A Guide to Using the Durst AC800 for Black and White Printing

Revision 1.2 . August 22, 2013

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Introduction

The robotic Durst AC800 model film enlargers were produced in Italy by the German manufacturer just before fully automated mini-labs displaced human-operated enlargers in the commercial processing of colour film. The chemical-based mini-lab technology was itself disrupted by digital capture and printing and Durst eventual quit making enlargers altogether and went out of business.

The Durst AC800AF - earlier versions were called the AC800 Elite - cost about $15,000 when new in the late 1980s and early 1990s. The AC800AF may well have been the world's most expensive darkroom enlarger. It was drastically devalued when mini-labs and then digital technologies upended commercial image processing as the millennium turned. Most were discarded. Others were sold to film enthusiasts for a small fraction of their original value.

There is also a Durst AC800 without auto-focus. This guide applies to that manual-focus model as well but only with respect to auto-exposure calibration. For simplicity, this guide refers throughout to the AC800AF.

The superiority of digital technology for colour printing is beyond dispute. With the disappearance of colour chemistry and paper, the AC800AF is useless for its main intended purpose - high-volume commercial printing of colour film negatives . However, the precise auto-focus and auto-exposure features of the physically imposing apparatus (it weighs 40kg, or 88 pounds) can be tuned for efficient and semi-automated black-and-white printing.

The image projected on the baseboard easel can be re-sized without making the iterative adjustments to focus and magnification inherent in composing with a manual enlarger: Change the magnification and the focus follows automatically.

Nor is it necessary to estimate and adjust exposure time to compensate for changes in magnification. You can swap multigrade filters to change print contrast without manually compensating exposure. Once trained, the AC800AF makes the exposure compensation for each filter grade.

Finally, the design and quality of the AC800AF represents the peak of industrial enlarger engineering, with precisely machined interchangeable negative masks and light-mixing boxes for 35mm and three medium-form at negative sizes. There is definite tactile pleasure in manipulating the AC800AF's components, especially the hefty negative carrier.

The biggest impediment to continuing use of the AC800AF is the dismal quality of the original user documentation. An enigma machine would help in deciphering the terrible technical translation. Even when decoded, the step-by-step instructions are confusing. Without documentation, the machine is an inscrutable array of buttons and digital displays.

The purpose of this document is to set out procedures for the physical configuration and digital calibration of the AC800AF for highly-efficient, paper-saving, black-and-white print production. I hope this will help to save some of the remaining AC800AFs from the landfill and to stimulate formation of a global coterie of new users supported by a living knowledge base.

I hope, with this guide, to attract the attention of other users who will contribute their own insights and techniques to the AC800AF knowledge base. I welcome suggestions for corrections or additions to this document and will update it with the new knowledge.

This document lives at www.canadaprintandframe.ca where it will be updated as corrections, additions and insights are contributed by AC800AF users.

The procedures in this guide were developed through interpretation of two of the original Durst manuals (one early edition for the AC800 Elite and a later revision for the AC800AF published in 1996 at the end of the product's lifecycle).

In the interest of a smoother, more intuitive workflow for black-and-white artisans, the AC800AF's colour-specific functions are ignored, including automatic detection of and exposure compensation for unusually dark or light negatives and paper reciprocity corrections for very large prints. In black-and-white mode, the AC800AF uses its basic exposure calibration to handle dark and light negatives. Paper reciprocity failure is not an issue for black-and-white printing because the AC800AF is capable of changing light intensity as well as exposure time, without changing lens aperture.

The AC800AF was offered with an optional wired remote control. While undoubtedly useful for entering one-shot colour corrections on the fly, it is superfluous to black-and-white production and can be unplugged and set aside if counter space is tight.

The practical objective of this guide is to prescribe steps in hardware configuration, firmware calibration and production workflow that will produce well- exposed and perfectly focused, proof-quality images at the first attempt. Creative adjustments for lighter or darker prints can specified manually via the AC800AF's array of buttons and keys..

The most paper-saving workflow would be to make the initial, fully automated exposures on one-shot test strips that can be used as a reference for minor, manually entered adjustments for subsequent full-size prints. Pulling and pushing print development by varying times in the developer is a sloppy practice that produces inconsistent print quality. Adjust your exposures so that the paper is fully developed, but not more.

The AC800AF must be trained by the operator for auto-focus and auto-exposure.

Section 1: Autofocus Training

The Durst AC800AF must be trained to focus throughout its magnification range. The auto-focus mechanism itself is mechanical, driven by a threaded rod that raises and lowers the negative carrier according to the enlarger head's elevation on the AC800AF's sturdy vertical column. The correlations of head elevation and focus must be programmed to the machine's battery-dependent memory. To maintain the battery charge, you may wish to keep the AC800AF plugged in to a surge-protected outlet, but powered off, when not in use. (This advice is based on the unsupported assumption that the AC800AF power supply maintains the battery charge as long as it is plugged in. Shared experiences with maintaining and eventually replacing the internal battery would be most welcome.)

Auto-focus programming is specific to each of the three common lens sizes that may be mounted in the AC800AF. Thus, focus training must be repeated for each lens size to be used.

The three lens sizes are:

50mm for 35mm film
80mm for 6cm square medium format film
105mm for 6cm by 9cm medium format film

There are separate lens mounting boards for 50mm lenses and for 80mm or 105mm lenses. The 50mm lens must be mounted in the Durst Setopla 2839 lens board. The 80mm and 105mm lenses must be mounted in the Lapla 39 lens board. Both lens boards accept the standard 39mm threaded mount common to most enlargers.

Similarly, there are one standard and two optional light-mixing boxes which may be (but don't have to be) paired with the lenses and lens boards.

The provided mixing box is the AC800 69 for use with all negative sizes up to 6cm x 9cm.

Optional mixing boxes are the AC800 66 optimized for square medium format negatives and the AC800 35 optimized for 35mm negatives.

In addition, the Durst Cobineg film carrier is provided with a top anti-Newton ring glass and a bottom mask for medium format negatives up to 6cm by 7cm. Optional negative masks (glassless top and bottom) are available for 35mm (Binema 35), for 6cm x 6cm (Binema 66), for 4.5cm x 6cm (Binema 45 or 45H), and even for 110 film (Binema 110). The anti-Newton glass may be substituted for the top half of any of the negative masks but is not necessary for production printing. The glassless negative masks hold the film tight and flat.

Ideally, the 50mm lens and Setopla 2939 lens board should be paired with the AC800 35 light-mixing box and the Binema 35 negative carrier. Similarly, the 80mm lens and Setopla 2839 lens board should be paired with the AC800 66 light-mixing box and the Binema 66 negative mask. However, the supplied AC800 69 mixing box is fine for all negative sizes.

For auto-focus training, the anti-Newton glass should be used in place of the metal top plate of the negative mask. This is to ensure a flat negative for ultra-precision focusing. Such precision is beyond need for general production and the two-piece metal negative masks may be used confidently without the annoyances of dust and scratches inherent in the use of glass negative holders.

The following instructions are for auto-focus training with the 50mm lens for 35mm negatives. Substitute the appropriate hardware configuration for auto-focus training with the 80mm or 105mm lenses.

Step 1: Physical Configuration
Install the anti-Newton glass plate in the top of the negative carrier. Install the 50mm lens in the Setopla 2939 lens board. If available, install the AC800 35 light mixing box.

Place your production enlarging easel on the baseboard. Place a waste sheet of paper in the easel. Place a sharp, grainy negative in the negative carrier, emulsion side down as usual.

Step 2: Clear Previous Settings and Set Lens Size
Power on the AC800AF.

If Error 7 is displayed, the auto-focus memory is blank. Tap **ENTER** to clear the error display.

If the **Foc.Var.III** key LED is illuminated there is a temporary distance offset recorded in auto-focus memory. Hold the key until "d" is displayed. Release the key. Simultaneously press + and • to clear the temporary offsets.

Tap SETUP to display "C. Use + and - to select 50mm lens. Tap **ENTER** to retain this lens choice for auto-focus training. Tap **SETUP** five times to exit setup mode.

Hold **ENTER** and tap **F.Var./III** to display "SFOC" (for Set Focus). Now clear all previous auto-focus memory by simultaneously pressing + and -. Tap **F.Var./III** again to exit.

Step 3: Set Focus at Reference Points

Auto-focus training is performed by manually focusing at specific reference points along the centimetre scale of the AC800AF column.

For 50mm lenses the reference points are: 17, 21, 25, 30, 35,40, 45, 50, 55, 60, 70, 80, 90

For 80mm lenses the reference points are: 17.5, 20.5, 25, 30, 35,40, 45, 50, 55, 60, 65, 70, 80, 90

For 105mm lenses the reference points are: 29, 32, 36,40, 45, 50, 55, 60, 65, 70, 75, 80,90

Move the bottom edge of the enlarger head to the lowest reference point.

Focus the image on the baseboard by toggling **LIGHT** and **W.LIGHT.** Always finish the focus with an upward adjustment **(W.LIGHT)** to take up mechanical slack in the auto-focus mechanism.

Instruct the AC800AF to store the focus setting for that reference point by holding **ENTER** and tapping **EXPOSE.**

Verify the focus, preferably with a focus magnifier. If a sharper focus can be achieved by tapping **LIGHT** and **W.LIGHT** store the fine-tuned focus setting by again holding **ENTER** and tapping **EXPOSE.** If not, proceed to the next auto-focus reference point and repeat the procedure.

Once auto-focus has been trained for all reference points, exit auto-focus training by holding **ENTER** and tapping **F.Var./III.** The indication "SFOC" should extinguish.

Step 4: Retraining for a Single Reference Point

Should focus prove to be imperfect at or near a specific reference point, it can be corrected by moving the enlarger head to the reference point, holding **ENTER** and tapping **F.Var./III.**

Refocus by toggling **LIGHT** and **W.LIGHT.** Store the new focus data by holding **ENTER** and tapping **EXPOSE.** Exit auto-focus training by holding **ENTER** and tapping **F.Var./III.** The indication "SFOC" should extinguish.

Section 2: Auto-exposure Calibration

The following procedures train, or calibrate, the AC800AF to correctly expose normal negatives while automatically compensating for magnification factors. The same negative should be equally exposed no matter what the size of the enlargement.

The AC800AF factors both illumination time and light intensity to calculate exposure. In black-and white-mode, the enlarger's filter set is deployed as a neutral density filter to modify light intensity. Thus, exposure time remains pretty constant, while the intensity of the light changes to achieve the desired exposure. There is no way to use the AC800AF filter set to simulate multigrade filters.

You must use actual multigrade filters, placed under the hinged flap which sits atop the light-mixing box. The metal frame above the diffusion glass is the flap in question. You must remove the mixing box from the enlarger head to access the filter flap, Ilford's 8.9cm (3.5in) square filter set fits perfectly.

The AC800AF uses four variables to calculate exposure:

Lens focal length Lens aperture Negative density Filter grade

Ten separate combinations of lens length, aperture and filter grade may be stored in exposure "channels". The negative density variable is measured at the time of exposure by the densitometer sensors situated beneath the negative carrier.

Thus, a particular channel is trained for a specific combination of lens focal length, lens aperture and multigrade filter. The same standard negative of average density is used to train each channel. For black-and-white printing of same-size negatives, the unique difference of each channel is the grade of the multi-contrast filter.

(At the risk of causing confusion, you could calibrate channels for use without filters and with graded papers instead. Then the paper grade would be the variable that changes from channel to channel. You could also calibrate some channels for use with multigrade filters and others for graded papers.)

A convenient strategy is to train each channel for its corresponding grade of filter. Channel 0 is trained for the 50mm lens, f/8 aperture and filter grade 0. Channel 1 is trained for the same 50mm lens, f/8 aperture but filter grade 1. And so on for as many filter grades as desired. Intermediate grades, such as 2.5, can be included but at the cost of elegantly matching channel numbers to filter grades.

For users of both 35mm and MF negatives, a suggested strategy is to use channels 0-4 for 35mm work with the 50mm lens, and use channels 5-9 for MF work with the 80mm lens.

Thus, for example, channels may be designated as follows.

Channel 0: 50mm lens, f/8 aperture), Multigrade filter 0 Channel 1: 50mm lens, f/8 aperture), Multigrade filter 1 Channel 2: 50mm lens, f/8 aperture), Multigrade filter 2 Channel 3: 50mm lens, f/8 aperture), Multigrade filter 3 Channel 4: 50mm lens, f/8 aperture), Multigrade filter 4 Channel 5: 50mm lens, f/8 aperture), Multigrade filter 5

Channel 6: 80mm lens, f/5.6 aperture), Multigrade filter 1 Channel 7: 80mm lens, f/5.6 aperture), Multigrade filter 2 Channel 8: 80mm lens, f/5.6 aperture), Multigrade filter 3 Channel 9: 80mm lens, f/5.6 aperture), Multigrade filter 4

(Note that in this configuration, Channels 6-9 are designated for medium-format negatives using an 80mm. lens. Because this longer lens requires more more light, the aperture is set to f/5.6. Keeping a single aperture setting for each negative size reduces the risk of incorrect physical settings on the lenses themselves.)

There are limits to AC800AF automation. The operator (you) must ensure that the appropriate lens is in fact installed and that the lens aperture is physically set by means of the ring on the lens itself. AC800AF channels are not electronically linked to the lens or to the filter tray. You do that with your head and your hands. Selecting a channel means ensuring, mentally and manually, that the correct lens is in place, the aperture is correctly set, and the correct filter is in the filter tray. The AC800AF channel configuration is meant to reflect the physical reality of the lens and filter setup, not to change it.

Step 0: Hardware Setup for Black-and-White Printing

This step is for semi-permanent configuration of the AC800AF for black-and-white printing. This should be a one-time operation, unless the enlarger is for some unimaginable reason re-configured for colour work.

Remove the densitometer which is the square unit between the negative carrier and the lens mount. This is easiest done by first removing the lens mount (with lens attached) and the negative carrier. Slide the densitometer mode switch to "B/W". Replace the densitometer, negative carrier and lens mount.

Now, ensure that the AC800AF internal filters are physically set to zero for all three colours. Push up the plastic slide on the right side of the enlarger head. The enlarger lamp will automatically illuminate. Using either the dedicated AC800AF tool (normally parked in the hold on top of the power supply housing) or a flat-bladed screwdriver, gently, very gently turn each adjustment rod counterclockwise to its stop. (This cancels any pre-exposure filtration previously set to neutralize the orange base of colour negatives.)

Place an average 18 percent gray card or photographic print under the spring flap on the right side of the enlarger head. This reference patch is used by the AC800AF to routinely compare a neutral gray to the negative. It should be permanently left in place. (This reference spot was also used to read test print density when calibrating the AC800AF automatically. Because we are calibrating manually and subjectively, the gray card reference patch may reside permanently under the spring flap.

Power on the AC800AF with the negative carrier — but no negative - in place. Also, ensure there is *no* filter in the tray above the light mixing box. This allows the AC800AF's internal densitometer to measure the raw white light from the light mixing box.

Have the densitometer read the gray reference patch by holding **ENTER** and tapping **BAL.ADJUST.** You should not have to do this again unless you change the reference patch or the machine suffers a memory failure.

Hold **ENTER** and tap **CHANNEL (MODE SEL)** to display "B/W". Release **ENTER.** (You should not have to repeat this step unless the AC800AF suffers a memory loss.

Step 1: Prepare Enlarger for Channel Calibration

For calibration with the 50mm lens, position the bottom edge of the enlarger head carriage bracket to hide the "MF8" position on the 50mm scale of the vertical column. For the 80mm lens, position the head at "MF4" on the 80mm scale. For the 105mm lens, position the head at "MF2" on the 105mm scale.

Place a normally exposed and developed negative with a uniformly neutral gray central area in the carrier. A dedicated, solidly toned reference negative with a density of 0.7 would be even better. The Durst AC800AF was supplied with a set of reference negatives; if you have them, use them.

Step 2: Set Lens Focal Length and Aperture for the Channel

For clarity, this step assumes calibration of Channel 0, for use of the 50mm lens, 35mm negative carrier and Ilford Multigrade filter 0.

Place filter 0 in the filter tray atop the light mixing box.

Ensure that the 50mm lens is installed, with aperture set to f/8.

Tap **CHANNEL** repeatedly to select the target channel (0) for calibration.

Tap **SETUP** to enter exposure calibration mode. The display should show "C".

The lens focal length is displayed. Toggle + and - to select 50mm. Tap **ENTER** to save and automatically proceed to selection of lens aperture.

Toggle + and • to select f/8. If the aperture display blinks, choose an larger or smaller aperture until the blinking stops. Ensure that the physical aperture setting on the lens matches the selection displayed on the enlarger head. Tap **ENTER** to store and proceed to density calibration.

Step 1: Clear Previous Channel Calibration

The symbols "C" and "D" for density should be displayed. Zero any existing setting by simultaneously pressing + and -. Hold **ENTER** and tap **SETUP** to store in calibration memory.

Tap SETUP to continue to "XCP" which is for reciprocity compensation when making very large colour prints. Tap **SETUP** again to skip past "XCP" and continue to "LN" which is for light negative calibration. The lens focal length should be displayed. Select the focal length and tap **ENTER** to display the density setting for LN. Zero the LN density value by simultaneously pressing + and -. Then store in calibration memory by holding **ENTER** and tapping **SETUP.** Repeat this for DN.

NOTE: *In black-and-white mode, the AC800AF does not use LN or DN values. Consequently, you could simply skip through XCP, LN and DN by repeatedly tapping SETUP, without displaying and zeroing the density values. We suggest doing it purely for the purpose of digital hygiene.*

The AC800AF automatically exits calibration mode. The display should indicate the following conditions: "B/W 0 Cd 0"

You have now cleared the Channel 0 memory of any previous calibration data.

Step 2: Calibrate Exposure Density
This first channel calibration will set the baseline for subsequent channels, so relax and take the time needed to get it right.

Tap **SETUP** to re-enter exposure calibration mode. The display should show "C".

The lens focal length is displayed. Toggle + and - to select 50mm. Tap **ENTER** to save and automatically proceed to selection of lens aperture.

Toggle + and - to select f/8. If the aperture display blinks, choose an larger or smaller aperture until the blinking stops. Ensure that the physical aperture setting on the lens matches the selection displayed on the enlarger head. Tap **ENTER** to store and proceed to density calibration.

Make an initial test exposure by placing paper in the easel and tapping **EXPOSE.**

Develop the paper in fresh developer, at the exact recommended temperature and time. Rinse and dry the print with a paper towel and hair dryer, if you have one.

The dried print represents the AC800AF's uneducated guess at proper exposure. Evaluate the print for overall density (not contrast - that's what the multigrade filters are for).

Toggle + and - to increase or decrease print density. Higher density means darker; lower density means lighter. Thirty density units equals one stop in the conventional expression of exposure change.

Estimate how many density units change is called for and make another test print.

Repeat until you have a print whose average density equates to an average gray as represented by an 18 percent gray card (or the reference patch attached to the enlarger head). Record the density value on paper, unless you are young enough to remember it.

Store the density value by holding **ENTER** and tapping **SETUP.** The enlarger display will show "GALE" while the density value is being stored in memory. (The AC800AF makes this change to the baseline for this specific channel only. In production mode, the density will be displayed as '0" since that represents the new baseline, not your change to the default, uncalibrated baseline. You may retrieve the density calibration value by tapping SETUP and stepping through the calibration procedures.

The AC800AF remains in calibration mode. Tap SETUP to skip through XP, LN and DN.

Tap **SETUP** one more time to exit calibration mode.

Step 3: Calibrate Additional Channels

Select the next channel and clear its calibration data as described in Step 1.

Place a grade 1 filter in the filter tray.

Toggle **CHANNEL** to select Channel 1. Tap SETUP to enter calibration mode.

Tap ENTER to set ens focal length and **ENTER** again to set lens aperture.

With "C d" displayed to indicate density calibration, toggle + and -, select the same density value as recorded during the calibration of Channel 0.

With the grade 1 filter in place, make a test print and evaluate it against the 18 percent gray card. Adjust the density value and make successive test prints until you have an average density print. Store the adjusted density by holding **ENTER** and tapping **SETUP.** Tap SETUP to skip through XCP, LN and DN and exist calibration mode.

Use this same procedure to calibrate successive channels, using the Channel 1 density value as the starting point for Channel 2, and so on.

Appendix 3 shows a sample configuration and calibration table, based on my own workflow and experience.

Step 5: Change Aperture Temporarily to Increase Exposure Time

As with a conventional enlarger, a halving of lens aperture means doubling exposure time to achieve the same result. This is the strategy for increasing exposure times to permit dodging or burning with the AC800AF. The enlarger will automatically double exposure time for each full stop change in aperture value.

First, let's move the enlarger head to the correct height for calibration (MF 8 for the 50mm lens).

Temporarily stop down the lens and temporarily match the new aperture value in the channel calibration. Tap SETUP to enter calibration mode, tap ENTER to skip lens focal length, toggle + and - to select the new, temporary aperture value, then tap ENTER repeatedly to skip through XCP, LN and DN and revert to production mode. Do not hold **ENTER** and tap **SETUP,** as this would permanently modify the channel calibration.

The AC800AF will automatically change exposure time to match the new, temporary aperture value. The aperture value will reset to its calibrated value when the channel is changed. Remember to restore the physical lens aperture to its previous value.

Step 6: Retrieving Density Values and Exposure Times from Calibrated Channels
You should retrieve and record the density values for each channel for easy recalibration in the event of memory loss (yours or the enlarger's).

In normal production mode ("B/W" showing in the display) select the target channel. Tap **SETUP** to launch calibration mode. Tap **ENTER** to step through lens focal length and aperture. The density value should now be displayed. Write it down. Continue tapping ENTER to step through XCP, LN and DN and exit calibration mode.

To see the exposure time in a calibrated channel, select the channel. Tap **LIGHT,** then tap **DISP. SELECT** to see exposure time (Ey).

Section 3: Production Mode

Now that auto-focus has been trained and channels calibrated for auto-exposure, you may happily proceed to production printing.

Step 1: Power-on Procedure

At power-up, the AC800AF automatically measures light emerging from the light mixing box. Therefore, there should be a negative carrier and mask in place, but *not a negative.* Ensure that the appropriate light mixing box is in place.

"B/W" on the display indicates the AC800AF is ready for black-and-white printing.

Step 2: Printing *a* Negative

Select a negative for printing and evaluate it for density. Decide which multigrade filter will produce the best contrast. Place the filter in the filter tray. Place the negative in the negative carrier.

Tap **CHANNEL** to select the desired exposure channel. The density display should show "00". If not, press + and - to zero it. This display does not indicate the density value calibration for the channel. Instead, it shows any temporary increase or decrease in density entered by the operator in the course of production.

Verify that the lens and its aperture setting match the channel's calibration.

Tap LIGHT to illuminate the enlarger lamp and proceed to scale and compose the image on the baseboard. You do not need to have a blank sheet of paper in the easel as you might for manual focusing. Tap **LIGHT** again to extinguish the enlarger lamp.

Tap EXPOSE. The AC800AF densitometer reads the negative density and applies the right duration and intensity of light required to make a balanced print.

Develop the paper and evaluate the print for over- or under-exposure.

If the print is too light, tap **DISP.SEL.** to display the Density value. Tap + to increase the Density value. Thirty density units equates to one full aperture stop.

If the print is too dark, tap **DISP.SEL.** to display the Density value. Tap - to decrease the Density value. Thirty density units equates to one full aperture stop.

Tap HOLD to retain the temporary change. Make another exposure. Density can be further adjusted for additional test or production prints.

With the green ***HOLD*** LED illuminated, the density change will *be* retained for

subsequent exposures of the same or subsequent negatives. Cancel the temporary density change by tapping **HOLD.**

Step 3: Changing Aperture Temporarily to Increase Exposure Time

As with a conventional enlarger, a halving of lens aperture means doubling exposure time to achieve the same result. This is the strategy for increasing exposure times to permit dodging or burning with the AC800AF. The enlarger will automatically double exposure time for each full stop change in aperture value.

First, let's move the enlarger head to the correct height for calibration (MF 8 for the 50mm lens).

Temporarily stop down the lens and temporarily match the new aperture value in the channel calibration. Tap SETUP to enter calibration mode, tap ENTER to skip lens focal length, toggle + and - to select the new, temporary aperture value, then tap ENTER repeatedly to skip through XCP, LN and DN and revert to production mode. Do not hold ENTER and tap SETUP, as this would permanently change the channel calibration.

The AC800AF will automatically change exposure time to match the new, temporary aperture value. The aperture value will reset to its calibrated value when the channel is changed. Remember to restore the physical lens aperture to its previous value.

Step 4: Transferring a Temporary Density Change to Channel Calibration Memory

If you desire to copy the temporary density adjustment to the channel's memorized density calibration, hold ENTER and tap SETUP.

Do this only for negatives with an average neutral density, otherwise calibration will be skewed in favour of under- or over-exposed negatives. Such poorly exposed negatives should be dealt with using only temporary adjustments to density.

This way, as production use progresses, the AC800AF will fine-tune exposure to meet your expectations. Remember to periodically note the density calibration of each channel for reference and possible restoration after a battery failure.

Section 4: Making Contact Sheets

Step 1: Read a Representative Negative

Set the magnification so that the enlarger light just covers the paper in the contact sheet easel.

Select a negative representative of the film strips to be proofed on a contact sheet. Expose the negative normally, *without paper in the contact proofer.*

Tap FXFF to fix exposure and fix filtration. This locks the AC800AF to the exposure time and density calculated for the single negative.

Step 2: Expose Contact Sheet

Remove the negative from the carrier and arrange with the others to be proofed on a sheet of enlarging paper. Place a sheet of glass over the negatives and paper.

Tap EXPOSE to expose the contact sheet.

Make additional contact sheets as desired. It should not be necessary to make another negative exposure unless the density of a particular set of negatives varies considerably.

Release the exposure and filtration lock by tapping **FXFF.**

Appendix 1: Key functions

This describes the functions of the various switches and keys on the AC800AF power supply enclosure and on the enlarger head itself.

Power Supply Switches EXPOSE

Tap to trigger the AC800AF sequence of density measurement, filter deployment and lamp illumination.

LIGHT
In production mode, Illuminates the enlarger lamp for image composition. Turns off lamp to interrupt an exposure. In focus training, moves lens carrier down.

W.LIGHT
In black-and-white production mode, same as LIGHT. In focus training, moves lens carrier up.

POWER Powers AC800 on and off.

Enlarger Head Keys BAL.ADJUST

Not used in print production mode.
Used in channel calibration to read gray reference patch under spring flap on right side of enlarger head.

ENTER
In channel calibration, used to confirm lens focal length and aperture and continue to next step.
In combination with SETUP, stores density calibration values in memory.

SETUP
Not used in print production mode, except to transfer working density adjustments to permanent channel calibration in combination with ENTER.
Used to initiate calibration of a selected channel.
Used to skip through XCP, LN and DN calibration and exit calibration mode.
In combination with ENTER, stores density calibration values in memory.

HOLD
Used in print production mode to retain adjustments to density values for subsequent prints of the same or additional negatives. Tap key to release hold.

FXFF/VXFF

FXFF is used in black and white printing only in the production of contact sheets.

VXFF is never used in black and white printing.

F.VAR./ILL
Toggles enlarger LED display on and off. If display is blank, tap this key. There is no advantage to toggling it off since the LED colours are safe.

Also used as "focus variator" to enter an offset from normal easel height when projecting image on wall or floor. Not relevant for normal print production with the same easel used for auto-focus training. Consult original Durst AC800AF user guide for this functionality.

CHANNEL (MODE SEL)

In print production mode, selects a desired exposure channel.

In combination with ENTER, used to set colour mode (Neg, Pos, B/W).

DISP. SELECT
In print production mode, tap to display the active channel's calibrated lens focal length.

With LIGHT on, tap to display exposure time for current negative in the carrier.

Appendix 2: Technical Specifications

Replacement lamp: GE 24V/250W halogen lamp. There is no advantage to the original and expensive Colamp 250S which was corrected for colour work.

Appendix 3: Sample Channel Calibrations

Here, for reference, are sample hardware configurations and density calibrations for the 10 channels:

For 35mm printing

Channel 0, mixing box 35, Multigrade Filter 0, L50, f/8, Density -25

Channel 1, mixing box 35, Multigrade Filter 1, L50, f/8, Density 0

Channel 2, mixing box 35, Multigrade Filter 2, L50, f/8, Density +10

Channel 3, mixing box 35, Multigrade Filter 3, L50, f/8, Density +20

Channel 4, mixing box 35, Multigrade Filter 4, L50, f/8, Density +25

Channel 5, mixing box 35, Multigrade Filter 5, L50, f/8, Density +25

For MF printing

Channel 6, mixing box 69, Multigrade Filter 1, L80, f/5.6, Density +60

Channel 7, mixing box 69, Multigrade Filter 2, L80, f/5.6, Density +60

Channel 8, mixing box 69, Multigrade Filter 3, L80, f/5.6, Density +70

Channel 9, mixing box 69, Multigrade Filter 4, L80, f/5.6, Density +70