Safelight socket at the back of the Analyser.

4 **NOTE:** Sodium safelights such as the Duka 50 must NOT be connected to the timer as they must be left switched on. If you are using such a safelight you will need to cover it up when taking measurements, to avoid inaccuracies.

Completing and checking the Installation

When you have completed the wiring, plug the Analyser's mains lead into a convenient mains socket. Plug the remote sensor cable into the socket marked "Sensor" on the front panel, and plug in the footswitch if required. Switch the Analyser on. The safelight (if connected) should illuminate. If it does not, or the timer display does not come on, switch off and check your wiring, and any fuses. If everything is satisfactory, press Focus. The enlarger should now switch on. Again, if it does not, or the timer display does not come on, switch off and check your wiring, and any fuses. If everything is satisfactory, you are ready to start printing.

Helpline

If you need any more help or information, contact RH Designs on 01969 667776 An answering service is available on this number.

We also offer a technical support service by e-mail, and support information is available on our website at http://www.rhdesigns.co.uk.

If a fault develops please contact us for advice before sending the unit for service. Many apparent faults can be rectified without the need to return the unit.

Fuse Information

1 The fuse fitted to the rear panel of the Analyser Pro protects both the Analyser itself and anything connected to it - i.e. your enlarger and safelight. Should this fuse blow, check the installation before replacing it. **Disconnect all cables** from the Analyser Pro, and, using a screwdriver or other blunt instrument, press in and rotate the fuse carrier anticlockwise. The fuse can then be removed and tested. After replacement with the same type and rating of fuse (T4A for 200-250V models, T5A for 100-125v models), test the Analyser Pro's operation before re-connecting your enlarger and safelight.

2 If all is well, you can test the enlarger by removing the enlarger and mains plugs from the Analyser's rear panel connectors, and connecting them together (they will mate). The safelight can be tested similarly. If the plug fuse blows in either case, the fault lies with the enlarger or safelight and these should be repaired before reconnecting them to the Analyser Pro.

3 If, after replacing a blown fuse in the Analyser Pro it still does not operate, call RH Designs for advice. **Do not attempt to open the unit as there may be dangerous voltages inside.**

Analyser *Pro*
Enlarging Meter and Timer

Operating Instructions

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Firmware version 6.4

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Mill Fosse House, Hawes, North Yorkshire DL8 3QF
Tel / fax: 01969 667776

CONTENTS OF THE PACKAGE

The Analyser package contains the following items: the Analyser control box together with its remote sensor, a mains lead fitted with a plug, a footswitch, and two IEC connectors for your enlarger and safelight. In addition there are copies of this manual and the Calibration Manual. If any of these items are missing or damaged contact your supplier immediately.

CAUTION

Please read these instructions carefully and fully before installing or using your Analyser.

WARNING: THIS APPLIANCE MUST BE EARTHED

The mains lead supplied with the unit is fitted with a moulded plug suitable for use with the standard mains outlets in your country. If the lead is not suitable, obtain a replacement. If this is not possible, the plug must be cut off leaving as little free lead as possible *and disposed of immediately*. Severe electric shock hazard will exist if a cut-off plug is plugged into a live outlet! A suitable replacement plug should then be fitted to the lead. If a fused plug is used, it should be fitted with a 5A fuse.

For continued protection against fire hazard, replace only with the same type and rating of fuse. (Fuse rating T4A.) Repair service is available - return the unit to RH Designs if repairs become necessary. ***Do not attempt to open the unit or to remove any covers. Doing so may expose dangerous voltages.*** Do not drop the unit or subject it to mechanical shock or extremes of temperature or humidity.

Like other electronic equipment, The Analyser can be damaged by water or chemical spillage. Do not install this equipment where it may be subject to water or chemical spillage or splashes. Should such spillage occur, disconnect the equipment from the mains supply before attempting to clean it.

GUARANTEE

This equipment is guaranteed against faulty components or manufacture for a period of two years from the date of original purchase. Should a 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.
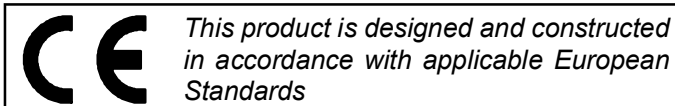
C E *This product is designed and constructed in accordance with applicable European Standards*

Fig.12 Analyser Pro rear panel

1. Loosen and remove the retaining screw and remove the cover

2. Remove the cord grip and thread the mains lead through the strain relief tube

3. Connect mains wires as shown:
Green & Yellow wire (Earth)
Brown wire (Line)
Blue wire (Neutral)
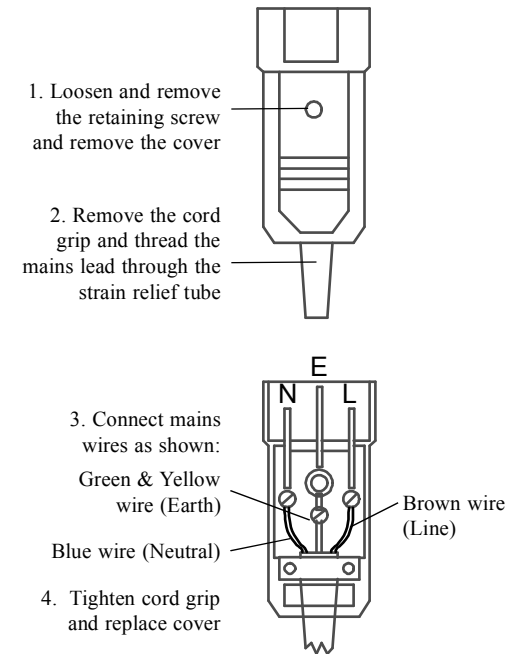
4. Tighten cord grip and replace cover

Fig.13 Connector Wiring Diagram

Installation Guide

CAUTION: Like other electronic equipment, the Analyser can be damaged by water or chemical spillage. Do not install this equipment where it may be subject to water or chemical spillage or splashes. Should such spillage occur, disconnect the equipment from the mains supply before attempting to clean it. Do not install this equipment where it may be subjected to extremes of temperature or humidity.

Conventional Enlargers

The Analyser functions as a mains switch, and in most cases installation simply consists of connecting the timer to the mains, and then connecting the enlarger's mains lead to the socket at the rear of the unit. Most conventional enlargers use low voltage bulbs fed from a transformer (e.g. Durst, LPL etc.), and the Analyser can control such loads of up to 750W (most enlargers are 100 - 250W). The Leitz Focomat has a built-in transformer and can be connected directly. If your enlarger is of this type, go to "Connecting your enlarger and safelight".

Cold Cathode Enlargers

Most Cold Cathode enlargers can be safely controlled by the Analyser; the timer's internal relays can cope with the high switch-on currents demanded by such enlargers. The maximum rating of the relays is 10A surge. If you are in doubt, consult the manufacturer of your enlarger, or RH Designs direct.

Stabilisers

1. Most stabilisers will work quite happily with the Analyser. If the stabiliser produces a mains voltage (240v or 120v) output, connect it to the mains and the Analyser's mains lead to the Stabilised output. If the stabiliser produces a 12v or 24v output to drive the enlarger bulb directly, connect the mains input to the stabiliser unit to the Analyser's Enlarger socket. The DeVere Transtab unit has connections for a timer and a dedicated connecting lead is available from us. If you are in doubt, consult the manufacturer of your stabiliser, or RH Designs direct.

2. Note that some low voltage stabilisers, in particular certain Durst and Kaiser models, have a short switch-on delay before the enlarger lamp illuminates. If you have one of these models the Analyser Pro can compensate for this delay; refer to Section 15.9 and switch the Soft-start delay feature "on".

Connecting Your Enlarger and Safelight

1. **CAUTION: Before proceeding further, in the interests of safety disconnect the Analyser's mains lead from the supply socket.**

2. In most cases, you will need to remove the existing mains plug from your enlarger and replace it with one of the IEC connectors supplied with the Analyser. A wiring diagram is shown in fig.13. If you are in any doubt as to how safely to wire up the connectors, consult a qualified electrician. When you have fitted the connector, plug it into the Enlarger socket at the back of the Analyser.

3. Similarly, if you wish to use the automatic safelight switching facility, fit the second IEC connector to your safelight mains lead and plug it into the

Contents

PLEASE NOTE:

Switch off the unit before plugging in or unplugging the sensor or footswitch cables.

SAFETY WARNING:

This unit is designed for the control of photographic enlargers and safelights only. Connection of any other equipment to this unit may result in fire or shock hazard and will invalidate all warranties.

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1. Introduction

1. Thank you for choosing the Analyser Pro, the f-stop enlarging meter / timer designed by photographers for photographers. Please read these instructions carefully before installing and using it.

2. The Analyser Pro 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 Analyser Pro combines an f-stop enlarger timer and an 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 Analyser Pro uses a completely new sensor offering greater accuracy, stability and speed than ever, and is supplied with test materials to assist calibration.

2. Features

2.1 Timer section

1. Unlike conventional timers, the Analyser's timer 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 (1/2 stop). We call this setting the "Step size". There are two buttons on the Analyser which adjust exposure, called "Darker" and "Lighter", and a single press of either button changes the exposure by one step. The timer also incorporates compensation for paper reciprocity failure, improving accuracy with large prints or dense negatives.

3. "Burning-in" is a term which refers to the darkening of a specific area of the print by giving it extra exposure. The Analyser's timer achieves this very simply; after making the initial exposure (called the "base exposure"), just increase the exposure setting by the required burn-in and press the Print

Button Quick Reference Chart

Button	Symbol	Short Press	Long Press
Print	☐	Start / Pause / Resume Exposure	Start a Burn-in Exposure
Focus	✳	Switch Enlarger on/off	Enter User Setup Mode
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

Notes.

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 ✗ 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 ✗ to store and exit.

Making a print.

- Remove all filters or set white light. If they are not controlled by the Analyser, ensure all safelights are switched off.
- Press ✸. The enlarger switches 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.
- Press ✸. The enlarger switches off.
- Adjust contrast and exposure if required. Choose the appropriate filter. Press ☽ to make the print.

Making a test strip.

- Set the exposure time if necessary. Press ✸ to compose and focus.
- Press ☽. The enlarger switches off. Position the paper.
- Press ☽ and expose the whole of the paper.
- Cover 1/7 of the paper. Press ☽ to expose the remaining paper.
- Repeat until the sequence ends.

Using the Burn-in Feature

- Determine the base exposure and grade settings in the usual way.
- Press ☽ to expose the whole of the print for the base exposure.
- 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. Press and hold ☽ for one second to start timing the burn-in exposure.

button for one second. The Analyser subtracts the base exposure time from the new time and times the difference.

4 When required, test strips can be made quickly and easily using the built-in test strip generator which produces a sequence of 7 exposures, each one step darker then 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.

5 The timer can be used on its own without the need to make an exposure measurement first. Simply set the time you require and press the Print button to start the exposure.

2.2 Exposure Meter Section

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 Analyser 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 Analyser 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 Analyser 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 Analyser to place the darker LED next to the black end of the scale. Then, choose the appropriate filter (as displayed by the Analyser) and press the Print button to expose the paper.

4 The Analyser'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 Analyser 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 higlight 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 Analyser'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 Analyser Pro.

7   The characteristics of up to eight paper types can be stored in the Analyser'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 Analyser 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 Analyser Pro, first follow the instructions in the Installation Guide on Page 26 of this booklet. After checking the installation, switch on 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 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

Fig.1. The Remote Sensor and Control Box Front Panel

not control the brightness of the tubes. 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. Switch off the Analyser Pro's lamp saver function (section 15.2) so that the enlarger can be left switched on in "focus" mode indefinitely. 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 Analyser. 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, SImmard, Vivitar

•   Enlargers using Durst filtration units: Dunco, Durst, Kaiser, Kienzle, Leitz, Lupo

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.

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 Analyser Pro.

2   The Leitz V35 variable contrast head has neutral density filters which increase the image brightness for focussing etc. This means the Analyser Pro 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 Analyser) 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 taking the measurements and exposing the print.

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 buy 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 Analyser Pro.

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 Analyser - do not simply rely on the ✳ button because this does

the remote sensor.

3.1 Controls

There are eight buttons on the main panel, plus one ("Measure") button on the sensor.

- Print   ⏱   (start / pause / resume / burn-in exposure)
- Focus   ✳   (switches the enlarger on and off for focusing)
- 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 25 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 foot switch has exactly the same functions as the ⏱ button, and either can be used at any time.

3   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.

4   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.

5   The Analyser 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.

Grey Scale
Tone Indicators

Grade digit   Time digits
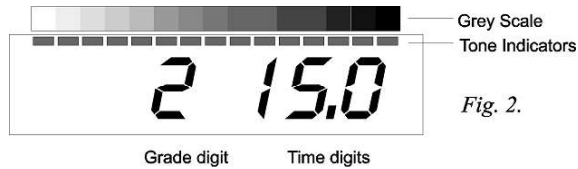
3 The "Time" display has three digits and shows the currently set exposure time in seconds. During the exposure, the display counts down to zero. The exposure setting is altered using the ▲ and ▽ buttons.

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.

Fig. 3.

Grey Scale
Tone Indicators

Grade 2.5   Time 13.1 seconds
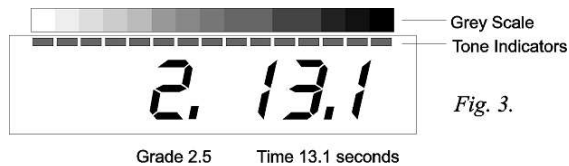
5 The Grade setting can be altered at any time using the ◁▶ and ▷◀ buttons. The Time setting can be altered at any time using the ▲ and ▽ buttons. Fig.3 shows the result of pressing Harder and Lighter once each, giving a Grade of 2.5 and a Time of 13.1 seconds.

5. Using the timer

The Analyser's timer section can be used on its own as a straightforward enlarger timer, there is no need to take any light measurements. All the features described in 5.1 below can also be used when exposure measurements have been taken and stored.

5.1 Setting the time

1 Press ▲ to increase exposure by one step, or press ▽ to decrease it by one step.

7 **Default Step-size.** Sets the step size selected at switch-on. Factory setting: *1/12th*.

8 **Default Paper Set.** Sets the PAP channel selected at switch-on. Factory setting: *PAP 1*.

9 **Soft Start Feature.** Alternatives: On or *Off*. When set to On, this feature allows an optional 0.5 second exposure time to be added to the displayed exposure time to allow for some stabilised enlarger transformers which have a short switch-on delay. Some Durst and Kaiser models are in this category.

10 **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 Analyser 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 Analyser 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, switch on the enlarger using ✹. Press and hold the Measure button for approximately one second until the display shows "LOG". Press and release the Measure button to take a density measurement. 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). For optimum results set the light level so that it is just below the point at which the first measurement display stops showing "HI".

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 Analyser 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

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 with the ✷ button and place the contact sheet maker under the enlarger.

4 Press ⊕ to 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 blank image area. Fog exposures are easily calculated with the Analyser.

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

1 This mode allows your preferences to be stored in memory whilst the unit is switched off. Press and hold ✷ 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. Factory settings are shown in *italics*.

2 **Lamp Saver.** Alternatives: *On* or Off. When set to On, the enlarger lamp will be switched off after 5 min in Focus mode.

3 **Display Dimming.** Alternatives: *Bright* or dim

4 **Beeper.** Alternatives: On or *Off*. When set to On, a metronome beep sounds each second during exposure

5 **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.

6 **Safelight Mode.** Alternatives: On or *Auto*. On: the safelight is off when the enlarger is on. Auto: the safelight is off during measurements and printing.

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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), "3rd" (third stop) and "2nd" (half stop). When you have set your chosen step size, press ✗ to store it and return to normal.

5.2 Focusing and composing the image

1 Press ✷ to switch on the enlarger so you can compose and focus the image.

2 Press ✷ again to switch the enlarger off before making the exposure.

5.3 Making the exposure

1 Press and release ⊕ briefly to start the exposure. The enlarger switches on and the display begins a countdown of the set time. When the time reaches zero the enlarger switches off.

2 If required, during the exposure press ⊕ to pause (the enlarger switches off) and then again to resume, or press any other key to abort the exposure and switch the enlarger off immediately.

5.4 Making a test strip

The timer can generate 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 ✷ to switch on the enlarger, and compose and focus the image.

2 Press ⊕. The enlarger switches off and the Analyser enters test strip mode. The display shows "test", then the step size, then "t" in the Grade digit and the shortest exposure time.

3 Position a piece of paper on the enlarger baseboard, and press ⊕ to expose the whole of the paper. When the enlarger switches off the display shows the next full exposure time, followed by "t" in the Grade digit and the incremental exposure time.

4 Cover approximately 1/7 of the paper, and press ⊕ to expose the remaining paper.

5 Cover the next 1/7 of the paper and press ⊕, and repeat until the sequence ends automatically and the display reverts to showing the set grade and time.

6 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.

7 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 The meter function operates only while the enlarger is switched on in "focus" mode. Measurements are stored as they are taken, and will remain in memory until ✗ is pressed or the Analyser 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 Analyser 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   If you have not wired your safelight(s) into the Analyser's Safelight socket, switch them off while taking measurements. **The safelight will affect the measurements**, however dim it is. 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 safelight is switched off. The display shows "busy" while the measurement is taken, after which it briefly shows a display of density. Finally, the safelight switches on again, and 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 Analyser 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 and the safelight has been switched back on. 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 Analyser 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 ✗ 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 Analyser 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 Analyser Pro.

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 press ✱ to compose and focus the image. Then set the enlarger lens to the aperture which you will use to make the print.

4   If you have not wired your safelight into the Analyser's safelight socket, switch it off now.

7.1 Measure the negative

1   **Remove all filters** from the enlarger's light path, or use the White Light or

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".

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. Expose for the difference by simply pressing the ⏲ button for one second or longer, remembering to mask all of the print except the sky area to be burned in. A long press of ⏲ causes the Analyser Pro to subtract the base exposure from the current time.

4   You can use this technique as many times as you wish on the same print. For example, to give a quarter-stop edge burn to a print that has had a base exposure, increase the time by a quarter stop and then press and hold ⏲ four times, once for each edge to be burned in. A short press of ⏲ at any time establishes a new base exposure.

5   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.

13.2 Burning in at a different grade

1   The Analyser 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 Analyser 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.

3   If the exposure time required to print the measured negative is out of range (too short or too long), press ✗ to clear the measurements, adjust the lens aperture accordingly, and repeat the measurements.

4   The ✗ 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 ✗ 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 you can achieve this with one exposure. This is where the Analyser 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
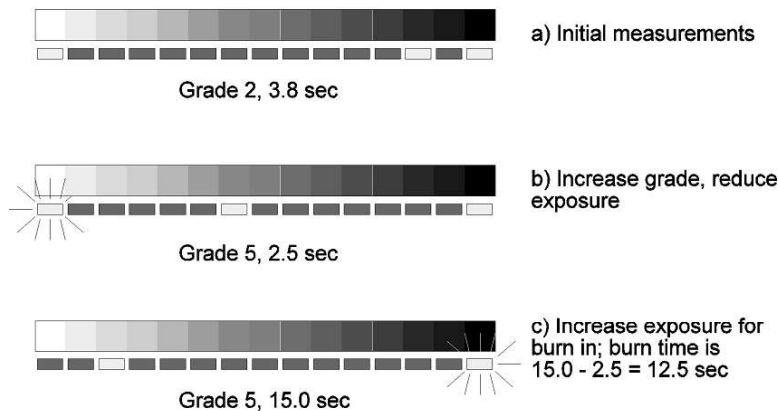

a) Initial measurements

Grade 2, 3.8 sec

b) Increase grade, reduce exposure

Grade 5, 2.5 sec

c) Increase exposure for burn in; burn time is 15.0 - 2.5 = 12.5 sec

Grade 5, 15.0 sec

Fig.11. Burning in

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. The safelight switches off, and 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
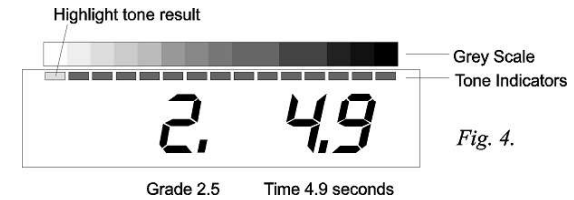

Highlight tone result
Grey Scale
Tone Indicators

2. 4.9

Fig. 4.

Grade 2.5   Time 4.9 seconds

READING AND THE SAFELIGHT HAS BEEN SWITCHED BACK ON! 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)
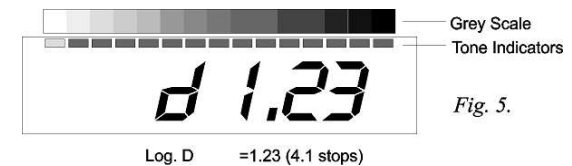

Grey Scale
Tone Indicators

d 1.23

Fig. 5.

Log. D   =1.23 (4.1 stops)

Tone placements for two measurements
Grey Scale
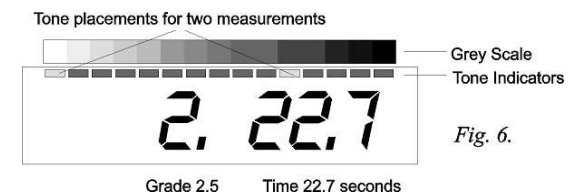Tone Indicators

2. 22.7

Fig. 6.

Grade 2.5   Time 22.7 seconds

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).

3   Press ✹ to switch off the enlarger, and switch the safelight 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
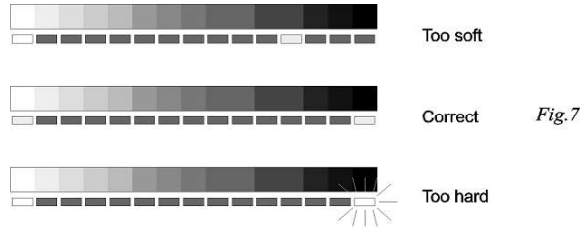
Fig.7

a grey tone, this indicates that the contrast range of the negative is smaller than that of the paper. Press ◁▶ 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).

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 ▷◀ 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 Analyser 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 Analyser'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, and press ☉. The enlarger will be switched on for the indicated time, and the display will count down to zero. The grade digit shows "P" to indicate a Print exposure is in progress.

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.

Too light   Correct   Too Dark
Fig.8.

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 Mulitgrade 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 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 Analyser 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.

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 x 4 = -8).

6 The correction factors are entered into the Analyser's calibration memory as follows:

7 Press ✦ 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 00, and the time display shows the correction factor, currently zero.

8 Set the grade for which you have a correction factor, using the ◁▶ and ▷◁ buttons. Now use the ▲ and ▽ buttons to adjust the time display so that is 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 Analyser 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.

10 When you've entered your correction factor(s), press ✹. The display will show "cont" and then finally "o 179" or similar. Press ✹ 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 Analyser 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

8. Print too light or too dark

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

1 This is easily corrected by making a test strip to determine the correct exposure.

2 Set your Analyser'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 Analyser's settings, press ✹ again to switch on the enlarger. Press ⏱ to enter test-strip mode (refer to section 5.4); the enlarger will be switched off again.

4 Place a piece of paper in the easel, and press ⏱ to expose the whole of the paper for the indicated time. The grade digit shows "t" to indicate a test strip sequence. Cover a strip of paper (about 1/7th) and press ⏱ again. Repeat this sequence, progressively covering the paper, for the complete test strip sequence of seven exposures (Fig.9).

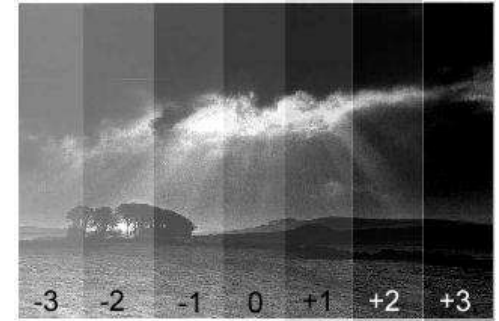*Fig.9*

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 Analyser's calculations. If it is one strip to the lighter side, that means one step less than calculated. The number of steps 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 Analyser'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 ▲ 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 Analyser'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.

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 Analyser's measurements so that future prints at that setting will be correctly exposed - see section 11.

5 You can continue to use your Analyser 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 Analyser's calculations will in future be correct without manual intervention. See section 10, Exposure Correction.

9. Print too soft or too hard

Too Hard   Correct   Too Soft
Fig.10.

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 Analyser!

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.

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 Analyser, or you can adjust the Analyser'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.

10. Exposure Correction

1 If your prints are consistently dark or light you will want to correct your Analyser'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" booklet is the best way to do this; however while you are learning to use your Analyser 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.