



# StopClock

## The f-Stop Enlarger Timer

### Instructions for use

Dual-channel versions



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## CONTENTS OF THE PACKAGE

The StopClock package contains the following items: the timer itself, a mains lead fitted with a plug, two IEC connectors for your enlarger and safelight, and a footswitch. 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 StopClock.

**WARNING: THIS APPLIANCE MUST BE EARTHED**

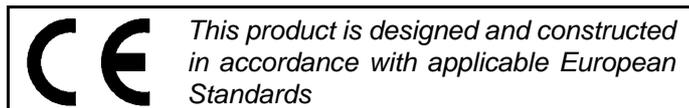
The mains lead supplied with the unit is fitted with a moulded plug suitable for use with the standard mains outlets in your country. If the lead is not suitable, obtain a replacement. If this is not possible, the plug must be cut off leaving as little free lead as possible *and disposed of immediately*. 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 T5A.) 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, StopClock 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.

***This unit is designed to control photographic enlargers and safelights only. Connection of any other type of equipment to this unit may present a safety hazard and will invalidate all warranties.***

### 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, call RH Designs with a description of the fault. If the problem cannot be solved over the telephone we will repair or replace the equipment (at our option) 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 of the equipment are not covered by this guarantee.





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## Introduction

Thank you for choosing the StopClock, the f-Stop Enlarger Timer designed *by* photographers *for* photographers. Once you have mastered StopClock and the f-stop method, making prints will be easier and more successful and you will almost certainly save time and paper. This booklet covers only the rudiments of f-stop printing; if you are new to the method it will be well worth your while investing in one or more of the excellent books available on the subject. A short bibliography appears at the end of this booklet.

This first section is designed to familiarise you with StopClock's basics prior to connecting up your enlarger and safelight. Spend as much time as you need trying out the timer before attempting to make your first print. If you are familiar with StopClock's concept and operation when you start printing with it, your chances of early success are much improved!

Fundamental to StopClock's operation, in addition to the f-stop method, is its programmability. To get the best from it, you should try to pre visualise the end result you wish to achieve (StopClock's automatic test strip feature makes this easy) and enter all the necessary burning-in exposures into StopClock's memories before exposing any of the print. This way, you will not need to remember or work out any exposure times, or adjust the timer in any way, from the base exposure right the way through to the finished print. Your thinking can be done with the lights on, and then all you need to remember is the order in which you programmed the sequence so that you can mask the appropriate areas of the print during each exposure step. StopClock remembers the sequence until you change it, so several identical copies of a complex print can easily be reproduced.

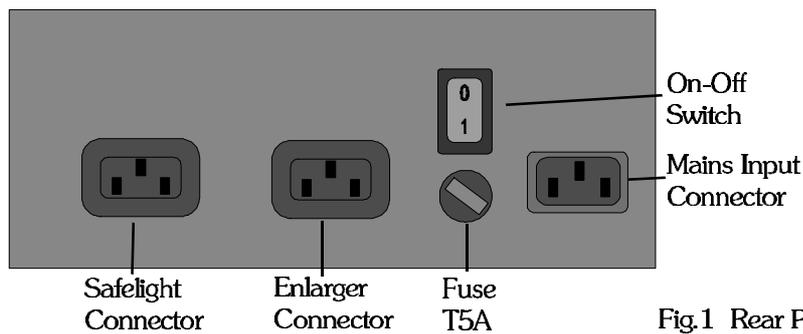
(If you are uncomfortable with the concept of "programming", don't worry; StopClock is much easier to program than a video recorder! Practice on a negative which requires a minimum of manipulation, for example a landscape in which just the sky needs burning in. Such a negative might need just a base exposure followed by one burning in exposure. To make the print with StopClock, you set the base exposure time and then enter the burning-in time (in f-stops) into memory step 1. Set up and focus your negative. Place the paper on the enlarger baseboard; press the footswitch to make the base exposure; mask the land area of the image and press the footswitch again to burn in the sky. That's all there is to it!)

## Basic Operation

StopClock is supplied with a mains lead fitted with a moulded plug suitable for your local mains outlets. See the **Caution** on page 2 if this lead is not suitable.



Plug the lead into the receptacle at the rear of the timer (fig.1) and into a suitable mains socket. (**Warning! Check that your StopClock's mains voltage setting matches your local power supply!**) Don't connect anything to StopClock's output sockets yet. Turn the mains switch on by pressing in the lower edge (marked '1'). The display lights up, and after a short test period shows the figures



**10.0** signifying 10.0 seconds. If the display does not come on, check the mains supply, and try the lead on another appliance. If it is OK, check the fuse fitted on StopClock's back panel and replace if necessary (fuse type T5A). If the fuse is intact, or it blows again, return the unit for service. **DO NOT** fit a larger fuse as this will compromise safety and may present a risk of fire.

## The Keypad and Display

The layout of the top panel is shown in fig.2, and comprises two sections: the keypad which controls all operations and the display which indicates the status of the unit. The right hand three digits of the display show the time in seconds and are also used for messages; the left hand digit indicates the exposure step number. To the left of this are two indicators for real time mode and additive exposure.

There are eight control keys. The large key is the **Start/Stop** key, used to start an exposure (and to abort an exposure which has already started). It includes an indicator which lights when StopClock is ready to start an exposure. Next to this is the **Focus** key, which switches the enlarger on and off manually for focusing and image composition; the indicator in this key illuminates when the enlarger is on. The right hand group of four keys are used to set the exposure time. The remaining two keys, **Store** and **Func**, have special functions which we will look at more closely later on. (**Store** is used to enter burning-in exposures into StopClock's memory, and **Func** normally provides access to StopClock's secondary key functions; these are labelled in italic script below the main function of each key.)

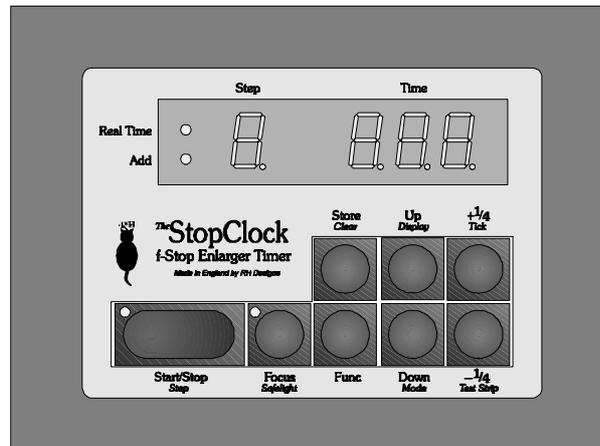


Fig.2 Keypad and Display

### The Footswitch

The footswitch plugs into the socket on the front of the timer and exactly duplicates the functions of the **Start/Stop** key. It is very useful when making complex prints as it keeps your hands free for manipulating masks etc.

### Setting the Exposure Time

To change the exposure time from the initial 10.0 seconds, press **Up** to increase the time, or **Down** to decrease it. Both these keys have “auto repeat”, which means that if you keep them pressed the time will change continuously, slowly at first and then more quickly. The time changes in steps of 0.1 seconds below 25.5 seconds, and then in steps of 1 second between 26 seconds and the maximum of 255 seconds. The minimum time that can be set is 0.5 seconds. The exposure time can also be changed in intervals of a quarter stop by pressing  $+1/4$  and  $-1/4$ . For example, 10 seconds plus a quarter stop becomes 11.9 seconds. These keys do not have auto repeat.

Notice that at present, the memory step indicator is blank, which means that no memories have been programmed. The time shown on the display is called *Base Exposure*. Any subsequent burning in exposures that you enter into StopClock’s memories are calculated from this Base Exposure time. Pressing **Start/Stop** now will start the exposure interval. Press the key and watch the display count up from zero to the Base Exposure time. (You will hear the control relays click at the beginning and end of the exposure, and a beep at the end.) To stop an exposure before the time interval is completed, press **Start/Stop** again.

We recommend that before installing your StopClock in your darkroom, you



work through the remainder of these instructions to get the feel of how the unit operates, but if you are keen to produce your first print refer to the installation guide at the end of this booklet now for help with connecting your enlarger and safelight.

## Basic Printing

### Focusing and Manual Exposure

Prior to making a print you will want to switch on the enlarger manually in order to compose and focus the image. To do this, press **Focus** once. The enlarger is switched on and the Focus indicator illuminates. The safelight is switched off whilst the enlarger is on. When you are happy with focus and composition, press **Focus** again to switch the enlarger off.

### Making a Test Strip

StopClock can automatically time test strips with quarter stop intervals starting at the base exposure. Set the desired shortest exposure time using the time set keys. Now, press **Func** followed by **Test Strip**. This automatically sets up StopClock's memories for the test strip. Notice that the memory digit now displays 0, signifying that a program has been entered and that StopClock is ready to time the Base Exposure. Place a piece of paper on the enlarger baseboard and press **Start/Stop** to make the base exposure. At the end of the exposure, the enlarger is switched off, the memory digit shows '1' to signify program step 1, and the time display shows the duration of the step (if base exposure is 10 seconds, step 1 will be 1.9 seconds, a quarter stop increase). Cover a strip of paper in the usual way and press **Start/Stop** again. StopClock gives the paper an additional quarter stop of exposure. Cover the next strip and press **Start/Stop** again, and so on. You can expose up to ten strips on the same piece of paper. If you don't want ten strips, press **Func** after the last required strip has been exposed, and StopClock resets to Base Exposure. Process your paper and you should have a number of stripes which get progressively darker as the exposure was increased. Notice that the increase of density between each strip is the same because the increase of exposure was a quarter stop in each case. A test strip of say 5, 10, 15, 20 seconds does not give consistent density changes. This is one of the fundamental advantages of f-stop printing! If your strip is all too dark or too light, change the base exposure and repeat. When you are happy with your test strip, press **Func** followed by **Clear** to clear Test Strip mode.

### Making a Straight Print

From your test strip, decide on the optimum exposure for a complete straight print. Suppose that the third strip looks to be the correct one. Make sure you have



cancelled Test Strip mode - the memory digit should be blank - if not press **Func** followed by **Clear**. (If you didn't complete all 10 test strip exposures press **Func** to reset to base, then press **Func** again followed by **Clear**.) The third strip on your test strip represents an increase of two quarter stops over the Base Exposure, so press  $+1/4$  twice. StopClock adds the two quarter stops to the Base Exposure. Place a new piece of paper on the baseboard and press **Start/Stop** to expose it. Process the paper and you will have a straight print exposed correctly according to the selected area of your test strip. The ease with which test strips can be made and exposures subsequently chosen for the complete print is one of StopClock's great advantages.

### Burning In

Suppose the print on which you are working requires extra exposure in one particular area, such as the sky area of a landscape. From your test strip, choose the strip that best renders the area. Suppose for example that two extra exposure steps are needed, i.e. half a stop extra. This additional exposure is then entered into StopClock's memory so that it can be correctly added after the print has received the Base Exposure. Set up StopClock as follows:

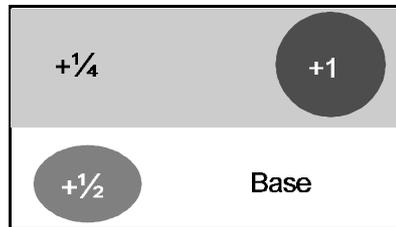
Press **Store**. The display shows **1. PR5**. (The decimal point next to the memory digit illuminates to indicate that you are setting up a program.) Press  $+1/4$  twice; this sets memory step 1 to half a stop. Press **Func** to exit from programming mode. The display reverts to showing Base Exposure, and the memory digit shows '0'. Place a new piece of paper on the enlarger baseboard, and press **Start/Stop** to time the base exposure. Position a mask, or use your hands, to cover the area of the print which does *not* require the extra exposure, and press **Start/Stop** again. The half-stop burn-in is automatically timed. Process your paper for a perfect print! After timing the burn-in exposure, StopClock resets to Base Exposure. Another identical print can subsequently be made simply by pressing **Start/Stop** twice as before. The program will be remembered until it is cleared (press **Func** followed by **Clear**) or the unit is switched off.

## Complex Printing Sequences

### Multiple Burn-in Exposures

StopClock is capable of timing up to ten exposure steps in any one sequence, with or without pauses between them. In addition, it is possible to calculate burn-in exposures relative either to the Base Exposure (for separate areas of the print) or to the total exposure so far (for additional burn-in to part of an area which has already been burned in). This is best illustrated by an example.

Suppose you are printing a negative which requires three areas to be burned in. Area 1 requires a quarter stop extra, area 2 is a part of area 1 and requires 1 stop extra, and area 3 is a separate part of the print requiring an extra half stop.



1. Set the desired Base Exposure as usual.
2. Press **Store**, and set Step 1 to a quarter stop by pressing  $+1/4$  once.
3. Press **Store** again to advance to Step 2.  
Press  $+1/4$  three times to set Step 2 to  $+3/4$  stops. (At the end of Step 1, area 2 will have already had an extra quarter stop, leaving three quarters still required.)
4. The  $+3/4$  stops must be calculated on the total exposure so far, not on the Base Exposure alone. Press **Focus**; this tells StopClock to calculate Step 2 based on the sum of Base + Step 1. The 'Add' indicator lights.
5. Press **Start/Stop**; this tells StopClock that you do not want to pause between steps 1 and 2.
6. Press **Store** to advance to Step 3.
7. Press  $+1/4$  twice to set Step 3 to half a stop.
8. Press **Func** to end the programming sequence.

To make the print, press **Start/Stop** to time the Base Exposure. Then mask off all but area 1 and press **Start/Stop** again. Step 2 follows on without a pause, so when the Beep indicates the end of Step 1 cover all but area 2. When Step 2 is finished, the enlarger is switched off. Mask off all but area 3 and press **Start/Stop** again to make the final exposure.

If you are new to f-stop printing, this might seem complicated, but just remember that if you are burning in an area that has already received some extra exposure, when entering the program you must press **Focus** to calculate the exposure correctly.

With a little practice, programming complex exposure sequences like this example will become second nature to you. You no longer need to keep a sequence of times in your mind whilst printing, or adjust the timer between exposures, leaving you free to concentrate on accurate masking. Setting up StopClock in advance of making the print forces you to plan ahead; this way there is less margin for error during exposure. In conjunction with the easy-to-use Test Strip mode, these features can and will save you lots of paper and time. Also, remember that when you want to print the same negative on a different paper or at a different size, all you need to do is change the Base Exposure. StopClock will recalculate all the remaining exposures for you *automatically!*



## Other Features and Facilities

### Clearing and Editing a Program

To clear a program completely, leaving just the Base Exposure, press **Func** followed by **Clear**.

To change a program step, press **Store** as necessary to advance to the step to be changed. Press  $+1/4$  or  $-1/4$  to change the time. You can also press **Start/Stop** or **Focus** to change the operating mode of a step. More than one step can be changed, just press **Store** again to advance to the next step. Steps can be added to the end of a program in this way as well. When you have made all your changes, press **Func** to exit programming mode. *Note:* when a step is changed, any steps which are calculated relative to it (i.e. if you have pressed **Focus** in any subsequent step) will be recalculated to reflect the change.

If you find that the ideal exposure lies between two quarter stop steps (for example if you are using a hard paper grade), it is possible to “fine tune” each exposure step. Refer to “Real Time Mode” for information on how to do this.

### Changing Channels

StopClock has two completely independent timing channels, each with its own base exposure, nine burn-in memories, and operating modes. You can for example use one channel in f-Stop Mode and the other in Real Time Mode, or keep a test strip sequence in one channel while using the other for the actual exposure. The use of two channels is ideal for “split-grade printing” on variable contrast paper, where one exposure sequence is made at a soft grade, for the highlights, and another at a hard grade to print in the shadows.

To change channels, StopClock must be at Base Exposure (i.e. with **0** showing on the memory step indicator). Press and hold the **Start/Stop** key or the footswitch for approximately one second. StopClock will beep, and **CH1** or **CH2** will appear on the display briefly. You will hear one beep on changing to channel 1, and two beeps on changing to channel 2.

You can set different default (switch-on) preferences for each channel too.

### More than nine burn-in exposures on any one channel

Should you need more than nine burn-in exposures on any one timing channel, you will have to use two or more program sequences. First, enter the first sequence and expose the paper. Then, clear the program and enter the second sequence. You must then bypass the base exposure (since you don't want to repeat it!). To do this press **Func** followed by **Burn**. This will advance to step 1 without turning on the enlarger. Then press **Start/Stop** to start the new sequence.



## Aborting an exposure or sequence of exposures

To switch off the enlarger before a time step has finished, press **Start/Stop**. The enlarger is switched off and StopClock is ready to start timing the next step. If you get part way through a sequence of exposures and then want to abandon it, press **Func**. StopClock reverts to Base Exposure, and the program remains in memory.

## Dodging

We recommend that you regard dodging as a reduction in Base Exposure followed by a burn-in of all areas of the print *except* those to be dodged. It is much less confusing to do this than to attempt to subtract time from the Base Exposure. Set the Base Exposure to the minimum required on the print, and regard all other exposures as additional burn-ins. StopClock's test strip mode assumes this method; all exposures are additional to the Base Exposure.

## Custom Test Strips

Whilst StopClock normally exposes test strips with quarter stop increments, it is possible to change this default and produce test strips with intervals of between one quarter stop and two stops. Clear any program that is in memory, and then set step 1 to the required increment (e.g. half a stop). If you don't want the enlarger to be switched off between exposures, press **Start/Stop**. Press **Func** to exit programming mode, then press **Func** again followed by **Test Strip** to set up the test strip. Strips with large increments and/or with a long base exposure may result in an error message - see the next section.

## If an error occurs...

The maximum length of any one time step is 255 seconds. It is possible, when setting up a program or test strip sequence where the base exposure and the subsequent steps are long, for this maximum to be exceeded. For example, a one-stop test strip based on ten seconds requires that step 6 be 320 seconds. An attempt to set such a sequence results in the display showing **ERR**, indicating that step 6 is in error. Step 6 and any subsequent steps will be cleared to zero. However, the sequence will be set up and will operate correctly up to and including step 5.

## Seconds tick

StopClock always sounds a short beep at the end of a time step. In addition, a tick may be programmed to sound each second whilst the enlarger is switched on (including during manual operation). To switch on the tick, press **Func** followed by **Tick**. To switch it off again, use the same key sequence. The display momentarily shows **ON** or **OFF** as appropriate.



## Safelight Switching

The safelight will normally be switched off whenever the enlarger is switched on (auto mode). It can also be switched permanently on or off. To cycle between modes, press **Func** followed by *Safelight*, once or twice if necessary, until the display shows **ON**, **OFF** or **AUT** as required. **Note:** Sodium safelights (e.g. the Duka 50) are not suitable for use with StopClock because they must not be repeatedly switched on and off.

## Display mode during timing

StopClock's display normally counts up from zero during timing, but if you prefer it can be set to count down instead. Press **Func** followed by *Display* to toggle between up and down. The display shows **INC** (increment - up) or **DEC** (decrement - down) as appropriate. StopClock has a sensor which automatically adjusts the brightness of the display according to the ambient lighting, and it will not fog paper under normal conditions provided that the paper is not directly exposed to it. Keep colour papers away from the display as much as possible to minimise the risk of fogging.

## Real Time Mode

In Real Time Mode, StopClock acts like a conventional timer and all exposures are expressed and entered in seconds. There is no automatic recalculation of steps when program steps are edited since there is no f-stop relationship between the steps. Operation is similar to f-stop mode, except that steps are set up using **Up** and **Down** instead of  $+1/4$  and  $-1/4$ .

To select Real Time Mode, press **Func** followed by *Mode*. The Real Time indicator illuminates. To switch back to f-Stop Mode, again press **Func** followed by *Mode*.

**Note:** When switching between modes, program steps are not cleared. Hence, Real Time Mode can be used for making fine adjustments to a sequence originally set up using f-Stop Mode (handy when using hard paper grades when a quarter stop adjustment might be too coarse). However, switching back to f-Stop Mode will restore the original times and lose the adjustments.

For example, if you adjudge a quarter stop burn-in to be too little, and half a stop to be too much, set the program step to  $+1/4$ . Exit programming mode and switch to Real Time. Press **Store** to advance to the step in question, and then use **Up** and **Down** to adjust the time. Exit programming mode again and make the print. Do *not* switch back to f-Stop Mode or you will lose your adjustments.

If a program has been entered from scratch in Real Time Mode, switching modes will clear it. *Setting up a test strip in Real Time Mode will switch StopClock to f-Stop Mode.*



## Setting Your Preferences

The initial settings that StopClock adopts at switch on (i.e. the Base Exposure of 10 seconds, the display mode, tick etc) can all be modified to reflect your preferences. Once changed, StopClock will remember them and set them automatically each time you switch on. For example, you may prefer a default Base Exposure of 15 seconds, and the display to count down instead of up.

To change the settings, switch the unit off and wait ten seconds. Press and hold the **Start/Stop** key and switch the unit on. Instead of showing the usual **S. 000**, the display will show **P - - -** and you will hear three short beeps. Now, set the desired time and modes in the usual way. If you want to set up a preferred Test Strip interval (to be used instead of the standard quarter stop), set up program step 1 and set **Test Strip** in the usual way. When you have set all your preferences, press **Start/Stop**, and StopClock will reset and re-initialise according to the settings you just entered. You can change your preferred settings at any time by repeating the above procedure.

## Volatge Stabiliser Delays

Some voltage stabilisers, notably certain Durst and Kaiser models, exhibit a delay of about 0.5 seconds at switch on. StopClock can allow for this and wait 0.5 seconds before commencing the timing sequence. When setting preferences, pressing **Focus** will toggle this delay on or off. The display will indicate the new status of the delay.

## Restoring the Factory Settings

If you wish to restore all the default preferences to those pre-set at the factory, follow the procedure for entering the preferences as above, then press **Func** followed by **Start/Stop**. This will restore the pre-set values for *both* channels. On rare occasions it is possible for StopClock's preferences memory to become corrupted; should this occur, restoring the defaults will restore normal operation. You can then re-enter your own preferences if desired.

## Bibliography

The following books contain useful information about the f-Stop Method of printing. The list is by no means exhaustive, nor is it any order of preference.

Nocon, Gene: "*Photographic Printing*". 2nd edition, Virgin

Ephraums, Eddie: "*Creative Elements*". 21st Century

Rudman, Tim: "*The Photographer's Master Printing Course*". Mitchell Beazley / 'Amateur Photographer'.



# Summary of Key Operations

## Main Functions

### Start/Stop (or footswitch)

1. Starts an exposure.
2. Press during an exposure to stop the exposure.
3. Press during programming to delete the pause between exposure steps.
4. Press and hold for 1 second + to change timing channels

### Focus

1. Switches on the enlarger manually for focussing etc.
2. Press once more to switch off the enlarger.
3. Press during programming to calculate a burn-in time from the total exposure rather than the Base Exposure alone.
4. Press during preferences setting to toggle the stabiliser delay on and off.

### Store

Advances to the first or subsequent program step for programming or editing.

### Func

1. Selects the alternate functions of the remaining keys (those labelled in *italics*).
2. Exits programming mode.
3. If pressed before a programmed sequence has been completed, resets to Base Exposure.

### Up

Increases the displayed time by 0.1 seconds (1 second above 25.5 seconds). No effect during setting up of a program in f-Stop Mode.

### Down

Decreases the displayed time by 0.1 seconds (1 second above 25.5 seconds). No effect during setting up of a program in f-Stop Mode.

### + $\frac{1}{4}$

Increases the displayed time by one quarter stop. No effect during setting up of a program in Real Time Mode.

### - $\frac{1}{4}$

Decreases the displayed time by one quarter stop. No effect during setting up of a program in Real Time Mode.



## Secondary Functions

**Burn** (= Func + Start/Stop)

Skips the Base Exposure and advances the program to step 1. Used when more burn-in exposures are necessary than one program sequence can handle.

**Safelight** (= Func + Focus)

Changes the safelight switching mode between 'on when the enlarger is off' (auto), 'always off' and 'always on'.

**Clear** (= Func + Store)

Clears the program memories. (Has no effect on the Base Exposure time)

**Display** (= Func + Up)

Switches the display between count-up and count-down modes.

**Mode** (= Func + Down)

Switches operation between Real Time and f-Stop Modes.

**Tick** (= Func + +1/4)

Switches the seconds tick on and off.

**Test Strip** (= Func + -1/4)

Sets up a Test Strip based on the contents of memory step 1. (If step 1 is clear, sets a 1/4 stop test strip, or your preferred setting - see "Setting your Preferences").

## Problem?

If you have a query not answered by this manual just contact us and we'll be pleased to help.

There are two problems that may occasionally arise in normal use. If the Start/Stop key sticks down, this is a result of the little LED going out of centre, usually caused by a knock which may have occurred in transit. Press the button down firmly and "wobble" it to re-centre the LED - this should cure the problem. Secondly, if the StopClock appears to be misbehaving, the preferences memory may have become corrupted. To restore it, follow the instructions on page 13 - "Restoring the Factory Settings". This will normally restore normal behaviour. If you think that your StopClock has developed a fault, please call us before returning it for service because most apparent problems can usually be sorted over the telephone.



## Installation Guide

**CAUTION:** Like other electronic equipment, StopClock 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. **Dual Voltage models: to prevent damage, ensure the voltage selector switch on the bottom of the unit is set correctly for your mains voltage.**

### Conventional Enlargers

StopClock 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 StopClock 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 StopClock; the timer's internal relays can cope with the high switch-on currents and voltage spikes generated 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

Most voltage stabilisers are suitable for use with StopClock. The DeVere Transtab unit has connections for a timer; we can supply a ready made lead or alternatively a data sheet is available from us giving connection details. If you are in doubt, consult the manufacturer of your stabiliser, or RH Designs direct. Durst and Kaiser users - see page 13.

## Connecting Your Enlarger and Safelight

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

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 StopClock. A wiring diagram is shown in fig.4. 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 StopClock. 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 Safelight socket at the back of the StopClock. NOTE: Sodium safelights such as the Duka 50 must NOT be connected to the timer as they must be left switched on.

### Checking the Installation

When you have completed the wiring, plug the StopClock's mains lead into a convenient socket and switch on. The safelight (if connected) should illuminate as soon as StopClock finishes its initialisation sequence (after about one second). 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 safelight should now be extinguished and the enlarger bulb illuminated. Again, if it is 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. If you need any more help or information, contact RH Designs on 01442864114 (office hours) or 01442 244907 (other times - this is a domestic number; please respect that!). An answering service is available if we cannot take your call immediately. We can also answer questions by fax (01442 864114) or e-mail ([rhdesign@nildram.co.uk](mailto:rhdesign@nildram.co.uk)).

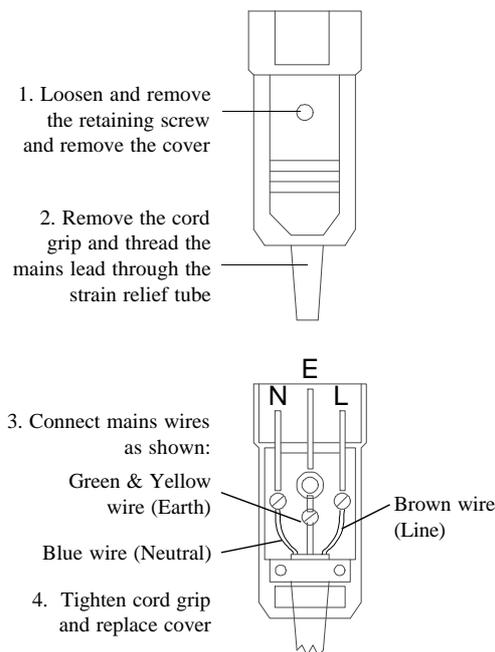


Fig.4 Connector Wiring Diagram



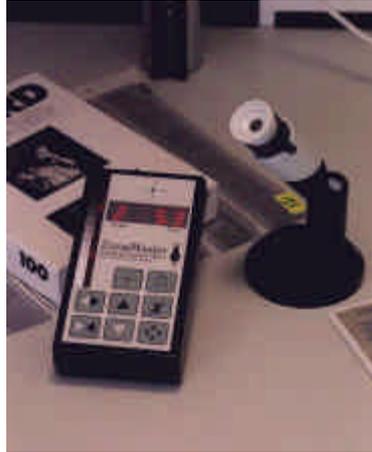
## The "ZoneMeter"

### Enlarging Exposure and Contrast Indicator with Paper Grade Scale

The ZoneMeter is an inexpensive exposure meter designed to assist photographic printing by indicating a suggested exposure. In addition it will suggest an appropriate grade for black and white papers according to negative contrast. Comprising a light sensitive cell together with a logarithmic bargraph type LED meter, it can read the light level falling on the enlarger baseboard over a range of five stops. There are no dials to adjust in use, and a very simple calibration process assures accurate and repeatable measurements. The ZoneMeter is factory set to give an exposure time of around ten seconds when using most variable contrast black and white papers. This time can be adjusted to suit your own materials and methods. The ZoneMeter can also be used for colour printing and will provide an indication of negative (or transparency) contrast in addition to a suggested exposure.

#### Features

- κ Spot metering together with a logarithmic scale provides reliable, predictable results.
- κ Half stop resolution.
- κ Five-stop measurement range.
- κ No dials to adjust during use, just set the lens aperture according to the bargraph scale's indications.
- κ Easy to use for black and white and colour printing.
- κ Adjustable calibration caters for your preferences of paper, processing, and enlarger characteristics.
- κ Provides an easy method of determining burn-in times, especially in conjunction with our StopClock f-Stop Enlarger Timer.
- κ Single PP3 type battery (included) provides long life and is easily replaceable. Rechargeable types can be used.
- κ Full two year guarantee, plus 14 day refund if you are not completely satisfied.



## The "ZoneMaster" Black & White Enlarging Meter with Grey Scale Print Tone Indicator

The ZoneMaster enables a black and white print to be made quickly and easily from almost any negative. This is achieved simply by using a built-in light sensor to spot meter the important areas of the image projected on the enlarger baseboard. The ZoneMaster then displays the measurements on a grey scale (patent pending), indicating the tones which will appear on the print. You can adjust the contrast (paper grade) and brightness of the print using the grey scale indicator to preview the tonal range. As adjustments are made the ZoneMaster calculates the required exposure time to make a print with the desired range of tones. Simply set your enlarger timer and filtration to the ZoneMaster's indications. The ZoneMaster is supplied ready calibrated for Ilford® Multigrade® paper so you can be up and running with a minimum of preparation; however a simple calibration procedure allows the ZoneMaster to be optimised for your own enlarger's characteristics and your preferences of materials and processes.

### Features

- ⌘ Up to eight spot readings of a negative can be taken and the corresponding tonal value of each on the final print will be displayed on the 15 step grey scale. Densitometric readings can also be displayed.
- ⌘ Simple controls (harder, softer, brighter, darker) allow print contrast and brightness to be previewed without the use of test strips or prints - saves time and paper. Over and under exposure warnings. 9-stop measurement range.
- ⌘ Exposure times of 1.5 to 97 seconds are calculated automatically by the ZoneMaster using its light sensor in conjunction with paper grade and built-in calibration settings. Exposure times can be adjusted manually and the effects on the resulting print will be displayed on the grey scale. Simply set your enlarger's timer to the time indicated by the ZoneMaster.
- ⌘ Adjustable calibration caters for your preferences of paper, processing, and enlarger characteristics for every grade of paper from 00 to 5, including half-grades.
- ⌘ Automatic test strip generation for fine tuning of print exposure - set your timer to the times displayed on ZoneMaster.
- ⌘ Simple calculation of split-filter exposures for burning in difficult areas on a print.
- ⌘ Audible indication of exposure time for use with a manual enlarger switch if a timer is not used.
- ⌘ Splash proof case with touch sensitive controls for durability. Powered by 4 easily obtainable AAA batteries.

