aperture






- 1 The lens aperture you set for measurement must always be the same as that you intend to use for the exposure. If it is not, the resulting print will be over- or under-exposed. The actual aperture you use is not important, but you must not change it between making the measurements and the exposure.








blank image area. Fog exposures are easily calculated with the ZoneMaster.

- 2 With no negative in the enlarger, set a small aperture and take a meter reading. Adjust the exposure until the required pale white print tone is indicated, and make the exposure. For flashing (non-intrusive fogging), adjust the exposure until the highlight end LED blinks. (Tip: Use a soft grade setting for fog and flash exposures to leave shadow print density unaffected)

15. User Set-up

This mode allows your preferences to be stored in memory whilst the unit is switched off. Press and hold  while switching on the ZoneMaster, and keep the button pressed until the display shows 'uSEr'. The following options are selected in sequence by further presses of . Press the  or  buttons to select the alternative settings for each option. When finished, press  to store your selections and resume normal operation.

- 1 **Battery Saver.** Alternatives: On or Off. When set to On, the ZoneMaster switches to a standby mode after 30 seconds without a key-press. It can be woken up by pressing any key. Any readings are retained while the meter is in standby. When set to Off, this mode is disabled and the meter remains in normal mode.
- 2 **Display Dimming.** Alternatives: Bright or dim
- 3 **Test Strip Mode.** Alternatives: Incremental or Separate exposures. Separate test strip exposures is equivalent to pressing , , ,  seven times and is used for separate mini test-prints, each of which receives a full exposure.
- 4 **Default Step-size.** Sets the step size selected at switch-on. Factory setting: 1/12th.
- 5 **Default Paper Set.** Sets the PAP channel selected at switch-on. Factory setting: PAP 1.
- 6 **Store and Exit.** Press  briefly to store the preferences and resume normal operation.






16. Densitometer Mode

- 1 In normal use, each time a measurement is taken the ZoneMaster briefly displays the density of the measurement relative to the brightest sample. There is a limit of eight on the number of measurements which can be taken in this way. For convenience when you wish to analyse only the density of negative(s), the ZoneMaster offers a Densitometer Mode. In this mode, the relative density of each measurement is displayed continuously, the light level is not stored, and the print tone indicators are not used. There is no limit to the number of measurements which can be taken. For maximum accuracy, the meter disregards the low intensity end of the light measuring range: if the light levels drops into this range the display will show 'Lo' as a warning. With this system a Dmax of 2.55 is possible, with short measuring times and optimum performance.
- 2 To enter Densitometer Mode, position the sensor in the area you want to use as a reference (e.g. Film base plus fog) and press and hold the Measure




5.3 Making a test strip

The ZoneMaster can display a sequence of 7 exposures to make a test strip. The normal test strip mode is "incremental exposures" - the strip is centred on the currently set time, with three shorter exposures and three longer ones each one step apart. To make it, choose a step size (5.1.2) and then proceed as follows:

- 1 Press and hold . The ZoneMaster enters test strip mode. The display shows "test", then "t" in the Grade digit and the shortest exposure time.
- 2 Position a piece of paper on the enlarger baseboard, set your timer to the time shown on the display and expose the whole of the paper. When the enlarger switches off, press  briefly. The display shows the next exposure time. Set your timer to this time.
- 3 Cover approximately 1/7 of the paper, and expose the remaining paper.
- 4 Cover the next 1/7 of the paper and press , and repeat until the sequence ends automatically; the display shows "End" briefly and then reverts to showing the set grade and time.
- 5 Develop and inspect the test strip. Each exposure on the test strip is one step darker than the previous one so it's easy to set the correct exposure from the test strip. For example if the desired exposure is two steps darker than the centre strip, press  twice. If it is one step lighter, press  once, and so on.
- 6 See "User Options" for the alternative test strip mode which generates a sequence of individual complete exposures.

6. Using the exposure meter - Important points to remember!

- 1 Measurements are stored as they are taken, and will remain in memory until  is pressed or the ZoneMaster is switched off.
- 2 Before taking measurements, remove all filters from the enlarger or set it to "white light" or "focus". It is important that the ZoneMaster has a consistent and repeatable light reference and this is most easily achieved by removing the filters from the light path. If you cannot do this, refer to section 17.
- 3 **Safelights will affect the measurements**, however dim they are. **Switch them off while taking measurements.** We have chosen not to use a safelight filter because they are not 100% effective and would also reduce the meter's sensitivity.
- 4 To take a measurement position the sensor in the desired area of the image, and press and release the "Measure" button briefly. The display shows "busy" while the measurement is taken, after which it briefly shows a display of density. Finally, the display shows the exposure time. A LED illuminates adjacent to the corresponding print tone on the grey scale bargraph.
- 5 If you inadvertently press the "Measure" button for too long the ZoneMaster enters Densitometer Mode - press and hold the button again to exit. See section 16 "Densitometer Mode".
- 6 Do not move the sensor until the display shows the new reading. The measurement will not settle if the sensor sees the light level changing.
- 7 Before making a print exposure, remember to set the filters!



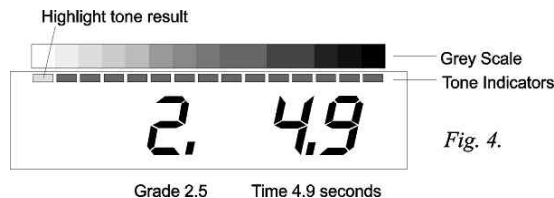
- 8 Changing the Paper Set. The ZoneMaster can store the characteristics of up to 8 different papers. To change the paper in use press “Cal” briefly. Select the PAP number corresponding to the desired paper using ▲ and ▼. Press X to store and exit. Your measurements are now displayed for the new paper, and the tonal range may differ from the previous paper if the papers have different characteristics. The exposure time is recalculated automatically for the new paper.

7. Making your first print

- 1 The following instructions assume that variable contrast paper is in use; we suggest you learn how to use your ZoneMaster using VC paper (ideally Ilford MG IV) even if you will be using fixed-grade papers for most of your work. It is reassuring and instructive to obtain useful results from the start with a minimum of calibration adjustments.
- 2 If you are not using above-lens or under-lens filters please read Section 17, Enlarger Considerations, before starting to use your ZoneMaster II.
- 3 Choose a familiar negative with a wide tonal range from bright highlights to deep shadows, and which you know prints well on a medium grade of paper (1 - 3). Place it in the enlarger and compose and focus the image. Then set the enlarger lens to the aperture which you will use to make the print.
- 4 **Switch off all safelights.**

7.1 Measure the negative

- 1 **Remove all filters** from the enlarger’s light path, or use the White Light or Focus lever to set zero filtration (if your enlarger does not have a white light setting, refer to Section 17). Set the lens to your chosen working aperture.
- 2 Position the sensor in a shadow (clear negative) area of the image and briefly press and release the “Measure” button. During a short delay whilst the sensor settles, the message ‘BUSY’ is shown on the display followed by a brief display of the density (d0.00). **DO NOT MOVE THE PROBE UNTIL THE DISPLAY SHOWS THE NEW READING!** The display indicates a suggested highlight exposure time as shown as in Fig.4. (The



first reading will always be placed at or near the highlight end of the grey scale, irrespective of the actual tone on the negative.) Now position the remote sensor in a highlight (dense negative) part of the image and briefly press and release the “Measure” button. After a delay the measured density range in logarithmic units is shown temporarily (Fig.5) followed by the new exposure time. The new measurement lights a second LED at or near the black end of the grey scale (Fig.6).



13.2 Burning in at a different grade

- 1 The ZoneMaster can calculate the effect of split grade exposures for a single tone at a time. In the landscape example above, say the first print exposure was at Grade 4, and the sky was a pale grey tone. To calculate the burn in exposure for a moody sky at a softer grade follow the simple sequence below:
- 2 Make the first exposure at Grade 4, noting the sky tone indication.
- 3 Change the grade setting to, for example, Grade 1, and change the time until the same sky tone indication is shown. Note this exposure time.
- 4 Change the time to darken the sky tone indication to the desired level. Note this longer exposure time.
- 5 The required burn in exposure time is the difference between the previous noted times. This is much easier to do than to explain in writing!

13.3 Adjusting Exposure and Contrast for Portraiture etc.

- 1 The skin tones in a Black and White portrait are critical. After using the ZoneMaster for a short while it will become apparent which print tones best represent skin highlights and shadows. By altering the contrast and exposure settings it will be possible to place the skin tones, clothing and backgrounds on the required grey tones.
- 2 Remember that an increase in grade will widen the gap between two tones, but may require some dodging and/or burning in to restore the correct tones in other areas. The reverse is of course also true. After some experience you will learn the feel of the various controls and how they interact, allowing you to control the exact appearance of the print with minimal effort.

14. Other useful techniques

14.1 Contact Sheet Exposures

- 1 It is good practice to make a contact sheet of the entire film before printing. To get the maximum information from the film it is often best to use a soft grade of paper, i.e. Grade 1 or 0. The meter can be used quickly and easily to determine the optimum exposure for this contact sheet.
- 2 With no negative in the enlarger, set a medium aperture, turn the enlarger on and place a piece of clear negative over the remote sensor window. Set the enlarger head high enough to cover the whole area of the contact sheet. Take a light measurement; this gives a highlight indication. Check/set the meter grade, and set up the enlarger filtration accordingly
- 3 Using the Darker button, increase the time until the LED moves to the far shadow end of the bar-graph (the black end). Turn the enlarger off and place the contact sheet maker under the enlarger.
- 4 Set your timer to the indicated time and expose your contact sheet. If there are some very dark areas on the print, it is sometimes possible to detect the presence of detail by placing the print over a light-box or similar.

14.2 Calculating Fog and Flash Exposures

- 1 Fog exposures are just faint exposures of a blank image onto paper. They can be used to accentuate fine highlight detail or to put tone in an otherwise



you can achieve this with one exposure. This is where the ZoneMaster excels.

- 2 Take readings from the sky, the shadow area, and the important mid tones. Positioning the extreme measurements at the ends of the grey scale results in the mid tones being displaced too far to the dark end of the scale (Fig.11a). Ignore the sky reading for the moment. Increasing the grade setting separates the mid tones and shadow areas but usually results in the extreme LEDs flashing. Decrease the time setting until LED representing the shadow area just stops flashing. Optimum shadow separation occurs one or two steps from the end of the grey-scale. The mid tones should now be close to the required shades of grey. Continue to adjust the grade and exposure settings until these tones are where you want them. (Fig.11b). Expose the whole of the print at these settings - this is called the “base exposure”. Make a note of the base exposure time.
- 3 Now increase the exposure time until the LED representing the sky area stops flashing, or until it shows the desired sky tone (Fig.11c). The new exposure time indicated is that required to place the sky tone at the desired level. Because the print has already received the base exposure, the additional exposure for the sky is the time that is currently set minus the base exposure. Subtract the “base exposure” time from the indicated time to get the burn-in time, and set your timer to this time. Expose the paper, remembering to mask all of the print except the sky area to be burned in.
- 4 With practice, you will find that you can control individual areas of the print very accurately using this method. For finest control use a step-size of 1/12th stop.

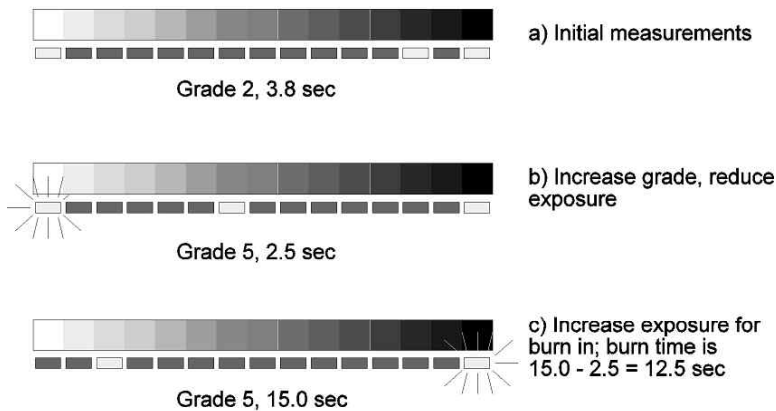


Fig.11. Burning in

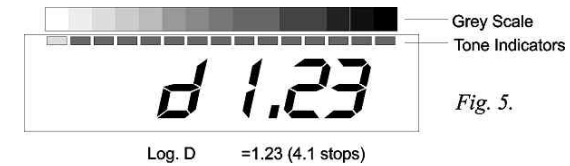


Fig. 5.

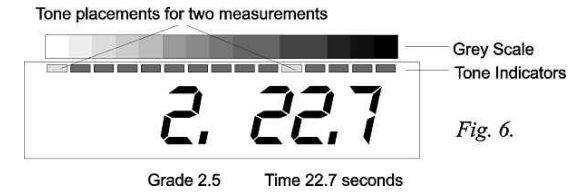


Fig. 6.

- 3 Switch the safelights back on if required.

7.2 Adjust the contrast setting

- 1 If the shadow LED is not at the black end of the grey scale but adjacent to a grey tone, this indicates that the contrast range of the negative is smaller than that of the paper. Press \triangleleft to increase the paper grade setting until the shadow LED moves to the extreme right of the grey scale. If you increase the grade too far, the LED will flash to warn you that shadow detail will be lost (Fig.7).

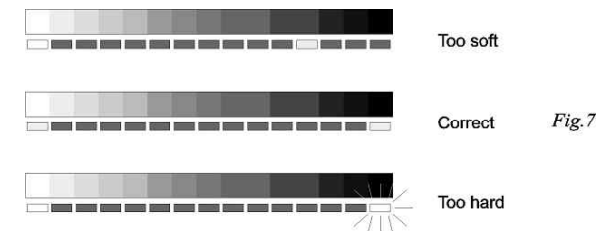


Fig.7

- 2 If the LED at the black end of the grey scale is flashing, this indicates that the contrast range of the negative is too great for the paper grade setting. Press \triangleright to reduce the grade setting until the LED just stops flashing and is at the black end of the scale.
- 3 Do not be alarmed if the grade and time settings on the ZoneMaster are significantly different from those you have used in the past with the same negative; there are a number of possible reasons for this which we'll come to later (see section 11).

7.3 Make the print

- 1 If you are using a standard enlarger, choose the filter, or set your enlarger filtration, for the grade indicated on the ZoneMaster's grade display. If you



are using a colour enlarger, use the dual-filter (yellow and magenta) settings given in Section 17.4 which are a reasonable match to Ilford filters. Single filter settings will give erroneous results. For other enlarger types such as cold light, refer to Section 17. **Don't change the lens aperture!**

- 2 Place a piece of paper on the easel, set your timer to the time shown on the ZoneMaster's display, and expose the paper.
- 3 Process and dry your print and examine it carefully. In most cases, if you are using Ilford MG IV paper and a standard enlarger with tungsten/halogen illumination and a VC filter set, the print will be close to being correct in both exposure and contrast. If it is not, the following sections (8 - 9) explain how to correct for this.

8. Print too light or too dark

- 1 NOTE - judge exposure only from the highlights! If the highlights are correct but the print is too dark then contrast is too high, and vice versa. Exposure is too light if the highlights show any burned out areas of paper-base white. Exposure is too dark if the highlights are muddy grey.

8.1 Print is fairly close to the correct exposure but a little too light or too dark



Too light

Correct

Too Dark

Fig.8.

- 1 This is easily corrected by making a test strip to determine the correct exposure.
- 2 Set your ZoneMaster's step size to 1/4 stop (see section 5.1.2.) This is a convenient size for medium paper grades. Use a finer step size for grades 4 and 5, and a coarser one for grades 0 and 00.
- 3 Without altering any of the ZoneMaster's settings, press and hold to enter test-strip mode (refer to section 5.4).
- 4 Place a piece of paper in the easel, set your timer to the indicated time and expose the whole of the paper. Press again and set your timer to the indicated time. Cover a strip of paper (about 1/7th) and expose the rest of the paper. Repeat this sequence, progressively covering the paper, for the complete test strip sequence of seven exposures (Fig.9). Process and dry your test strip, and examine it carefully.
- 5 One strip should be correctly exposed. If, for example, it is two strips to the darker side of centre, this indicates that the correct exposure is two exposure steps more than the ZoneMaster's calculations. If it is one strip to the lighter side, that means one step less than calculated. The number of steps



come as a surprise to learn that stained negatives seem to affect fixed-grade papers more than variable contrast types.

- 10 Apart from those in 11.5, most of the above factors can be calibrated out as long as they are consistent.

12. More advanced Metering

- 1 Multi-spot metering. The ZoneMaster can measure and store up to eight light readings from any one negative. In general, you will measure the highlight and shadow areas first in order to determine optimum exposure and contrast. In many cases the mid tones may be the most important parts of the image, and measurements from those areas will show how they relate to the highlights and shadows. Using the Grade and Exposure buttons together with the grey scale you can observe the tonal relationships between important areas of the print and how they change relative to each other without the need to make test prints. This can be very useful for portraiture for example, in which it is important to place skin tones accurately. Remember that exposure is calculated ONLY from the brightest highlight measurement - the mid and shadow tones will be indicated on the grey scale but do not affect the exposure time.
- 2 The LED representing the most recent measurement will flash briefly to assist identification. During this period, the display shows the relative density of the negative as a log.D figure (refer to Fig.5). The density measurements are always relative to the brightest measurement so for them to be useful ensure that you measure the brightest negative area (deepest print shadow) first.
- 3 If the exposure time required to print the measured negative is out of range (too short or too long), press **X** to clear the measurements, adjust the lens aperture accordingly, and repeat the measurements.
- 4 The **X** key can be used at any time to clear the current measurements, but this will not affect the indicated exposure time or paper grade setting. If no measurements are stored, pressing **X** will restore the switch-on defaults of grade 2, 15.0 seconds.
- 5 Switching to a different paper set (see 3.2.5) will illustrate the results obtained on the new paper; measurements are stored, and the exposure time will be recalculated to suit the new paper setting. **It is not necessary to retake measurements when changing papers.**
- 6 An attempt to take more than eight measurements results in the display showing "EEE" and the most recent measurement will be ignored.

13. Burning-in

13.1 Burning in at the same grade

- 1 A familiar problem, particularly to the landscape photographer, is the presence of an area in the negative which is much denser than the remainder such as a bright sky. Metering the sky and the deepest shadows usually results in the mid tones being squashed up against the black end of the grey scale and this would produce a very unsatisfactory print. If the you want deep shadows with mid grey grass and detail in the sky, it is unlikely that



- 10 When you've entered your correction factor(s), press \odot . The display will show "cont" and then finally "o 179" or similar. Press \odot again to return to normal operation. Your exposure corrections have been stored. Measure your test negative again to see whether the exposure is now correct.

11. Factors affecting exposure and contrast

- 1 Print exposures are much more critical than film exposure, and a difference of a small fraction of a stop can have a noticeable effect on the print. As a result, even if you are using the recommended paper your first prints may turn out to be incorrectly exposed. The following sections explain some of the factors that affect print exposure.
- 2 **Enlarger type and illumination.** Most enlargers use a tungsten or tungsten/halogen lamp and either condenser or diffusion illumination systems. These will generally give good results with standard Ilford filters. However, "cold cathode" or "cold light" enlargers use fluorescent tubes which have markedly different characteristics to the standard tungsten lamp. In general, the low red content of cold light will cause the ZoneMaster to over-expose, by as much as 2 or 3 stops. If you use a cold light enlarger, do not be surprised if you need a large correction of exposure. Older cold lights that are not designed specifically for variable contrast paper tend to produce harder contrast. This can be compensated for to some extent by using an additional 50Y filter, but even with additional filtration the softest grades may not be achievable.
- 3 **Filter types.** Colour heads and Variable Contrast heads often have characteristics significantly different to Ilford filters. Some also have neutral density filters to give a brighter image for focusing purposes. Both factors can influence both exposure and contrast. If you are using a colour head we recommend using dual filter settings (i.e both Y and M for each grade) as these more closely match the Ilford Multigrade filters. Use the filtration settings on page 23, ensuring you choose the correct columns in the table for your particular enlarger.
- 4 **Developer type and temperature,** development time, agitation and age can all affect both print exposure and contrast. Use fresh chemicals and learn to be consistent with your development techniques.
- 5 **Unsafe safelights,** leaking blackouts, baseboard reflectance and enlarger light leaks can all affect print contrast, particularly in the highlights.
- 6 **Filter age,** accuracy, type, and settings will affect print contrast.
- 7 **Enlarger lamp** colour, age, voltage fluctuations, warm-up and cool-down can affect exposure and contrast.
- 8 Different standard b+w films will not generally have much effect. However, **chromogenic films** such as Ilford XP2 will give different results and will typically require increases in both exposure and paper grade settings. If you use this type of film, it is worth dedicating one or more paper calibration channels to this film type. The characteristics of chromogenic films can also depend on the ISO speed at which they are exposed.
- 9 **Pyro** and other staining developers may or may not affect results. Our experiments have shown that the results from these developers can be unpredictable and the only advice we can offer is to "try it and see". It may

is the exposure compensation that is necessary for that paper type and grade combination. Fig.9 shows a correctly exposed test strip. If there isn't a correctly exposed strip, go to section 8.2.

- 6 Change the ZoneMaster's exposure setting by the amount just determined from the test strip. For example, if the required exposure is two steps darker than recommended, press \blacktriangle twice, and so on.
- 7 Make a note of the exposure change (in steps), the step size and the grade setting; you can use these later on to correct the ZoneMaster's measurements so that future prints at that setting will be correctly exposed - see section 10.
- 8 Make another print; this one should be correctly exposed.

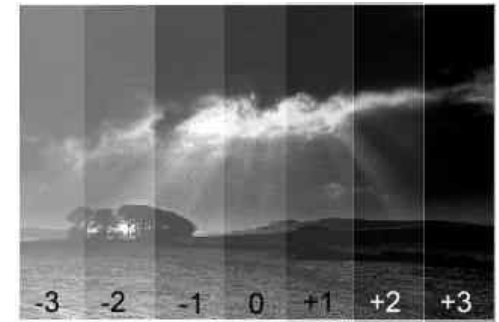


Fig.9

8.2 Print is much too light or much too dark

- 1 First of all check that you have taken the measurements in white light, with all safe-lighting switched off, and then remembered to replace the filters in the enlarger. This is an easy mistake to make!
- 2 There are many possible reasons for a result which is a long way out from the calculated exposure; these include the type of enlarger illumination and the type and age of the filters in use. See section 11 for a discussion.
- 3 To find the exposure compensation required when the amount is greater than the test strip method in 8.1 can accommodate, first increase or decrease (as appropriate) the exposure time by five steps. Then make a test strip as described in 8.1 above. You should find that you have a correctly exposed area on the test strip. If still more compensation is required, increase the offset by another 5 steps and try again. To work out the compensation necessary, don't forget to add the initial offset to the figure you derive from your test strip; for example, if the offset on the test strip is -1, and you've already increased the exposure by five steps, then the required figure is -1 + 5, or 4 steps.
- 4 Make a note of the exposure change (in steps), the step size and the grade setting; you can use these later on to correct the ZoneMaster's measurements so that future prints at that setting will be correctly exposed - see section 11.
- 5 You can continue to use your ZoneMaster for printing by adjusting the exposure by the required amount each time you make a print, but we suggest you enter the figures into the calibration memory as described later on so that the ZoneMaster's calculations will in future be correct without manual intervention. See section 10, Exposure Correction.



9. Print too soft or too hard

- 1 NOTE - do not attempt to judge contrast until the exposure is correct! Judge exposure only from the highlights! The print is too hard if the shadows show areas of dense black with no detail. The print is too soft if there is no true black in the shadows.
- 2 This situation is unlikely if you are using standard VC filters, although bear in mind that both your choice of measurement points and your own personal taste will affect the result. Many people have a tendency to print too hard and are often surprised at the amount of detail that suddenly appears when printing with the ZoneMaster!
- 3 The extremes of the grey scale are not paper-base white and maximum black; they represent the points at which the sensitivity curve of the paper starts to flatten out and detail is lost. In Zone System terms, this represents zones 2 and 8 approximately. If you like a punchy print, you may find that setting the grade and exposure so that the LEDs just flash gives you a result more to your taste.



Too Hard



Correct
Fig.10.



Too Soft

- 4 If the print is too soft, remember that if any of your measurements were from an area with little or no detail on the negative, then the grade and exposure should be chosen so that the corresponding LED is flashing.
- 5 If the print is too hard, check the image area(s) that you measured. Are they true highlights and/or true shadows? If the subject is a portrait and you measured a skin highlight, this is unlikely to be a true highlight. Increase the exposure to place the "highlight" against a darker tone. You will soon learn from experience how to interpret the grey scale and how to place tones.
- 6 If you are using a colour or VC head, the filter settings may not correspond exactly to those of discrete filters. You have two choices under these circumstances; either you can adjust your enlarger's filtration to match the contrast range of the ZoneMaster, or you can adjust the ZoneMaster's settings to match your enlarger. Of course, you can also simply make adjustments using the grade settings - after some practice you will learn how the grey scale indicators correspond to the results you obtain; if your favoured result involves flashing LEDs, that doesn't indicate a problem, it is merely a warning of possible detail loss.
- 7 If after checking through the above sections your prints are still too hard or too soft, this indicates the need for calibration. Please refer to the Calibration Manual for more information.



10. Exposure Correction

- 1 If your prints are consistently dark or light you will want to correct your ZoneMaster's exposure measurements so that you don't need to make a manual correction every time you want to make a print. Carrying out a full calibration as explained in the accompanying Calibration Manual is the best way to do this; however while you are learning to use your ZoneMaster it is often sufficient to make a "quick and dirty" correction based on your experience when making your first few prints, as follows.
- 2 Each full grade setting has its own correction factor, so try several negatives at each grade setting to determine whether the required corrections are consistent. If they are not, and you find a different correction is needed for each negative, then your metering technique is probably inconsistent. Remember that exposure is determined only by the highlights - ignore the shadows and mid-tones when estimating exposure corrections - and be sure to choose areas on each negative which represent highlights that just retain detail.
- 3 If you followed the instructions in section 8 you will have made a note of the grade setting and the exposure compensation required for your print. The exposure correction is entered in units of 1/12 stop, so if you are using a step size other than 1/12 you will need to multiply your compensation by the number of 12ths in your chosen step size. For example, if your step size was 1/4 stop, multiply your compensation by 3 because there are 3 twelfths of a stop in one quarter stop. The result is the exposure correction factor for the paper grade setting you used.
- 4 Example 1: Your print was made at grade 1, and required a compensation of 9 steps. Your step size was 1/12 stop. So your correction factor at grade 1 is +9.
- 5 Example 2: Your print was made at grade 3, and required a compensation of -2 steps. Your step size was 1/3 stop. There are four twelfths in one third, so your correction factor at grade 3 is -8. ($-2 \times 4 = -8$).
- 6 The correction factors are entered into the ZoneMaster's calibration memory as follows:
- 7 Press \blacklozenge for one second or more. The display shows "Cal", then "PAP1", then "OFF" (abbreviation of "offset"), and finally shows "o 00". The grade digit is showing the set grade, currently "o" (Grade 00), and the time display shows the correction factor, currently zero.
- 8 Set the grade for which you have a correction factor, using the \blacktriangleleft and \blacktriangleright buttons. Now use the \blacktriangle and \blacktriangledown buttons to adjust the time display so that it shows your correction factor. In example 1 (10.3.1 above) when you're done the display would be showing "1 09", and in example 2 (10.3.2 above) it would be showing "3 -08".
- 9 Often the correction factors are similar for each grade so at this point, you can set the same factor for every grade. This will probably mean that your ZoneMaster will be closer on all grades, not just the one for which you have a correction factor, although often grades 4 and 5 will need to be corrected separately - this is because the high contrast makes them very sensitive to small corrections.