



COLOR 3TAR 2000  
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L EDIEN1|NGSAML8 ITUNG

We are delighted that with the COLOR STAR 2000 you have chosen a device which, thanks to its versatility, is sure to be a valuable aid in your color laboratory.

To ensure that you can enjoy the appliance for a long time and make full use of its features, we recommend that you first familiarize yourself with the COLOR STAR 2000 using these instructions.

Please note in principle:

- Device and measuring head protected from moisture, humidity and chemicals protect
- Do not place the measuring head on warm objects (above room temperature)
- Only connect the device to a mains supply that has the values specified on the back of the device
- Do not switch the device OFF and ON between measurements

## L I E F E R A N C E

Analyzer with

1 contact head with connection

cable 1 power cable

1 memory module (item no. 6311) with sticker

3 display buttons with a handle for module

1 measuring head

attachment, clear 1

measuring head

attachment, matt 1

diffuser i be

1 hole p1 atte for 4 m point measurement

Sample ideal magnification 13x18

Test tnegati v and test di a 35 m

## T E C H N . D A T E S :

Mains connection: 220-240 V / 50-60

Hz Power consumption: max. 10 watts

Switching capacity: 1320 watts

Device fuse: 6.3 Amp. 5 x 20 m



# INHALTSUEBERSI CHT

	<u>Page</u>
CHAPTER I : GENERAL PRINCIPLES	4
CHAPTERII : EXPLANATION OF THE FUNCTIONAL AND OPERATING ELEMENTS	6
CHAPTERIII : THE MEASUREMENT METHODS	10
1. Integral measurement	10
2. Partial integral measurement	10
3. Selective measurement	10
CHAPTERVI : COMMISSIONING	11
CHAPTERV : PROGRAMMING (CALIBRATION)	12
1. Program. on known motifs	12
a) Preparations	12
b) Programming procedure	12
c) Entering the color values	13
d) Entering the exposure values	14
2. Registering the calibration values	15
CHAPTERVI : THE DETERMINATION OF FILTER AND EXPOSURE VALUES	16
Correction for motifs with strong color dominants	18
CHAPTERVII : THE EXPOSURE PROCESS	19
'a) Exposure with the determined Value, acoustic signal	19
b) Interruption of the exposure process	19
c) Manual exposure time setting position	20
CHAPTER VIII : BLACK AND WHITE WORK	21
a) Programming	21
b) Exposure time measurement	21
c) Determining the paper gradation	21
Designation of the operating elements	22
Operating instructions in short form	23
Overview drawing (fold-out)	

## CHAPTER I : GENERAL PRINCIPLES

In the following, we have summarized the most important rules of assessment and filtering for coloring:

### Rules of use:

with enlargement of Negativ:

Each time the exposure time is longer, the picture is darker. If the exposure time is shorter, the picture is lighter.

when enlarging from the negative:

the longer the exposure time, the darker the image. The shorter the exposure time, the lighter the image.

### Filter rules:

In subtractive color filtering, the light is filtered from the three colors YELLOW (YELLOW), MAGENTA (PURPLE) and CYAN (BLUE-GREEN).  
mixed together.

If two of these colors are "mixed" in equal parts, the result is the Complementary or opposite color of the third color.

Here are some examples:

YELLOW + MAGENTA = RED (the complementary color of CYAN)

MAGENTA + CYAN = BLUE (the complementary color of yellow)

The following drawing illustrates the relationship between the individual colors. The continuous lines indicate the resulting paint color, the striated lines indicate the lines to the respective

Complementary or opposite colors. If two colors are mixed in different proportions, a corresponding color is created.

Two colors.

If the three colors are mixed in equal proportions, the result is a neutral shade of grey.

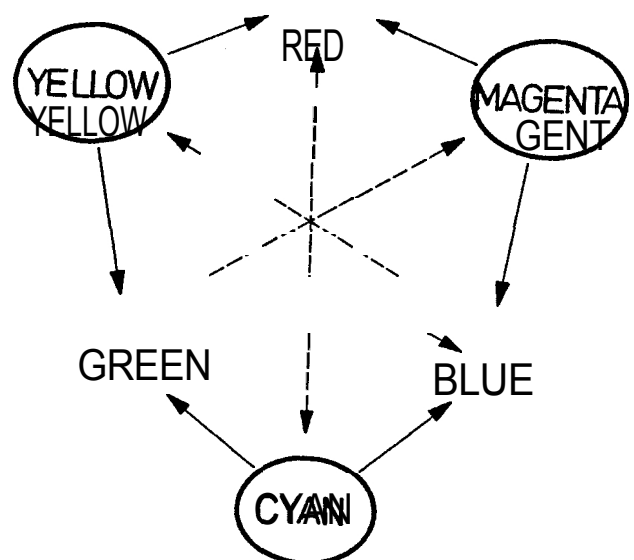
For this reason, you should only ever use the same colors when enlarging colors.

If, for example

50 Y + 50 M + 20 C filter,

would have the same color

Result as for filtering 30 Y + 30 M.



This can also be explained in computational terms:

For this purpose, the filter values are first analyzed in the usual Order: YELLOW / MAGENTA / CYAN noted:

If you have three filter values, the lowest value of all three values is used. This leaves the desired filtering remains with only two values.

In our example, this would look like this:

	50	/	50	/	20
from	20	/	20	/	20
zug11ch :	30	/	30	/	—
results:					

#### Color filtering when enlarging the negative:

The stronger the filtering, the more important the filtered color in the image.

(e.g. if the slide has a gel stick, it must be filled with YELLOW. )

However, if one color is filtered too strongly, the color cast "tilts" to the corresponding complementary color. For example, too much yellow filtering would cause a blue cast.

#### Color filtering when enlarging slides:

The more pronounced the filtering, the more pronounced the filter color will appear in the finished image.

For example, too much YELLOW filtering would cause a yellow cast. A B1a stick (B1a is the complementary color of YELLOW) 1, on the other hand, can be eliminated by increasing the YELLOW filtering.

Here is another principle that applies to all color processes:

Parts of the image that have a grey tone are particularly suitable for color assessment. Color casts are clearly visible on the grey area.

Parts of the image with strong colors cannot be used for color assessment. be. (Ideal aid for color determination: JOB0 color test chart Art.6817)

If the F11 ting is still at the same color as the slides, it stops at the other colors of the slides too! (important for color matching according to the set ecti v method)

Assess the filtering of the light, they are similar to daylight or daylight eon tubes.



## KAPITEL II: ERLÄUTERUNG DER FUNKTIONS- U. BEDIENUNGSELEMENTE

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In this chapter you will first find out what functions the individual elements have. For a better understanding, you can click out the illustration of the last cover page:

### Mains switch (1)

The entire appliance is switched off with the mains switch. The switch is in the "ON" position when the marked side is pressed.

### Device protection (2)

The device fuse is located in the holder labeled FUSE, maintenance of the network.

Changing the fuse: Pull the fuse plug! Unscrew the fuse holder in the arrow position. Replace the fuse (6.3 A.) and screw the holder back in.

### Mains cable connection (3)

The enclosed mains cable is plugged in here. Please only connect the device to a mains supply with the values printed above the mains switch.

### Socket for Enlarging device (4)

The enlarger to be switched is connected to this socket. The maximum switching capacity is 1320 W.

### Measuring cable I connection (5)

This round connection socket is located on the opposite rear of the appliance. The plug of the measuring cable is plugged in here and locked by turning the metal ring.

### Storage recesses for accessories (6)

Accessories that are not currently in use can be attached here. The controller knobs and the module's retaining bracket can be clamped into the top row, and one of the nephad attachments into the bottom row.

### Color tern display (7)

The color star display consists of one row of LEDs each for the Colors YELLOW (Y), MAGENTA (M) and CYAN (C), The color cast determined by the measuring cell is indicated by the corresponding row of diodes lighting up. The further the rows are light up on the outside, the stronger the filter must be with the displayed color. The color star display is extinguished by adjusting the filters on the coarsening device.

If the display flashes during the measurement, this indicates that the brightness is too low. In this case, open the object end.

### Digital display (8)

The digital display shows the exposure time in seconds. By pressing the value buttons (15) you can also change the exposure time.

Read the positions of the individual module registers (= values).

### Module check (9)

Here, the Hodu1-units are uncovered so that the web of the module is at the bottom links.

### Time-number slice (10)

The operating time can be set manually by turning the dial.

However, the TIME button (20) must be pressed at the same time. The set value is displayed on the display (8).

### Pointing shutter (11)

Two ranges can be selected for the bell time: switch position 100 for the range 0.1 to 99.9 sec.

Switch setting 1000 for the range 1 to 999 sec.

If the time ranges are exceeded, the digital display shows the EEE symbol.

### Signal switch (12)

The signal switch (BLEEP) can be used to switch on an acoustic signal that sounds during the exposure process. Depending on the position of the timer switch (11), the signal sounds every second or every 10 seconds. The Signal helps to estimate the elapsed time if manipulations (e.g. "turn off") are to be carried out during the exposure process.

### Negative/Slide switch (13)

As negative and slide processes have different color and exposure ranges, the most favorable working method for the corresponding process is selected here. For black/white work, select the Slides switch setting.

### Slope-Linear switch (14)

When the 'SLOPE' switch is set, the "Schwarzschild effect" is corrected during exposure compensation. (This is the increase in sensitivity with increasing exposure time). Which papers require the SLOPE setting can be found in the guide value table on Page 15 visible. Use the LINEAR switch position for the black/white process.

### Calibration value buttons (15)

The position of the corresponding module controller can be read on the digital display (8) by pressing the calibration value buttons. We refer to these values as "calibration values". Press the "Yellow" button to read the value of the upper module controller, the "Magenta" button to read the value of the middle module controller and the "Sensitivity" button to read the value of the lower module controller. The values displayed are in the range 300-900 for the upper controller and around 500 - 900 for the lower controller.

### ANALYSIS button (16)

Press this button to switch on the setting. G1ei ch-

At the same time, the connected enlarger also switches on. The color and exposure values recorded by the measuring head are now displayed by the color star (7) and digital display (8).

### HOLD button (17)

Pressing this button ends the measuring process and the last measured exposure value is recorded in the display. The color star switches off, the enlarger remains switched on.

### READY button (18)

Pressing this button switches off the magnifier without changing the value stored in the display. This allows you to place the item to be viewed in the magnification frame.

### EXP0SE button (19)

Pressing the EXP0SE button starts the exposure process. After the exposure time has elapsed, the enlarger is switched off. The digital display remains unchanged.

To interrupt the ongoing exposure process, after finding and press the ( 17) HOLD and ( 18) READY buttons.

### TIME button (20)

This button is used for manual time setting. After pressing the HOLD or READY button, the desired exposure time can be set by turning the time dial (10) while holding down the time button.

### Functional displays (21)

The lights above the operating buttons (16), (17), (18), ( 19) indicate , which function the device is currently performing.

### The modules

The modules contain three different controls that are used to calibrate the Color Star 2000 for color and light sensitivity. The first step is to put on the outer control knobs and fix them by attaching the main bracket (Fig. 1). The module 1 can only be adjusted as follows

insert into the module slot (9) so that the housing recess at the bottom links is located.

To prevent the controllers from being misaligned after calibration, the control knobs can be removed again by removing the handle. (Fig. 2)

The control knobs and handlebars can be clipped into the recesses (6) on the back of the appliance for storage.

From the enclosed labels on the module, you can note

conditions

used as a basis for the setting. Fig. 3 shows an example.

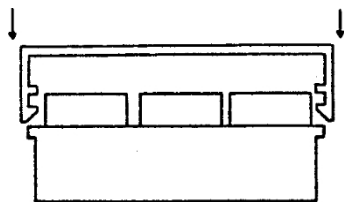
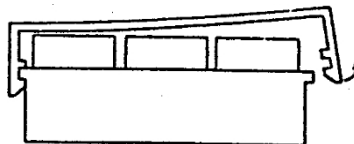


Fig. 1



Abb' Z

MAT. <u>Agfa color</u>	SLOPE	COLOR	y <u>605</u>
NO.: <u>3</u>	CORR.	NEG.	M <u>540</u>
RAST-INTERVAL SPOT $\leftarrow$ mm / 8 mm	<input checked="" type="checkbox"/> LINEAR	<input checked="" type="checkbox"/> SLIDES	S <u>750</u>
<u>Hutton</u>			

Fig. 3

### The Meo head

There are four photodiodes in the measuring head that enable simultaneous Measurement of all color and exposure values possible.

In order to be able to use different measuring methods, various attachments are included with the measuring head.

The entire 8eßkop f can be ki ppt so t hat t he pesszell e can be precisely aligned to the angle of incidence of the light.

### Me6head attachments

#### a) Measuring head attachment clear with black ring

This attachment is used for nominal selective measurement. The imprinted black ring casts a shadow, which the impact of the light on the target cell can be recognized. The tip is positioned by means of pinning in such a way that the pinning cell is exactly in the center of the shadow.

#### b) Matt contact head

This attachment performs a diffuser function. It is required for partial integral measurement.

Both measuring head attachments can be simply attached to the measuring head and removed again by pulling gently to the side.

#### c) Perforated plate for 4 m point measurement

This black shim is used to reduce the aperture to 4 mm. It is used if only a very small part of the image is to be captured during selective (point) measurement.

The disk is glued under the clear measuring head attachment before it is attached to the measuring head.

#### d) Diffusing disk

The diffusing screen is not attached directly to the microscope head, but underneath the lens. üfor this purpose, the red filter holder of the enlarger can be used if necessary.

This diffusion disk is only used with the integral measurement method (total measurement). to the application.

Proceed as described under point a above.

## KAPITEL III: DIE MESSMETHODEN

Various measurement methods can be used to determine the color and exposure values. Depending on the size of the bi1dante i t taken into account in the measurement, a distinction is made between integral measurement, partial integra1on measurement and se1ecti1ve measurement.

### 1. Integral measurement (total measurement)

With integral measurement, the brightness and color values of the ce-  
The complete notes are included in the measurement. For this purpose, the enclosed  
The shroud is attached about 5 cm below the object (possibly with a red filter).  
The now projected, colored image is the nJ lation of all color and  
brightness values of the notebook. The wet head (with a matt finish) is  
placed in the center under the lens.

Integral metering is only suitable for metering relatively uniform subjects. DaD means that there must not be any strong light or color dominants. If a color is much more strongly represented in the subject, this will lead to incorrect measurement values with this method.

### 2. Partial integral measurement (partial surface measurement)

With partial integral measurement, only the values of a specific image section are recorded. For this purpose, the matte attachment is placed on the measuring head. The measuring head can now be placed in such a way that the window captures a part of the image that does not have a color dominant.

For this reason, partial integral measurement is used most frequently. It is advisable to gain initial experience with the Color Star 2000 during partial integral measurement.

Moti ves that are dominant in all bi1dtei1es require a correction of the measurement result, describing them on page 21.

### 3. Se1ek ti vmes sung (point measurement)

With selective measurement, only one subject area is captured that corresponds to the size of the cell aperture ( $A_m$ ). This method is only suitable for color matching if a very specific, individual color is being targeted (e.g. skin tone for portraits). It is important to remember the principle that if one color of the motif is correct (e.g. skin tone), all other colors are also correct.

With this method, the transparent attachment with the black marking is placed on the measuring head. The shadow of the ring on the measuring head indicates the angle of incidence of the light. By tilting the measuring head, the measuring cell is brought exactly into the center of the shadow ring. The part of the image to be measured is then captured exactly by the measuring cell.

For formats smaller than 13 x 18 cm a smaller opening of the MeDzelle is the selection of prefixes i 1 .

In this case, the enclosed perforated plate can be clamped under the transparent attachment to reduce the measuring cell opening before it is placed on the measuring head.

The normal diameter of the Mepzelle of 8 mm is reduced by this dimension. diameter to 4 mm.

Caution: If the measurement method is changed, the calibration of the analyzer must be changed!

## CHAPTER IV COMMISSIONING

This chapter describes the general procedures that must be carried out before working with the appliance.

The other processes are described in the individual chapters.

- Insert the probe cable 1 into the connection socket (5) and turn it of the ring.
- Plug the enlarger into the socket (4) (max. nominal power: 1320 watt).
- Connect the mains cable
- Insert speaker module 1 into the nodu1 shaft (9).
- Switch off the device on the external switch (1) .

To enable accurate work, it is recommended that the appliance is set to approx. 30 NJ nutes before the start of work.

The device should not be switched OFF and EU during work. be switched off.

### Dark1 chamber treatment

Since the me|3cles of the COLOR STAR 2000 react very sensitively, the darkroom lighting, which is possible for some work, can influence the me|6sult.

It isst therefore advisable to dispense with dark camera lighting during the shooting process in order to achieve optimum measurement results.

## CHAPTER V: PROGRAMMING (CALIBRATION)

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### 1.) Programming on motifs with known values:

#### a) Preparations

The motif that you want to use as the basis for programming must fulfill certain requirements. It is suitable, if it is relatively balanced in terms of color, i.e. has no color dominants, and if there are no extreme lighting conditions.

Exception: If only a single color (e.g. skin tone) is to be calibrated using the selective method, the color uniformity of the overall motif is not required.

Furthermore, the color filter values and the exposure values such as magnification, f-stop and exposure time must be known.

#### b) Programming process

- Switch on the appliance at the mains switch (1) (preferably 30 minutes before starting work).
- Press the ANALYSIS button (16) - the enlarger is now switched on. switches.
- Insert the module unit into the module slot (9) with the control knobs and retaining bracket attached.
- Insert the selected subject into the enlarger and set the known filter values on the enlarger. Also set the magnification factor and aperture to the values determined.
- Set the time range switch (11), Neg./Slides switch (13) and SLOPE switch (14) to the corresponding positions.  
Linear for color negative paper and Slope for color reversal paper.
- Place the measuring head under the enlarger according to the measuring method to be calibrated. This means

with integral measurement:

in the middle under the lens, under which the diffusing lens is attached at a distance of approx. 5 cm.

for partial integral measurement (recommended for the beginning): Place the measuring probe with the matte head attachment on the part of the image with the most balanced colors and brightness.

with selective measurement:

To program the color, first place the measuring head with the attached clear attachment underneath so that only the desired color (e.g. skin tone or gray tone) is detected by the measuring cell.



It is advisable to program the exposure time to the brightest part of the image that still shows. The hot head is positioned so that the measuring cell only captures such a part of the image.

Se1bs tversely, it is also possible to carry out the programming on the darkest part of the screen, ue1cher still showsst, oralso on a skin tone. However, this must be noted, as you will also have to change the settings to the corresponding (lightest) color later on. or darker points.

Further information on the individual me6ures can be found in Chapter III on pages 10 and 11.

### c) Entering the color values

After the Voperations described above have been carried out, the LEDs of the color star (7) and the digital display (8) will show values.

If some diodes of the color star display (7) flash, the lens diaphragm must first be opened further, as the brightness is not sufficient for color measurement.

The first step is to switch off all diodes of the color star (7) by adjusting the module controller. To do this, proceed as follows:

To extinguish the YELLOW diodes, turn the upper module regulator clockwise (Fig. 4)

If the control is turned too far to the right, this will cause the other color series to light up. In this case, turn back until shortly before the first YELLOW LED lights up (Fig. 5).

The MAGENTA diode row of the color star (7) is now switched off in the same way using the middle module controller (Fig. 6). Here too, turning too far to the right can cause the other two color rows to light up. Here too, turn back to the left until just before the first MAGENTA diode lights up (Fig. 7)

The YELLOW series diodes that may light up again during MAGENTA adjustment can be extinguished by turning the upper module control to the right.

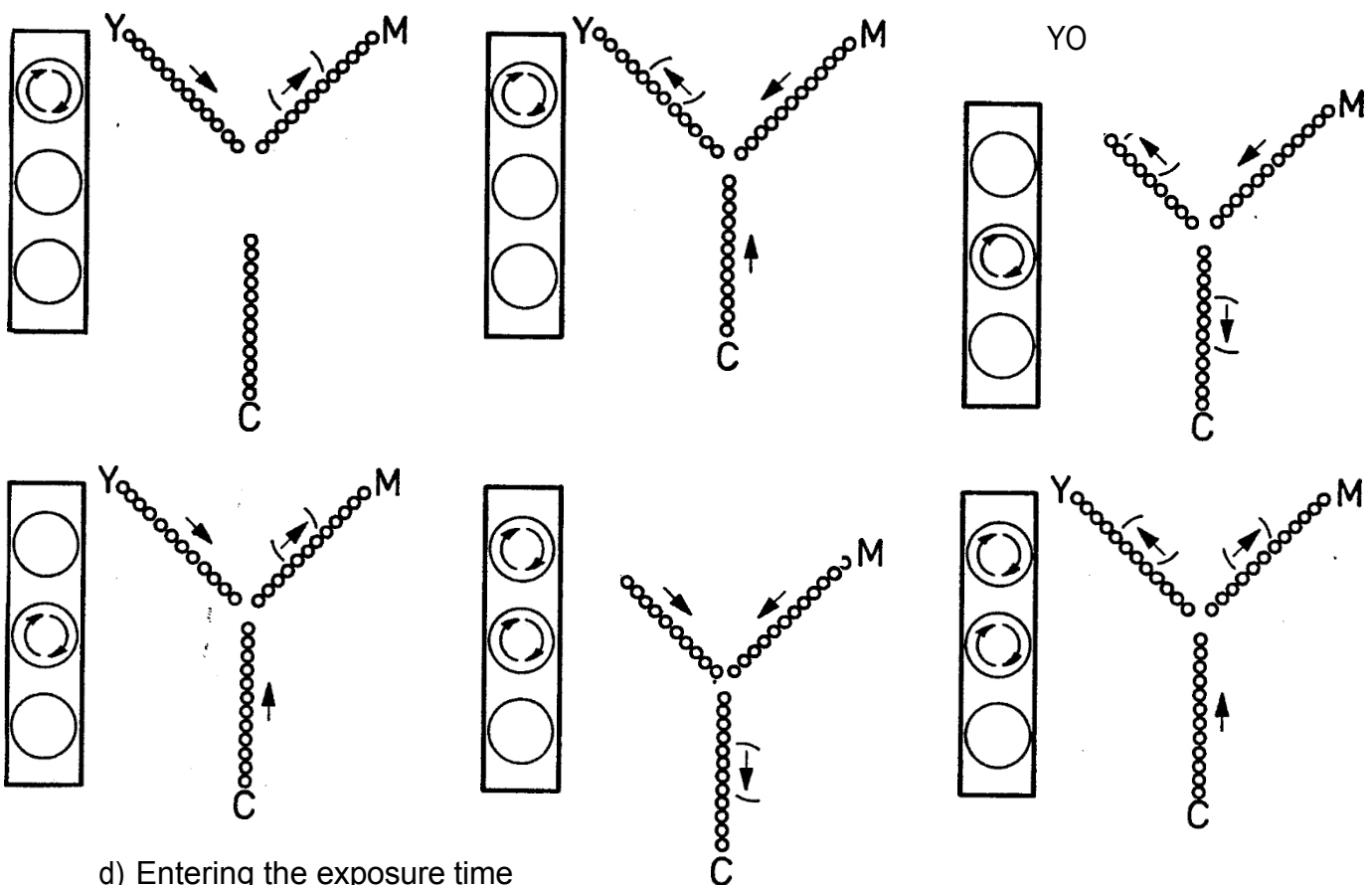
There is no separate module controller for the CYAM diode series. If the CYAN row lights up, this means that too much of the CYAN complementary color RED has been stored. Let us remind ourselves once again that RED is made up of YELLOW + magenta and therefore too many of these two colors have been entered at.

Byturning the left-hand dial of the upper module controller (for Y) and the middle module controller (for N), the CYAN series is extinguished (Fig. 8). A renewed illumination of the YELLOW or MAGENTA series is canceled by turning the corresponding controller to the right.

By alternately adjusting the two upper module controls, all lights of the color star display (7) are finally extinguished, thus completing the color calibration.

The figures below illustrate the relative direction in which the color star (7) moves when the nodule controllers for YELLOW and PAGEfTA are offset.

The arrows in brackets indicate which rows light up again if the control(s) are turned too far in the direction shown.



#### d) Entering the exposure time

To enter the exposure time, the magnification scale and f-stop must be set to the position in which they were when the exposure time was calculated.

Place the measuring head under the enlarger according to the measuring method.

(For the selective method, it is almost always necessary to select another meDpoint. compared to color determination or color calibration.

By turning the lower module control (SENSITIVITY), which is used to calibrate the light sensitivity, the desired exposure time is set on the digital display (8).  
the desired exposure time is set on the digital display

(8).

Turning the module controller to the right increases the display value and turning it to the left decreases it.

This also completes the programming for the determination of the exposure times.

You should make a note of a11e SIGNATURES in the stream of the egg, as shown on page 18 described.

### 3. ) Regi stration of the values:

Once the COLOR STAR 2000 has been programmed to color and exposure values via the module, the control knobs and retaining brackets should be removed from the module (see Fig. 2, page 9). This prevents the controls and thus the programming from being accidentally adjusted.

To be on the safe side, you should also note the set control values of the three module controls so that you can return them to their original position after adjusting them.

To read the position of the upper module controller, i.e. the YELLOV calibration value, press the upper YELLOW calibration value button (15). When the button is pressed, the calibration value can be read from the digital display (8).

By pressing the two lower calibration value buttons (15), the values of the two lower module controllers can be determined in the same way.

The calibration values of the two upper buttons (Y and M) are in the range 300 - 900, the value of the lower button (SENS.) approximately in the range 500 - 900.

In order to record the conditions on which the E1chung is based, we recommend that you print out the enclosed module stickers.

Hf-r can be used to store information about the used material<sup>1</sup>, the measuring method, the switch parts and the values of the module controllers.

An example is shown in Fig. 3 on page 9.

Every change of paper type or milking process  
requires recalibration!

If you work alternately with different methods, you have the option of purchasing several module units (Art. No. 6311), which are then calibrated to one method each.

If you are working with several methods but only with one module, we recommend recording the calibration values determined once for each method in a table.

This could look like this:

Material Value	Calibration YELLOW	Calibration value MAGENTA	Calibration value method SENSIV.	Measuring
<hr/>				
At spi el :				
Ektacolor	665	614	788	Partial integral
Agfacolor	605	544	755	Selec. 8 mm
US\$/.				

## KAPITEL VI: DAS ERMITTELN VON FILTER- U. BELICHTUNGSWERTEN

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The COLOR STAR 2000 can only be used to determine the values if the device has been calibrated to the corresponding method beforehand.

First, insert the nodule that has been calibrated to the desired Vexperience into the nodule shaft (9).

Pressing the ANALYSE button (16) switches the magnification device and the designation.

Insert the negative or slide into the negative stage in such a way that it does not shoot off (not required for selective measurement)

NEG/SLIDES switch (13) and SLOPE switch (14) in the position used for the The position noted on the nodule.

Set the desired magnification tab and set all color filters to - 0 - .

Place the measuring head under the enlarger according to the specified measuring method. Measurements may now only be taken according to the method used for the calibration.

If the color star (7) flashes, open the lens diaphragm further, as there is not enough light for the color analysis.

Now erase the colors appearing on the color star display (7) by entering the corresponding filters on the coarsening device.

The more diodes of a color series light up, the more must be filtered with this color.

When filtering, always use only two filter colors according to the general basic rules. If the third color row lights up, this indicates that the other two colors have already been filtered too much. In this case, reduce the color filters until the color star indicator (7) goes out with two filter colors.

Since all the filter settings, the filtering diodes that were initially set must be corrected somewhat after the filter has been set.

### Determination of the exposure time:

Here, too, it is important that the measuring head is placed under the enlarger in accordance with the calibrated measuring procedure.

Please bear in mind that with the selective method, the color and weighting value must be determined at different measuring points according to the calibration.

On the digital display (8), the correct exposure time is now displayed. It is displayed in seconds, which should not be less than 2 seconds. By shifting the object blade it is possible to reduce the observation time to the desired range.

The color star (7) lights up during the lighting time measurement has no meaning. By pressing the HOLD button (17), the last measured exposure value is held in the display.

### Summary - kertemization

- Press the ANALYSE button (16)
- Negative or Density, if J terung to 0/0/0 s tellen.
- SLOPE and NEG/SL SWITCHES (14 and 13) in the required positions.
- Underlay MeSkopf according to the programmed procedure
- Diodes of the color star display (7) by screwing in the filters in the enlarger to extinguish.
- Read the exposure time on the digital display (8) and change it if necessary by adjusting the shutter speed.
- Press the HOLD button (17) to save the measured value
- press the READY button (18) before the exposure

The EXPOSURE PROCEDURE is described in chapter VI on page 19.

If it turns out that the color and / or density of a1er the produced bellows do not match after the decalcification of the sheets, it must first be checked whether all sheets have the same error. If this is the case, the calibration must be corrected again.  
be made. Proceed as described on pages 16 and 17.

If only individual motifs show incorrect color and/or density values, please check whether the measurement in this case was taken at an unfavorable measuring point. Then repeat the measurement at a different, more balanced subject position.

If the Me5 result of the integral and partial integral measurement is influenced by excessively strong Fafb dominants, the excess value can possibly be corrected as described in the following chapter.

## CORRECTION FOR MOTIFS WITH STRONG COLOR DOMINANTS:

With subjects that have large-area color dominants, it is not possible to determine the correct filter using the normal procedure of integral and partial integral measurement.

The full integral measurement is unsuitable in these cases for color determination.

However, the partial integral measurement makes it possible to determine the correct color filter values even in these cases if used appropriately.

For this purpose, certain empirical values and the LED display of the color star (7) are used.

Let us take As an example of a strong color dominant a motif with refuse alouot out of water.

The gauge head is now positioned so that the dominant color in particular (in our example, the blue water) is captured.

In order to compensate for the color overlap, the following are used in the coloring process not all diodes of the color star (7) are extinguished.

In our example, filtering would result in 2 diodes of the MAGENTA series and 5 diodes of the CYAN series lighting up on the color star (7). (In the negative process)

How many diodes of the individual color star rows must light up for the corresponding color dominants can be determined over time through experience.

To help you get started, here are some examples summarized:

MOTIF		v. Negative			v. Diagonal		
		Y	N	C	'	S	C
GRIJD	(like grass or leaves)	1	0	6	10	12	0
BLUE	(like heaven and Xasser)	0	2	4	8	4	0
WHITE	(with adjacent colors)	0	0	2	44		0
WHITE	(pure)	0	2	4	8	8	0
Skin tone	(be1 normal calibration)	5	0	0	0	10	10
Fire	(red)	10	10	0			

The values shown in the table indicate illuminated diodes the corresponding Farhs ternre i he!

Please note that for the Ems tt1ung of the exposure time givenfa 11s the measurement must be taken on another 'subject part.

## KAPITEL VII: DER BELICHTUNGSVORGANG

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### a) Exposure with the value determined by measurement

Press the GOLD button (17) to record the time value determined by the measurement on the digital display (8).

Then press the READY button (18) to switch off the enlarger and reduce the brightness of the digital display (8). The displayed value remains unchanged.

Pressing the EXPOSE button (19) starts the exposure process.

After the exposure time has elapsed, the enlarger is switched off. The device then returns to the READY position, which is indicated by pressing the function indicator (21).  
via the READY button! .

Press the EXPOSE button again to take any number of exposures with the same exposure time.

Pressing the ANALYSE button (16) switches the measurement on again. t, so that the values for a new hoti v can be determined.

### briefly summarized:

- Press the HOLD button (17) and hold down the value
- Press the READY button (18)
- Underlay the material to be exposed
- Press the EXPOSE button (19) and light up

### Acoustic signal during loading:

If the SIGNAL (BLEEP) switch (12) is in the "ON" position, an acoustic signal sounds during the exposure. This allows you to follow the time sequence.

Depending on the position of the time range switch (11), the signal sounds in the seconds (position 100) , or in the t0-second interval (position 1000) .

### b) Interruption of the operation process

To interrupt the current exposure process, press the HOLD button (17) and the READY button (18) one after the other.

### c) Manual exposure display setting

The exposure time can also be set manually independently of the measured exposure value.

In this case, it does not matter whether the device is in the ANALYZE, HOLD or READY position. The time can be set manually in all three positions.

First set the desired time range using the TIME RANGE switch (11).

Values in the range 0.1 sec. to 99.9 sec. can be set with switch setting "100".

With switch setting "1000", values in the range from 1 second to 999 seconds.

Pressing down the TIME button (20) switches the appliance to manual display. If you are on the digital display (8) with a measured value, this is now deleted.

When the TIME button (20) is pressed, the TIME SELECTION DISC (10) is pressed until the desired time until the desired exposure time value is appears on the digital display (8).

Turning to the right increases the display value, turning to the left decreases it.

If the device is in the "ANALYZE" position during manual time setting, the HOLD button (17) must be pressed before releasing the TIME button (20).

If the manual time setting has been carried out with the HOLD button (17) or READY button (18) pressed, the set time value is saved in the display by simply releasing the TIME button (20).

The exposure can then be carried out as described in section a) of this chapter.

### Consideration - Manual setting:

- Positioning the position of the point (11)
- Press the TIME button (20)
- with the dial (10) while holding down the TIME button (20)  
Set the desired operating time
- Press the HOLD button (17) (if in position "ANALYZE").
- TIME button (20) release

## CHAPTER VIII. RECOVERY OF BLACK/WHITE NEGATIVES

Even with the processing of b/w materials, the COLOR STAR 2000 to determine and switch the exposure time. The most favorable paper gradation can also be determined by measuring the contrast range.

For all b/w works, the Neg/SL switch (13) in the "SLIDES" position and the SLOPE/LIN. switch (14) should be set to the position "LINEAR".

As with color methods, all three measuring methods can also be used in the b/w range. However, the SELEKTIV method is to be preferred here.

### a) Programming

With the set point method, the setting should be carried out on the lightest or darkest point that just shows a line.

Here, too, you need a subject from which the exposure values are known.

The calibration procedure is carried out as described on page 14 under point d). The two upper module controllers have no significance for b/w work.

### b) Exposure metering

To determine the exposure time, the exposure is measured for each subject (depending on the setting) on the brightest or darkest point that still has a drawing. The exposure value is displayed in the DIGITAL DISPLAY (8).

The exposure process is carried out as described on p. 22.

Please note that the relatively bright dark camera illumination used for B/W work must be switched off during the measuring process. This is the only way to achieve the most accurate results.

### c) Determination of the paper grade

To find the most suitable paper gradation for the motif, the COLOR STAR 2000 can be used to determine the contrast range of the motifs.

However, it is only possible to find out which paper gradation covers the contrast range of the picture. Whether a different paper gradation brings out the motif better, however, also depends on the personal taste of the user. The paper gradation provided by the device can only be indicative.



Selective measurement is used for this. First switch on the measurement by pressing the ANALYSE button (16).

First measure the brightest subject point that still has a drawing. Note the value shown on the digital display (8). It is easier for the later calculation if you bring the value to a "round" number with the help of the lower module controller. Please bear in mind, however, that this will also change the calibration of the nodule and it may be necessary to reset the calibration value.

Then measure at the darkest part of the motif that still has a drawing. The value that now appears in the display (8) is also noted.

If you now divide the value of the darkest point by the value of the lightest point, you get a so-called

#### CONTRAST AVERAGE

Example: Value when measuring the brightest 2  
Value when measuring the darkest spot : 7  
 $7 : 2 = 3,5$

The contrast PJ ttel value is therefore 3.5 in this case.

The table below shows which paper gradation best corresponds to the average contrast values of the film original:

Average contrast value of the film approx:	Paper Gradation	Contrast average value of the package, for example:
	EU 0	30
30	x 1	20
17	Sp 2	12
10	N 3	8
5,5	H 4	5
3,5	EH 5	3
2		

#### Designation of the operating elements:

- |                         |                         |
|-------------------------|-------------------------|
| 1. eetschafter          | 12. Signalgeber         |
| 2. Device protection    | 13. Legatv/Sides switch |
| 3. New cable connection | 14. Slope/linear switch |
| 4. Steckd. f. 1arger    | 15. EichValue buttons   |
| 5. Mepkabelanschlu6     | 16. ANALYSIS button     |
| 6. Savings              | 17. HOLD button         |
| 7. Color star display   | 18. RFADY button        |
| 8. Digitalanzeige       | 19. EXPOSE button       |
| 9. Nodul shaft          | 20. TII4E button        |
| 10. Show t-Xahlscheibe  | 21. Function displays   |
| 11. Zeibereich switch   |                         |

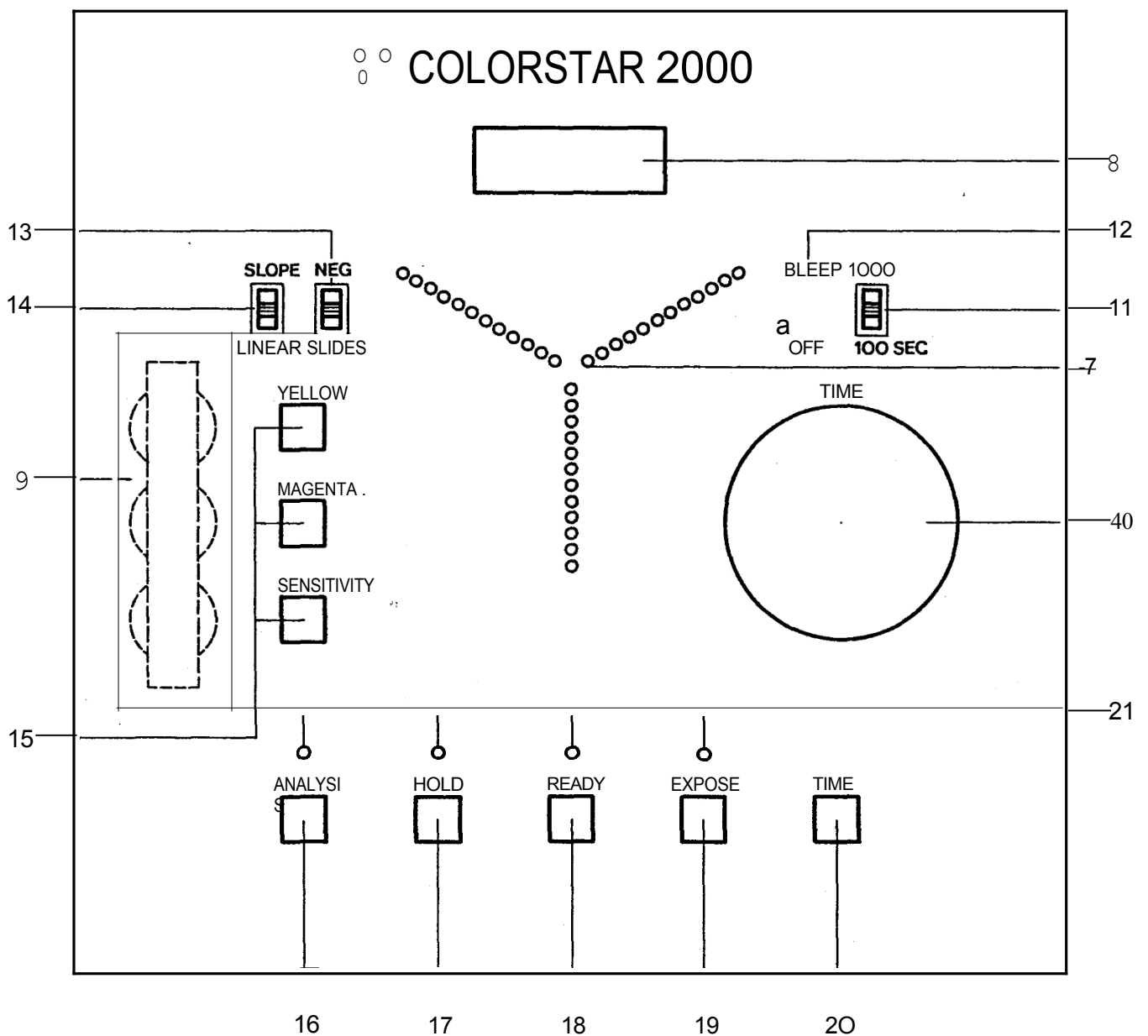
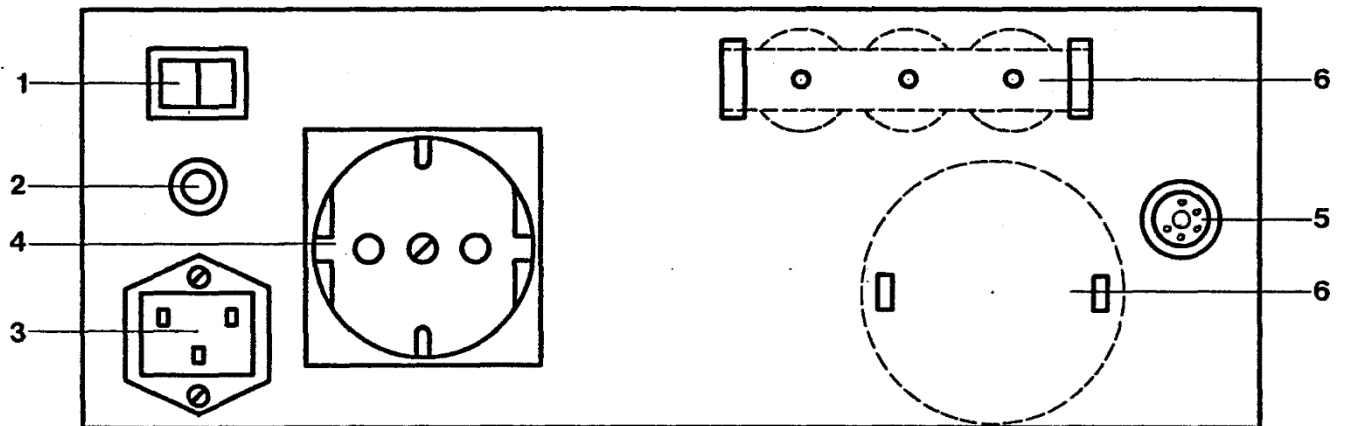
## BRIEF INSTRUCTIONS FOR WORKING WITH THE JOBO COLOR STAR 2000

- 1.) Connect the device, adapt the probe and allow the device to warm up for a few minutes.
- 2.) The data on the enclosed table for SchWarzschi 1dverhal t 1 near/slope , (Y) , (8) and (S) paper sensitivity to the COLOR STAR ei nput.
- 3.) Insert the tes tnegat1 v 1 into the image stage. Switch on the enlarger with the "hold" button (17), set "CHROME" (slide) or "NEG" (negative) on switch 13 according to the material used.  
Position the measuring head with the attachment for partial integral measurement on the base board. Press button 16 "ANALYSE" and extinguish the color star with two filter colors.
- 4) Press button 18 "READY". Enlarger switches off.  
Remove the measuring head. Insert paper and report "EXPOSE" by pressing button 19.
- 5.) After decoloring the sample, check the color balance and the brightness of the sample.
- 6.) Correction of the exposure time: If the B11d is too dark from the üegati v (too light from the Di a ), the S-reg1er must be set to a higher Xert. (30 units correspond to one B1end. )
- 7.) Color correction: Note for negative filtering:  
"What shouldn't be in the picture, I put in as a filter."  
(Reverse for slide filtering.)

Table for removing the residual ink stain:

Enlargement of negativeis to:	purple	blue	blue-green	green	yellow	red
Enlargement of slide to :	green	yellow	red	purple	blue	blue-green
Fi 1 tering magenta:	+	0	-	-	0	+
Filtering yellow:	0	-	-	0	+	+

- 8.) If the sample is correct in brightness and color, place the measuring head on the base board, set to "ANALYSE" and turn the Y and M controls until the LEDs in the color star of the COLOR STAR go out.  
The calibration is now complete. The values found for S, Y and M are noted on the paper pack and are valid for all work with this paper in conjunction with the partial integration measuring method.
- 9.) Any negative can now be inserted. Place the measuring head and press "ANALYSE". ow just turn the fi1ter color on the co1or head until the COLOR STAR is displayed on the LED star, until the LEDs go out. All givens, such as magni1fica1on tabs, BAnd, fi 1 terfactors, black shadows, light intensity, dark nega1ve, etc., are automatically adjusted. are calculated automatically.





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