

# Durst Laborator

*Gianette Tortona*

# 1000

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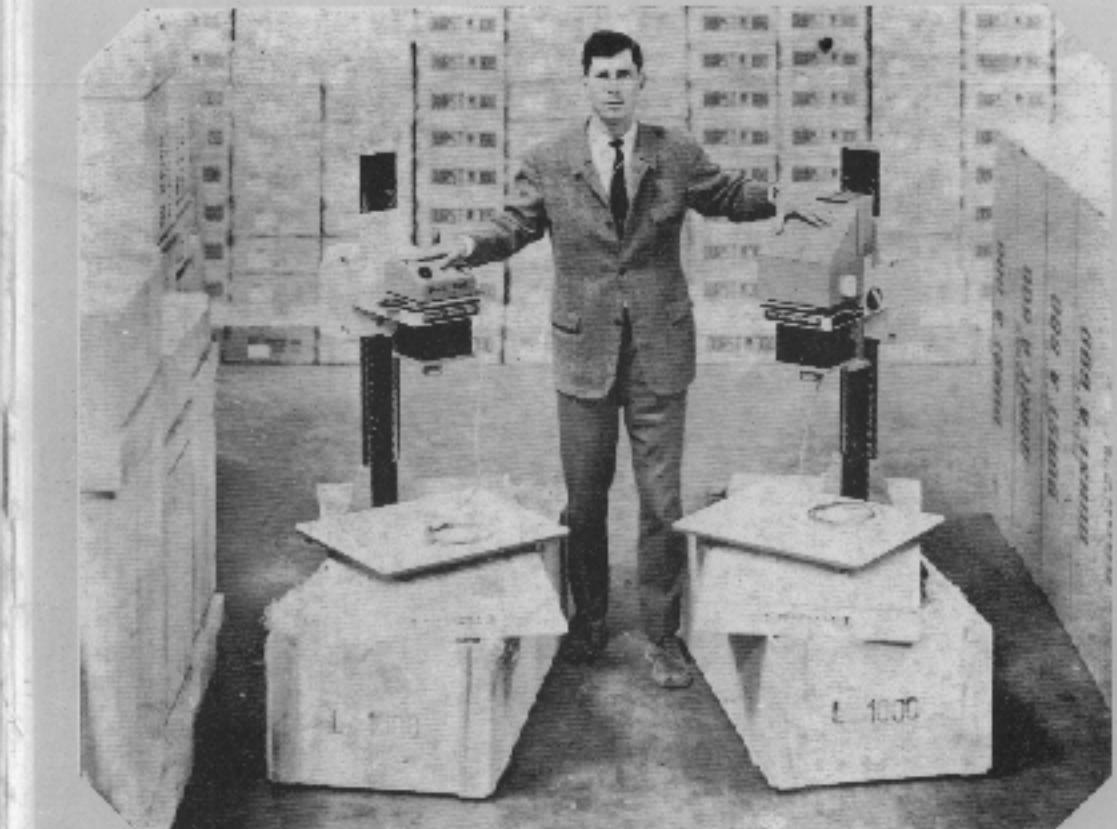
## Directions for Use

Durst Inc.  
Phototechnical Equipment  
Bolzano - Hamburg - New York



Durst Inc.  
P. O. Box 445 - 39100 Bolzano/Italy

24x36 mm  
100x125 mm



## Specification of Components and Operating Controls

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## DURST LABORATOR 1000

Precision professional enlarger for all negative formats up to 4 x 5" (10 x 12.5 cm) with manual focussing

In purchasing the DURST LABORATOR 1000 you have demonstrated your confidence in our equipment. We are very grateful for this. At the same time we feel it our duty to help and advise you as completely as possible so that you may obtain full use of the extreme versatility of your DURST LABORATOR 1000. The effortless operation and perfect function of this high capacity enlarger ensure you many years of undisturbed pleasure in your darkroom work.

This manual gives you step by step instructions on the assembly and operation of your DURST enlarger. It is definitely important to read it to learn quickly all of the functions and operating controls of your new enlarger, in order to avoid unintentional damage which could affect your guarantee rights.

We thank you  
for your  
confidence

## Packing

The enlarger comes packed in a case and dismantled into the following components:

1. Column (1) with guice sleeve (2) and stage (3);
2. Base (4) with mounted base board (5);
3. OTONEG negative carrier (6) with two planocarell pressure glasses.

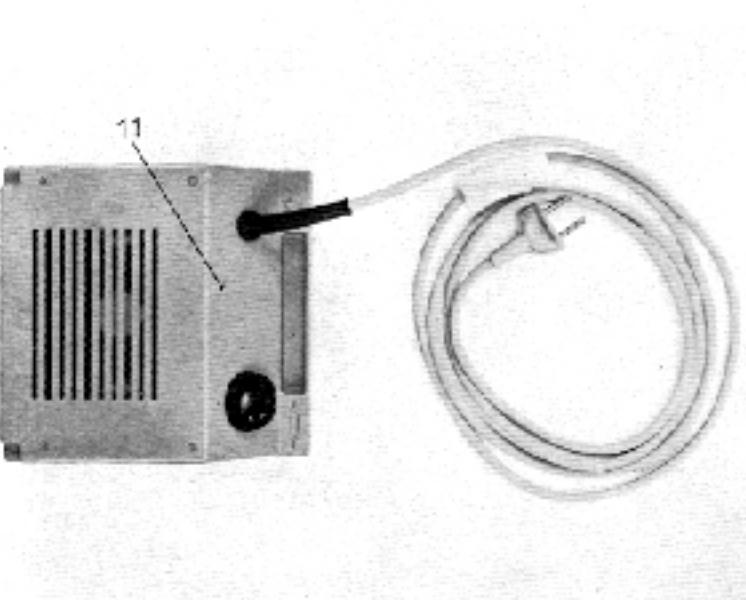
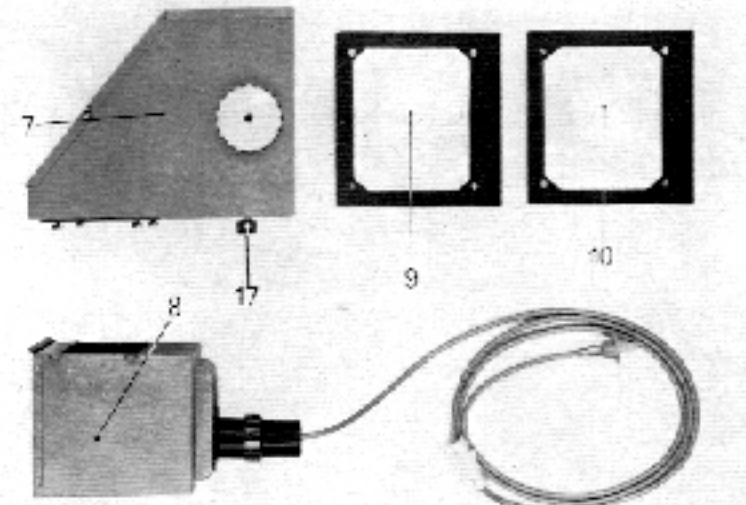
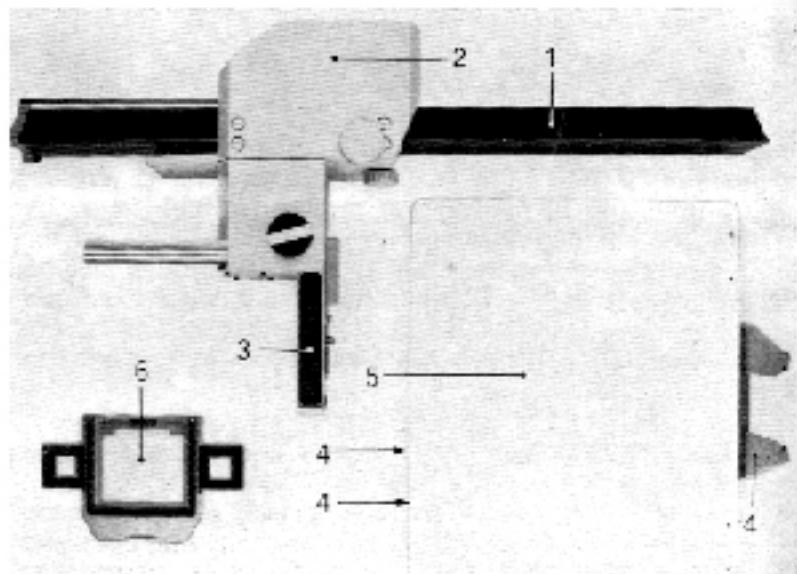
According to the type of unit ordered, the following components are also included:

- a) **DURST LABORATOR 1000 for condenser illumination:**  
TAUCAP condenser housing (7)  
TAULIC lamp house (8)  
2 half condensers (OTOCON 180/1 (9) and OTOCON 180/2 (10)).

- b) **DURST LABORATOR 1000 for cold-light:**  
TAUCOLI cold-light unit.

While unpacking, make certain that you grasp the unit by the column and never by the steel band.

First remove from all parts the dust caused by the packing material and clean the lenses, condensers, and negative carrier glasses with a soft brush or lint-free cloth.



## Assembly

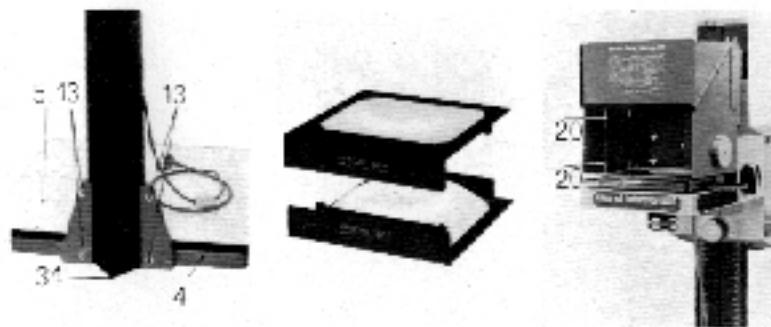
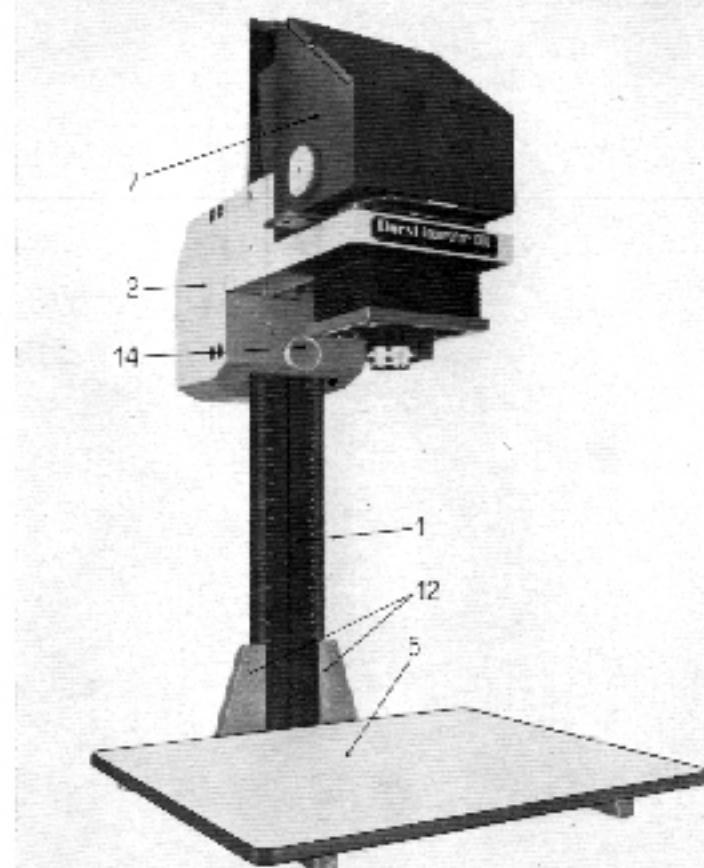
The base (4) with mounted base board (5) is placed upon the floor and the column (1) is inserted into the two clamping jaws (12) at the rear of the base (4). Make certain that the column (1) is inserted as far as the stop, then tighten evenly with the four hexagonal screws (13).

At the lower end of the column there is a leveling screw (34). Turn it outwards until it rests on the table on which the apparatus is put, ensuring a firm stand to the enlarger.

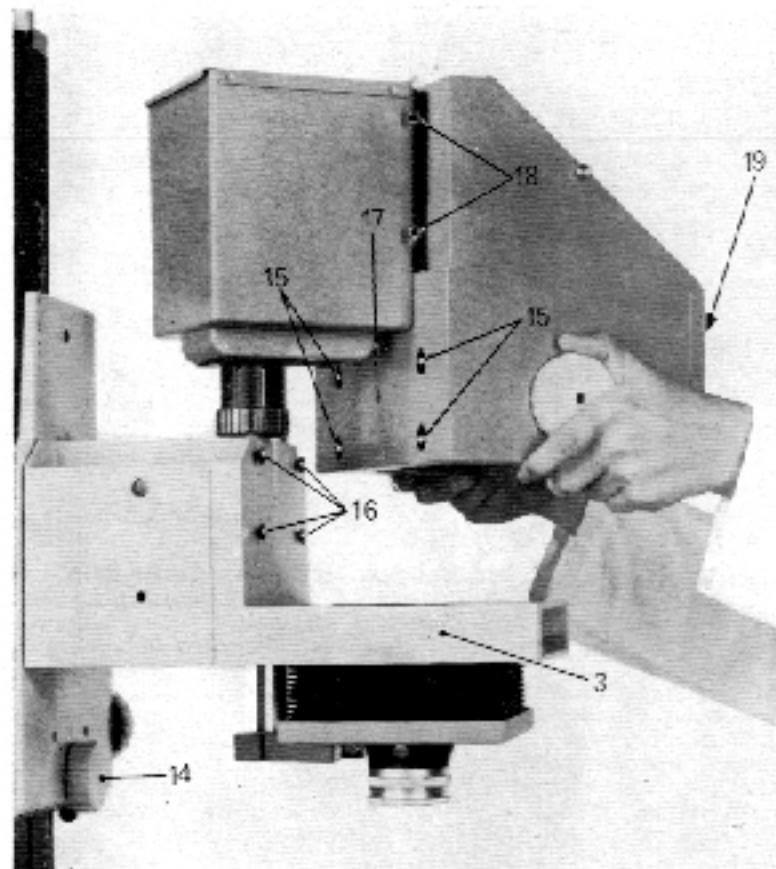
The locking knob (14) for the guide sleeve (2) is not to be loosened until the assembly is complete!

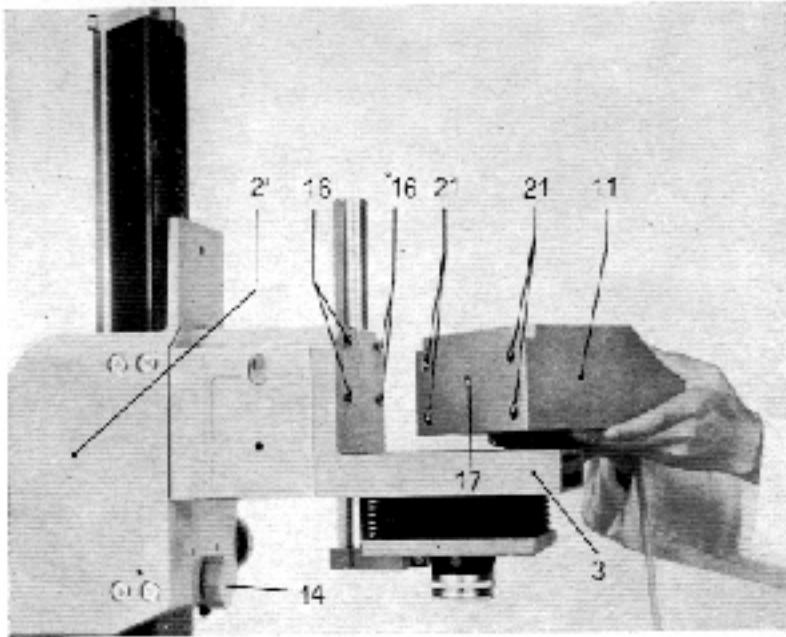
- If the DURST LABORATOR 1000 is ordered for condenser illumination:

The TAUICAP condenser housing (7) is suspended with its four holes (15) at the rear from the four hexagonal bolts (16) of the stage (3) and locked by means of the locking knob (17). At the rear of the condenser housing (7) the TAULIC lamp house (8) is



fastened by means of the four knurled screws with slot (18). Now the two standard condensers OTOCON 180/1 (9) and OTOCON 180/2 (10) can be inserted by lifting the lid (19) and sliding them in their guides (120) with the convex sides facing each other, the OTOCON 180/1 (9) to be inserted above and the OTOCON 180/2 (10) below. Now you may loosen the locking knob (14) for the guide sleeve (2).





b) If the DURST LABORATOR 1000 is ordered for cold-light:

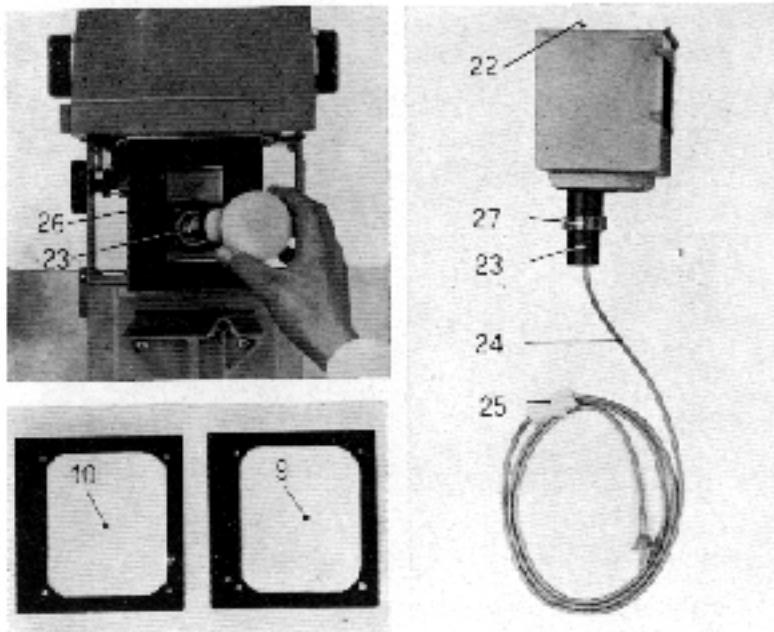
The TAUCCOLI cold-light unit is suspended with the four holes (21) at the rear from the four hexagonal bolts (16) of the stage (3) and locked by means of the locking knob (17). Now you may loosen the locking knob (14) for the guide sleeve (2).

**Illumination  
(unit with  
condensers)**

After removal of the lamp house lid (22) screw the lamp into the socket of the lamp holder (23).

As a rule the best illumination for most negatives is obtained by the combination of an opal lamp and condensers. You can use opal lamps of up to 300 W; check the lamps before using them (possible glass defects or dark spots on the inner surface of the bulb may be detected by holding the lamp up against a strong light). During current fluctuations and long use combustion deposits are formed which lead to uneven illumination; for this reason check the lamp from time to time.

Opal lamps which have burned longer than 50 hours are no longer suitable for colour work. When using the two standard condensers (3-10) we recommend the use of opal lamps with a minimum diameter of 29/16" (65 mm); the ideal diameter is about 4" (100 mm). We supply large-halogen lamps (code word OPALL) for 200 and 300 W. In the DURST LABORATOR 1000 you can also use projection lamps. These are especially suitable for enlarging line copy negatives where maximum sharpness and definition of details is wanted. If such lamps are used, however, you must work with open diaphragm. Connect the cable (24) coming from the enlarger head with plug and switch to the mains. Do not allow the lamp to burn needlessly: expose only with the switch (25) or with an exposure timer connected between the cable and the mains.

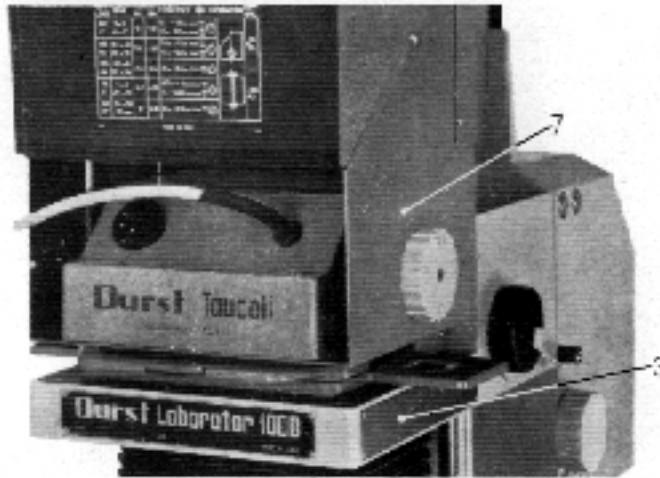


For lamps of over 250 W the LAFAN cooling blower (see Accessories) available separately, is indispensable. Insert the blower hose, after removal of the cover sheet (26) in the right-hand side of the lamp house, into the opening given free by removal of the cover sheet. The lamp is centred by moving the lamp holder (23) forwards and backwards, and, after loosening the clamping ring (21), also upwards. To find the best position for the incandescent filament, the socket of the lamp holder (23) can be turned to the right or left. For centring the lamp you previously must focus with a lens of middle or long focal length with open diaphragm.

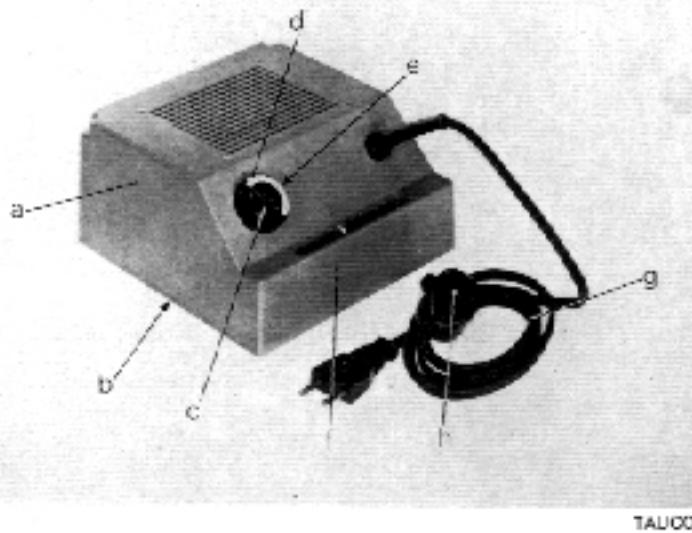
If you also have the accessories for condenser illumination, it is not necessary to remove the condenser housing to use the TAUCCOLI cold-light unit.

Lock the enlarger head by means of the locking knob (14), slide both condensers out of the condenser housing (7). Then slide in the TAUCCOLI unit in the housing as far as the stop. Now you may again release the locking knob (14).

With its diffusion soft type lighting the TAUCCOLI cold-light unit is mainly suitable for the enlargement of hard black & white negatives of all formats up to 9x12 cm or 4x5", but it is also suitable for all other fields in black & white photography. Its high light output allows short exposure times even with extremely dense negatives or slow paper. The special character of its light subdues scratches and impurities on the negative, thus making retouching work virtually unnecessary.



The TAUCOLI unit consists of a light metal pressure-cast housing (a) in which a cold-cathode tube is located between the mirror and the opal glass (b). This is fed from a built-in high tension transformer. On the front left-hand side is the current selector (c) with a fuse. The cold-light unit may only be used with A.C., 45 to 60 cycles, and is available in models either for the currents 125-160-210 V or 110-220-240 V. With each cold-light unit four Ø 5x20 mm type FN 1 fuses are delivered: two 1.25 Amp for mains currents of 220 and 240 V, and two 1.5 Amp for mains currents of from 110 to 160 V. The TAUCOLI is set at the factory for the in each case highest voltage and is therefore fitted with a 1.25 Amp fuse which is located in the corresponding opening near the current selector. The remaining three fuses are enclosed bulk.



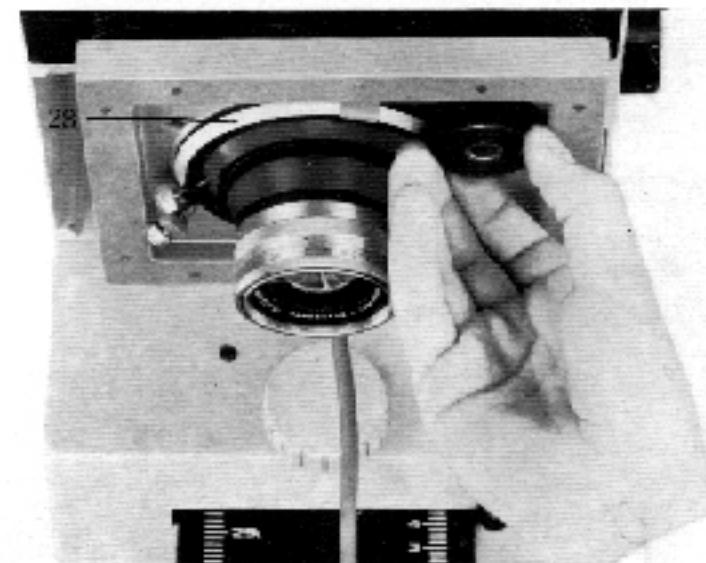
TAUCOLI

For other currents, please mount the correct fuse and reverse the current selector before using the unit!

To do this, turn the current selector (c) until the "x 0" setting matches with the white index mark (d) at the edge.

**Attention:** At the zero setting the fuse is automatically ejected from the opening (e) provided to the right of the current selector. Now insert the correct fuse (by pushing it completely in) and, at the same time, turn the current selector until the correct voltage number matches with the white index mark (d) at the edge. If needed, spare fuses are available at every electric shop. Now the TAUCOLI cold-light unit is ready for use. Grasp the TAUCOLI unit at the aperture provided for this purpose (f) and slide it, after having removed the condensers, into the enlarger head as far as the stop or fasten it to the stage (3) as described under "Assembly". Now you can connect the TAUCOLI cable (g) to the mains either directly or with an intermediate exposure timer. If the TAUCOLI is connected directly, expose by turning the switch (h) on and off or by means of the orange filter, which is mounted in the swivel-mount upon the connection ring (28) in place of the red filter, when the cold-light unit is used, to allow better observation of the projection picture and easier centring of the enlarger paper. To compensate for the unavoidable marginal fall-off which every lens has, always stop down one or two values.

The TAUCOLI flickers at the beginning and gives a constant light only after it has burned for 10-15 seconds. The maximum light output is attained only after the unit has warmed up for 4 to 5 minutes; then it can be switched on and off as desired. After longer pauses it is necessary to warm the unit up again for 4 to 5 minutes. It is advisable to use the TAUCOLI cold-light unit together with a voltage



stabilizer, as only then a constant light output is ensured, especially during quite long exposures. For this purpose the DURST STABI voltage stabilizers are particularly suitable (see Accessories).

If the cold-cathode tube breaks or shows black spots after long use so that an even illumination is no longer possible, please send the TAUCOLI unit for repair to the nearest DURST general agency.

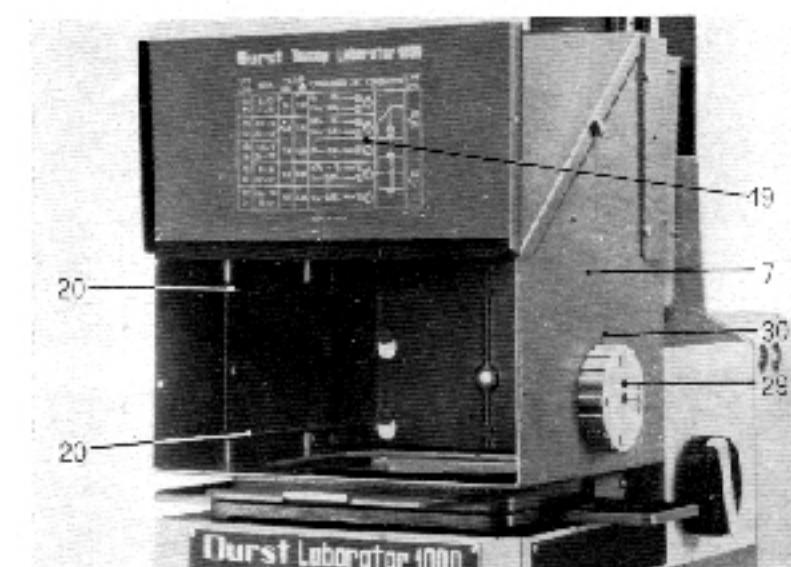
#### Condensers

If ordered with condensers, the apparatus is standard equipped with two condensers (one OTOCON 130/1 and one OTOCON 180/2). The condensers are fitted with their own mountings and are slid in their guides (20) with their convex sides facing each other.

In addition to the two OTOCON 130/1 and OTOCON 180/2 standard delivered condensers, the OTOCON 130 and OTOCON 30 extra condensers are needed for lenses of shorter focal lengths. The exact data for the use of these additional condensers can be learned from the following printed table which is also attached to the inner side of the condenser lid (19).

In order to attain each time the best possible illumination, the condensers must be vertically adjusted by means of the knobs (29) located on both sides of the housing (7).

Three adjustments are possible, which are indicated on the knobs (29) with one, two and three squares. While adjusting the knobs (29) in each case click in exactly at the position which in addition is indicated by the index mark (30). For the required position of the various condenser combinations also see the above-mentioned table.



Condenser combinations table

Lens mm inches	Max. film format size index	Magnif. factor max. min.		Condenser positions	Opt. comp. Q3
150 6"	10 x 12.5 4 x 5"	5 - 1.5 x	180 - 1 180 - 2		
		1.5 - 0.9 x	180 - 1 180 - 1		
135 5 1/4"	8.5 x 10 3 1/4 x 4 1/4"	5.8 - 1.5 x	180 - 1 180 - 2		
		1.5 - 0.8 x	180 - 1 180 - 1		
105 4 1/8"	6.5 x 9 2 1/2 x 3 1/2"	7.8 - 0.6 x	180 - 2 180 - 1		
75 3"	5 x 6 2 1/4 x 2 1/4"	11.7 - 1 x	180 - 2 180 180 - 1 180		
		1 - 0.35 x			
50 2"	24 x 36 mm 35 mm	19 - 3.35 x	180 - 2 50		

From > 1/2" (18 mm)  
up to 4" (100 mm)

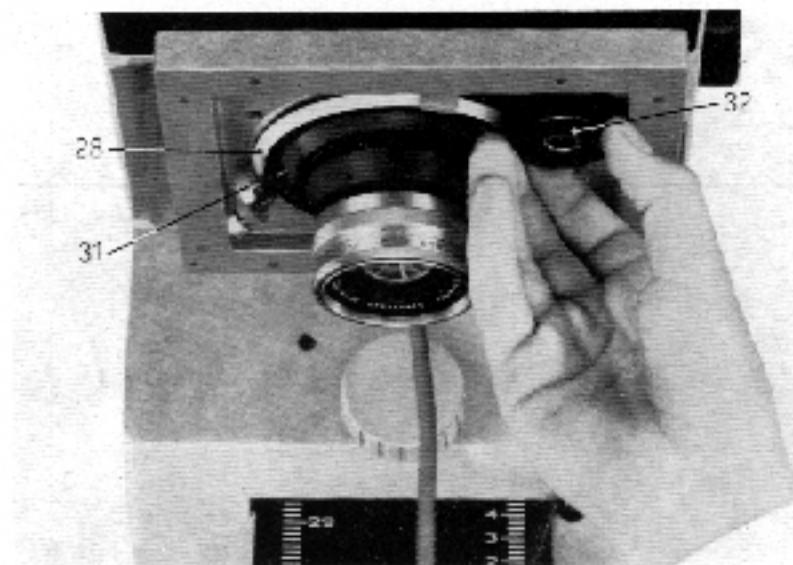
## Lenses

The inserting or removal of the lenses mounted upon corresponding lens boards is carried out by loosening the knurled screw (31) at the connection ring (28).

Lenses of from 75 up to 150 mm lens focal length are mounted in the LAPLA flat lens boards. Our SCHNEIDER-DURST-COMPONON lenses with lens focal lengths of 150 and 125 mm, already provided with the required connection tube, can be directly inserted into the connection ring (28). 50 mm lenses, however, are screwed into the SCPLA 105 lens board, available separately.

## Connection ring

To check the definition or the picture section once more when the enlarging paper is in place, swing in the filter loaded swivel-mount mounted upon the connection ring (28) by means of the knurled wheel grip (32) into the path of beams (if condenser illumination is used the filter is red, in connection with the cold-light source the filter is orange).

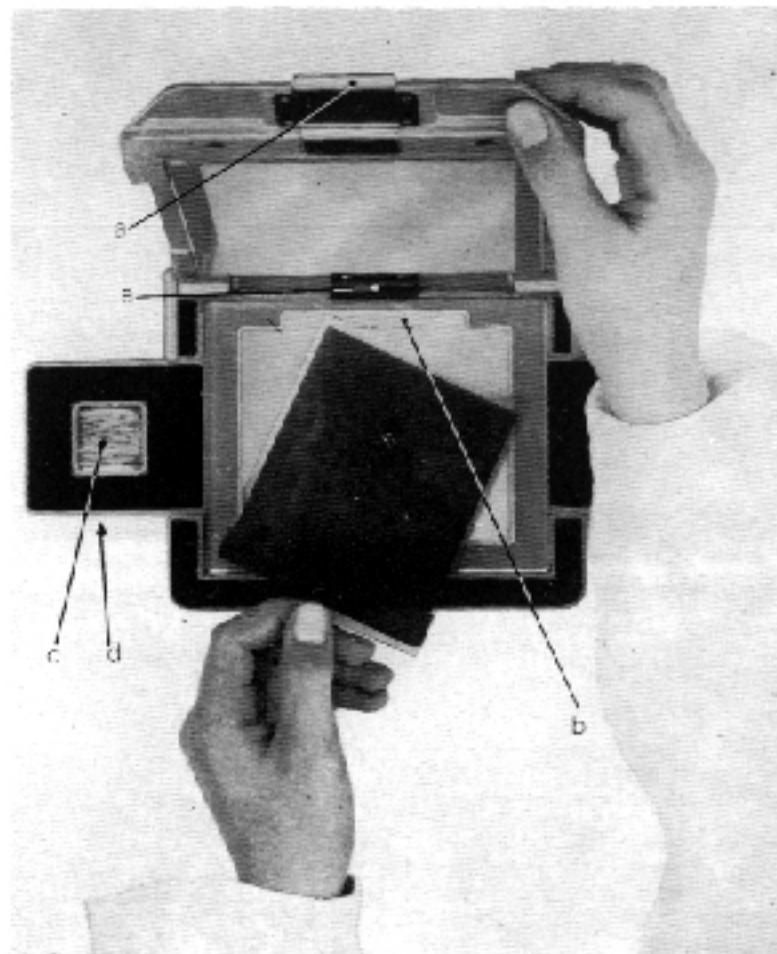


## OTONEG negative carrier

The DURST LABORATOR 1000 is delivered with the OTONEG negative carrier (6) as standard equipment, in which films and plates of up to 9 x 12 cm or 4 x 5' can be enlarged. The OTONEG consists of a frame upon which a hinged upper section is mounted. In each the frame and the upper section a planeparallel pressure glass is mounted. The glass plates are mounted in the negative carrier by pressing or stretching the spring-mounted clamping bars (a). Make certain that the glass plates are mounted with the bevelled edges facing each other to avoid scratched negatives. To avoid Newton rings the upper OTONEG pressure glass (OTOGLAS) is available on request with an anti-Newton rings coating (OTOGLAS AN).

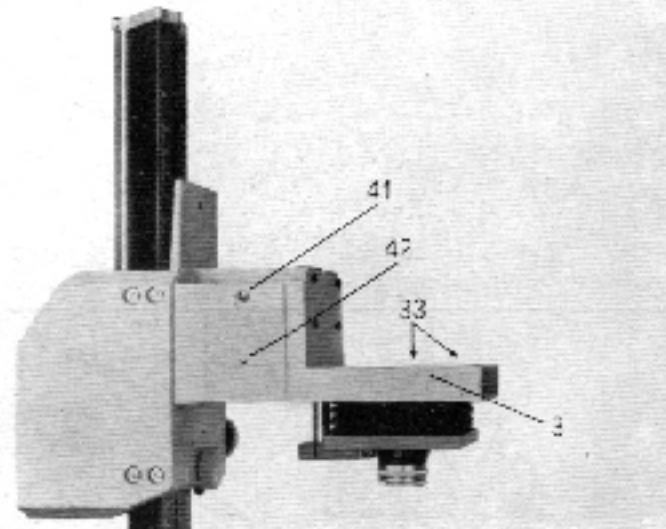
To insert the negatives, remove the negative carrier from the enlarger head and tilt back the upper section. Then bring the upper section forwards again. The negative now is pressed flat between the two glass plates. The hinged upper section is spring-mounted and is pressed against the lower frame of the negative carrier when the carrier is slid into the enlarger head. In the OTONEG negative carrier you can also enlarge uncut films of up to 2 1/2 x 3 1/2" (6.5 x 8 cm) (incl. 70 mm). To advance the film strip lift the upper section which projects somewhat over the front of the enlarger head.

To mount a grey scale to a negative being enlarged, an opening (b) is provided at the rear of the negative carrier frame. To ensure that the negative can be brought quickly over the centre of the lens and that the negative carrier is seated firmly during horizontal projection, fixing holes (33) are provided in the stage (3). When sliding the negative carrier into the enlarger head, press the two springs (c) upon the underside of the negative carrier frame slightly upwards,



then release and push the negative carrier into the middle until the knobs (4) of the two springs (3) lock into the fixing holes (33) of the stage (3). For enlarging without glass, the OTOPPE metal masks are available separately in the most often used cm. and inch formats, and are mounted instead of the two glass plates (mask with pins below counter-mask with holes above) in the OTCONEG negative carrier. With these masks you can also work without danger with wet plates.

Besides for plates and sheet films, this pair of masks can also be used for roll film of up to  $2\frac{1}{4} \times 3\frac{1}{2}$  (6x9 cm) by turning over the lower mask.



**Height adjustment** For height adjustment the enlarger head is pushed up or down by grasping the stage (3). The fine adjustment is carried out by means of knob (36). The enlarger head, thanks to its excellent spring compensation, comes to a standstill in every height and can be locked in place by means of the locking knob (14). Focussing is done by wheel-grip (36). For quick adjustment this wheel-grip (36) is fitted with a swivel-mounted crank (37), whereas for fine adjustment the wheel-grip itself is used.

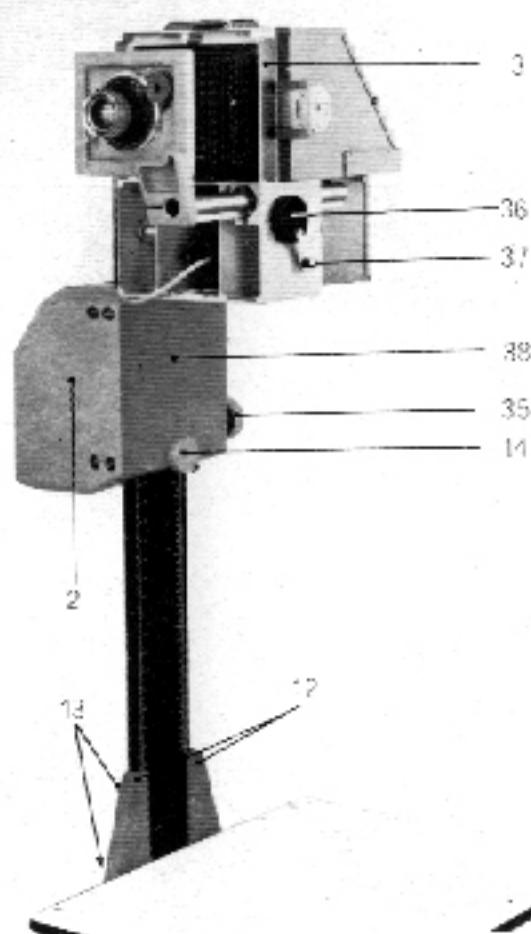
**Giant enlargement and horizontal projection** If the maximum enlargement upon the base board with the enlarger head in the lower position (38) of the guide sleeve (2) is insufficient, you can raise the enlarger head after having loosened the star knob (39) and lock it in the upper position (38). Before doing this, lock with the locking knob (14).

If the enlargement format upon the base board in that case also proves insufficient, you can project upon the floor. To do this, loosen the four hexagonal screws (13), turn the enlarger head with column 180° and remount it in the base (1). Do not forget to weight down

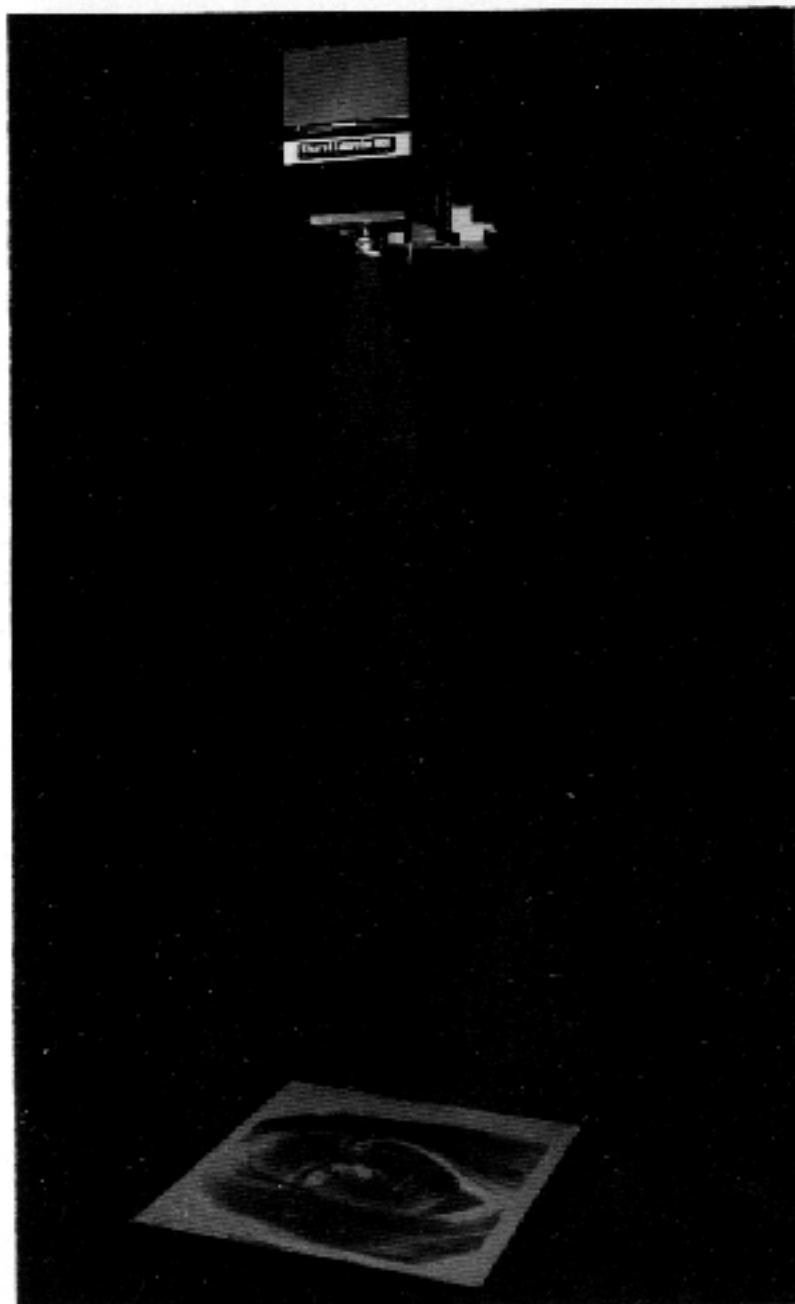
the base board first to prevent the enlarger from tilting over! Tighten the four hexagonal screws again.

In order to obtain even larger enlargements you can also bring the enlarger head into horizontal position and project onto the wall. Proceed as follows:

1. Lock the enlarger head by means of the locking knob (14) and remove the condensers, the negative carrier, and the lens.
2. Remove the enlarger head by loosening the star grip (39) from the guide sleeve (2), then remove the star grip (39) and the snap-in bolt (40). The latter is removed outwards by loosening the knob of the bolt itself.

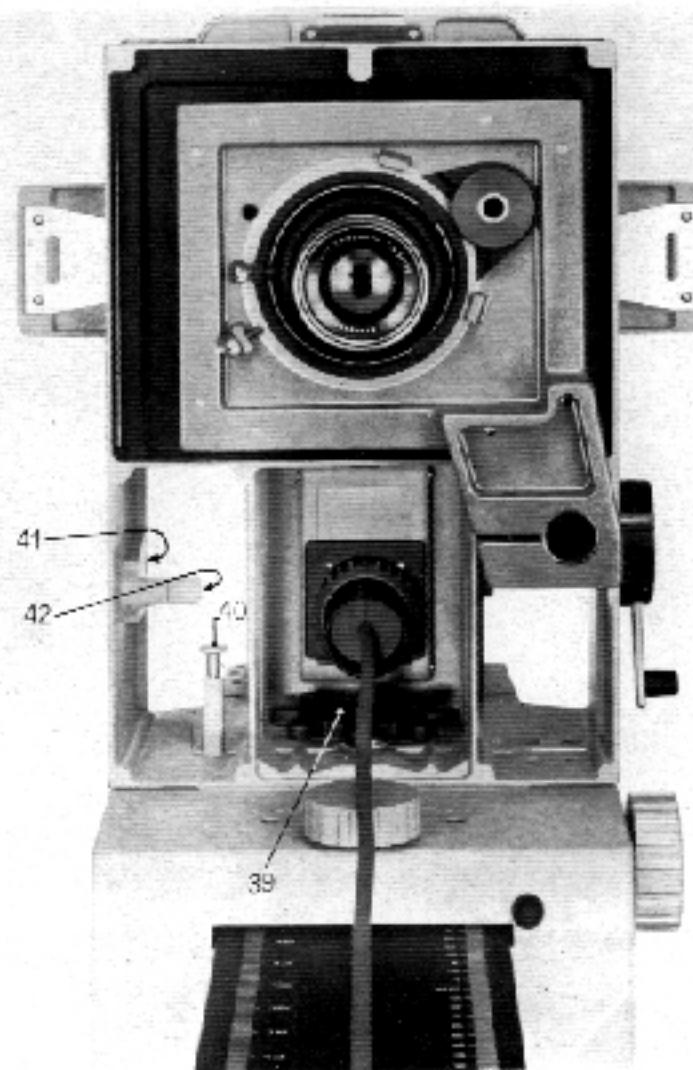


3. Mount both parts in the openings (41-42) provided on the left-hand side of the enlarger head. Now screw the enlarger head in the lower (38) or upper (39) position on the guide sleeve (2).



4. Tilt the enlarger head in the horizontal position and make certain that the bolt (40) rests in the centre hole of the three holes provided.
5. Mount the lens, and insert the negative carrier as well as the condensers. Release the locking knob (14).

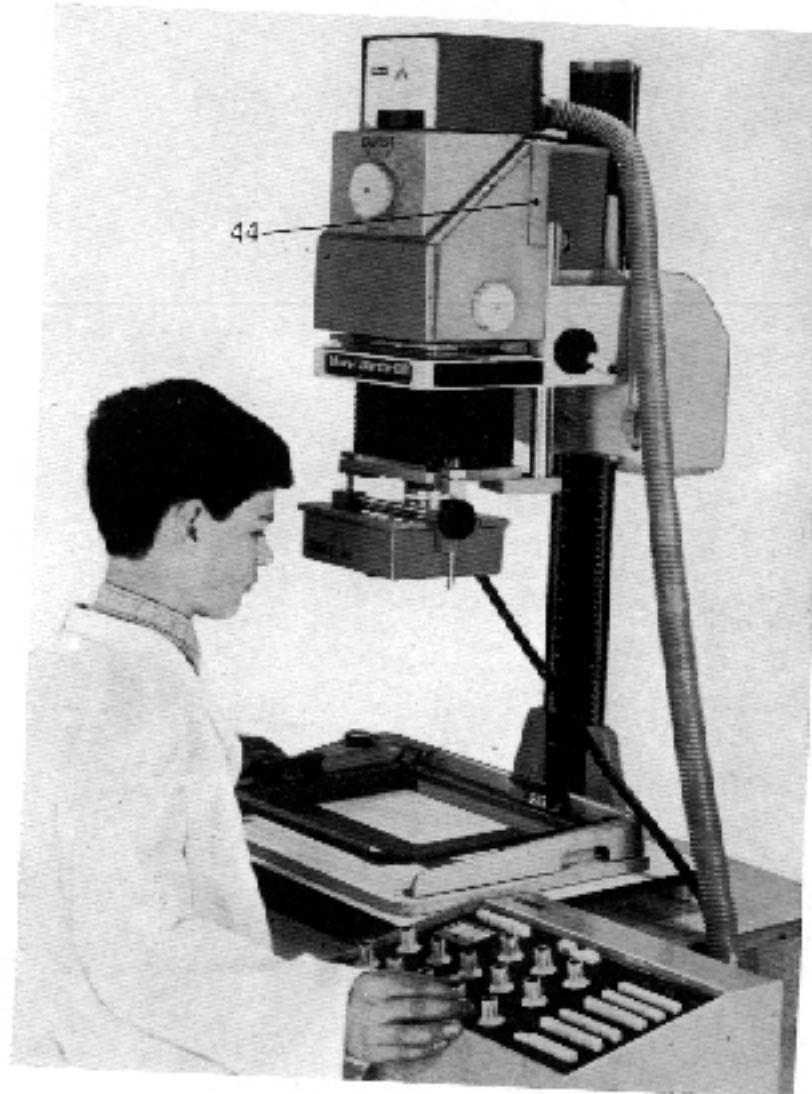
In this position the enlargement range is almost unlimited.



#### Colour enlargement

The TAUFILE colour filter drawer (43) is available separately. This is inserted into the opening created by loosening the two screws and removing the cover sheet (44). The drawer takes colour or gradation filters in  $4\frac{1}{4}''$  sq. [12 x 12 cm] format. Make certain that while centring the lens, the latter does not touch the filters.

For the production of colour enlargements according to the additive process the separately available TAUPORT filter unit is indispensable. For colour enlargement instructions please ask the manufacturer of the light sensitive material which you intend to use.

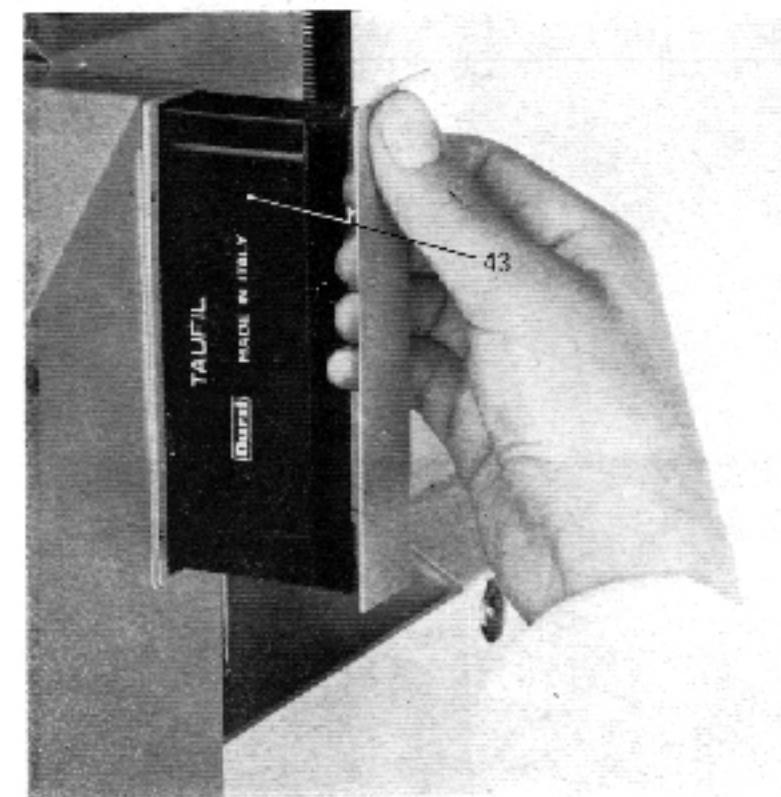


On the LABORATOR 1000 also the completely automatic DURST CCU 100 electronic colour control unit can be used which after calibration to the used colour paper allows to obtain from mostly all the negatives completely accurate colour copies by simply pressing a key. For this the separately available TAUFILE adapter (see under Accessories) is necessary by means of which the colour head of the CCU 100 colour control unit can be attached to the enlarger head of the LABORATOR 1000.

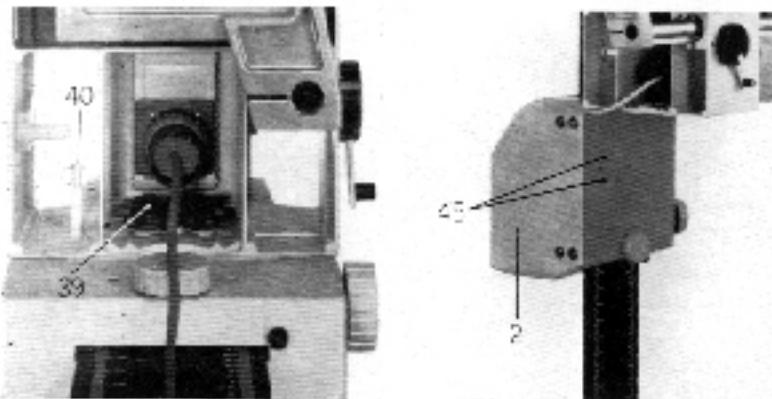
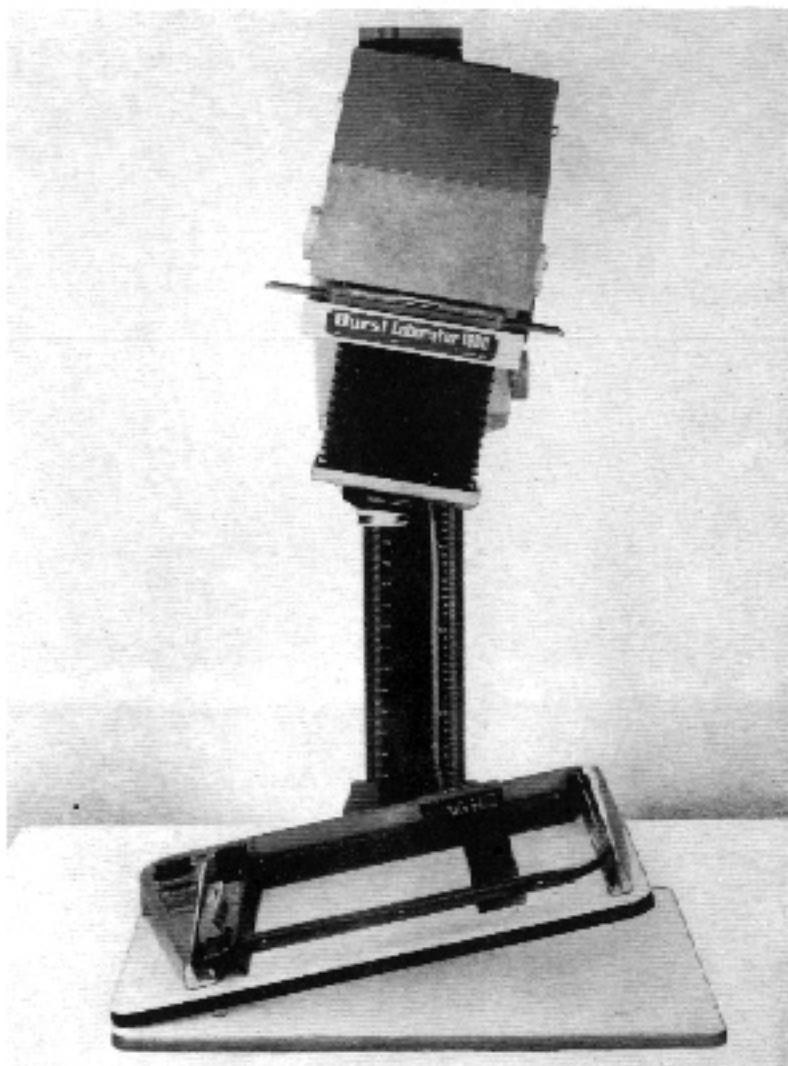
For reductions, select a lens with a focal length corresponding to the picture diagonal length of the desired reduction. For example: If a  $3\frac{1}{2} \times 4\frac{1}{4}''$  [9 x 12 cm] original is to be reduced to  $2\frac{1}{2} \times 3\frac{1}{4}''$  [6.5 x 9 cm], you need a focal length of 105 mm.

For stronger reductions the DUTUG II extension tube is available separately (see Accessories).

#### Reduction



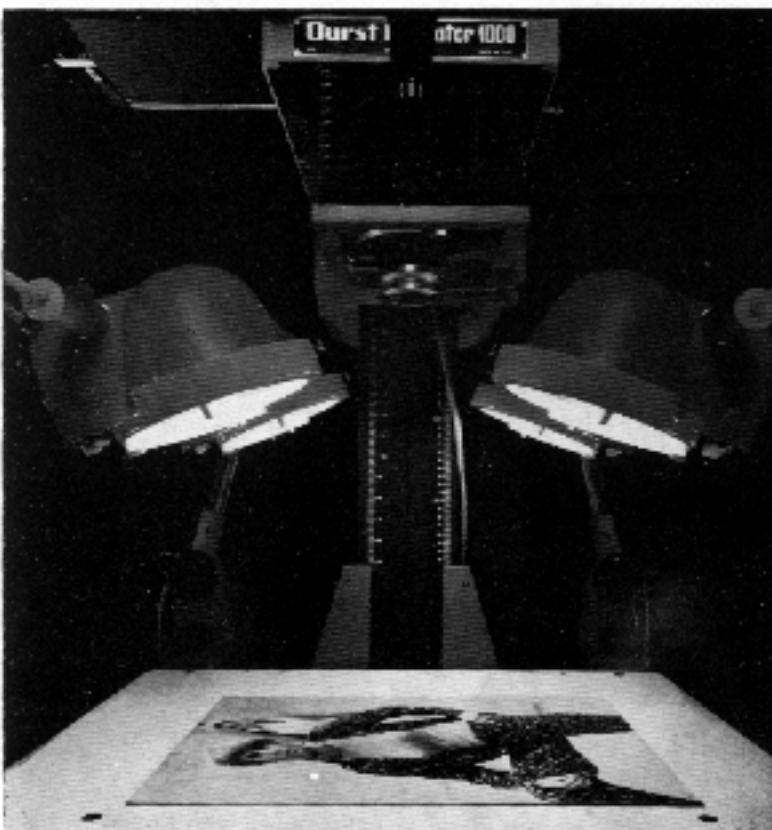
To correct converging lines the enlarger head can be tilted. To do this, loosen the star knob (39) and draw the snap-in bolt (40) out lightly. Now the enlarger head can be tilted to the left or right. The enlarger head can be locked in the desired position by means of the star knob (39). On the guide sleeve (2) are two further fixing holes (45) which serve as stops for extreme distortion correction. If this distortion correction possibility is not sufficient, you can also counter-tilt the enlarging easel based upon the base board. For complete distortion correction the TAUBA special lens board is available separately (see Accessories). In order to maintain the definition in the entire picture when the enlarger head is tilted, stop down the lens to increase the depth of field. If using the TAUBA distortion lens board, however, the principle is valid to tilt the three optical planes (the negative, lens and projection planes).

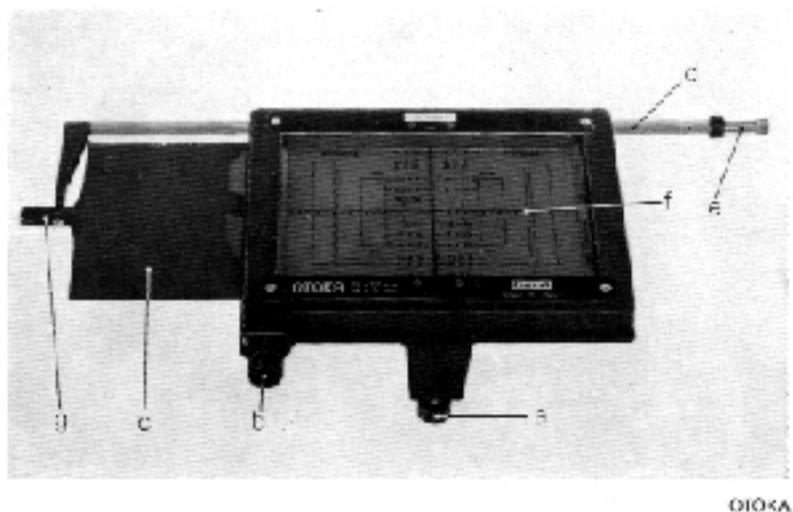


towards each other in such a manner that their imaginary straight lines meet at one point, and for that reason the picture is well-focussed over its entire surface, without having to stop down the diaphragm.

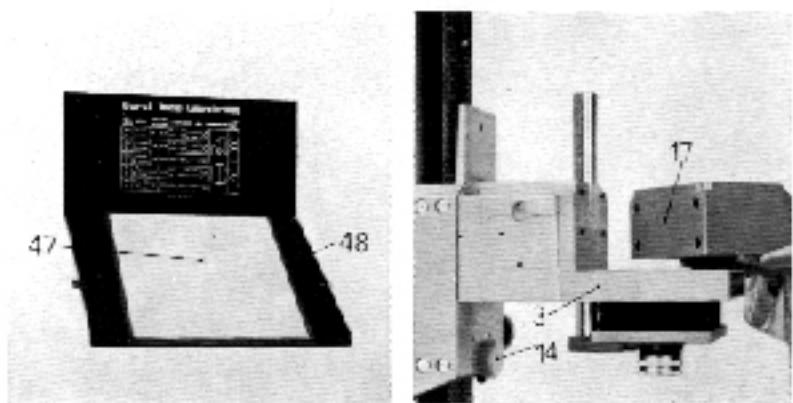
To use the LABORATOR 1000 as a copying unit the following accessories are necessary:

Copying





- 1 OTOKA copying cassette consisting of a closed frame and a ground glass screen. Plate and sheet film cassettes as well as reducing and sheet film inserts for the formats 4.5 x 6 cm, 5.5 x 9 cm, 9 x 12 cm, (1½ x 2¼", 2½ x 3½", 3½ x 4¾"), 3½ x 4½" and 4 x 5" are available as separate accessories.
- 2 RILU lighting unit for copying: it consists of two hard-chromium steel lamp supporting bars which are fastened to the rear of the base board by means of strong clamping sleeves. The height of the bars can be adjusted and locked by means of a locking knob. Upon each of the two bars are two individually switched reflectors for opal lamps of up to 150 W which can be slid sideways or tilted up and down. Each reflector is fitted with a light diffusing screen for even illumination of the original. By using colour or polarization filters instead of the light diffusing screens special effects can be obtained. The lamp supporting arms can be tilted backwards when not in use so that they do not interfere with enlarging work. The RILU lighting unit for copying can also be used with other copying or enlarging units. To mount the RILU unit upon the LABORATOR 1000 the two rear Philips head screws



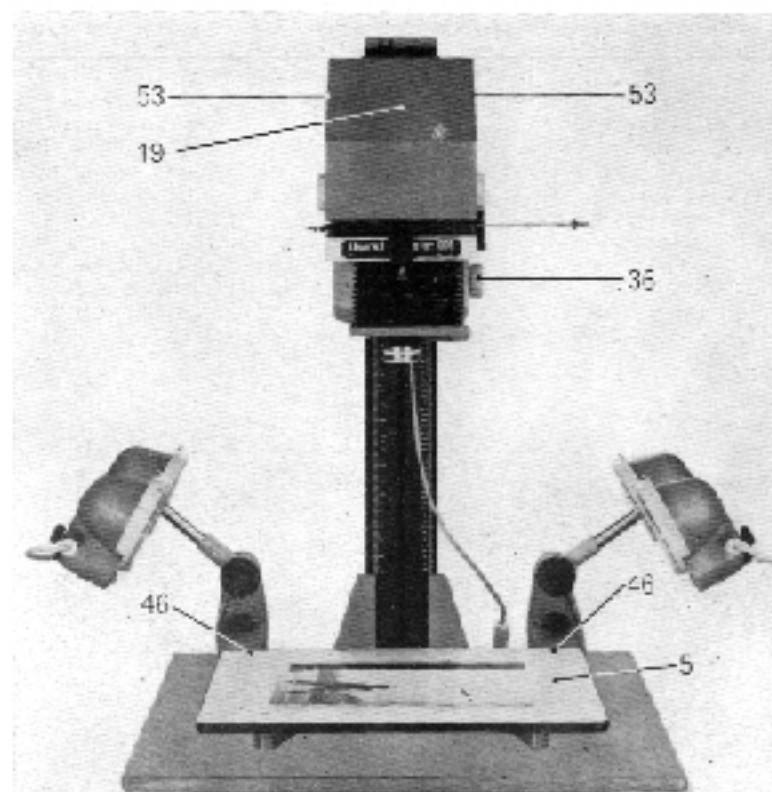
[46] are loosened from the base board [5]. Over each of the two now free holes you place the connecting jaws and fasten them with the two Philips head screws [46] and the two screws delivered with the RILU.

#### Mode of operation for copying

Slide the OTOKA copying cassette into the enlarger head until the stop in place of the negative carrier and lock it immovably with the locking screw [a].

Picture size and focus can be adjusted according to the two following methods:

- a) By mirror viewing: to do this, remove the condenser housing lid [19] after having loosened the two milled screws [50]. Grasp the lid at the upper end. Remove the mirror [47] from its housing without bearing off the rubber strip holding the mirror, and mount it with the mirror surface facing down in the guide notches [18]. Switch on the lighting unit for copying — the original and the format grid lines of the ground glass screen (f) are then visible

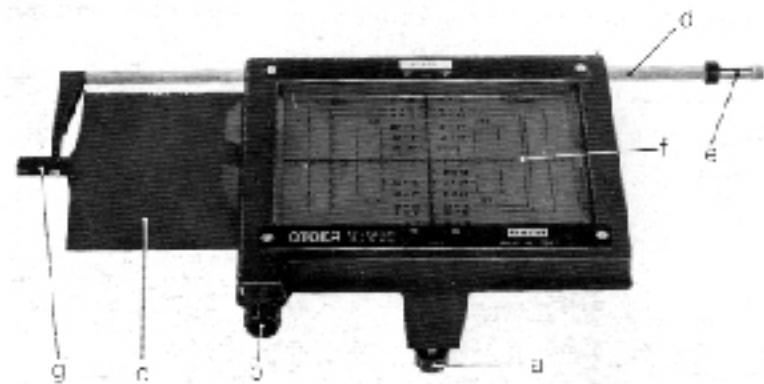


in the viewing mirror (7) — set the picture size by height adjustment of the enlarger head and focus by means of the wheel-grip (38). Seen from above, the original must be reflex-free (illuminated). In order to achieve maximum definition whilst copying, stop down well the lens (at best to  $f = 11$ ).

- By projection: to do this, switch on the lamp in the enlarger and project the format grid lines of the ground glass screen (f) upon the original to be copied. By adjusting the height of the enlarger head the format grid lines can be matched with the original. Then focus by means of the focusing wheel-grip (38).
- If your LABORATOR 1000 is not equipped with a condenser housing but only with a cold-light, in order to copy you focus as follows: lock the enlarger head with knob (14), remove the TAU-COLL cold-light unit by loosening the knob (17). Switch on the lighting unit for copying, the format and focus are set as described in paragraph «a», however, by viewing the ground glass screen (f) directly. Then loosen the locking knob (14), holding fast the stage (3) in order not to let it bound up (since by the removal of the cold-light unit the counterweight balance is discharged, which must be compensated by hand).

Copying is done as follows:

Slide the guide bar (d) at the knurled knob (e) as far as the left stop, mount the cassette (c) loaded with a suitable plate or sheet film — with the sliding drawer downwards — under the ground glass screen (f), hook the cassette (c) in the clamp (g) of the guide bar (d) and draw this as far as the right stop, whereby the cassette (c) is caught completely under the ground glass screen (f). As the dark slide must be withdrawn for exposure, the cassette itself (c) must be locked into place by turning the knurled knob (b) to the right. To open the cassette (c) the guide bar (d) is slid as far as the left stop. By turning the knurled knob (e) of the guide bar (d)



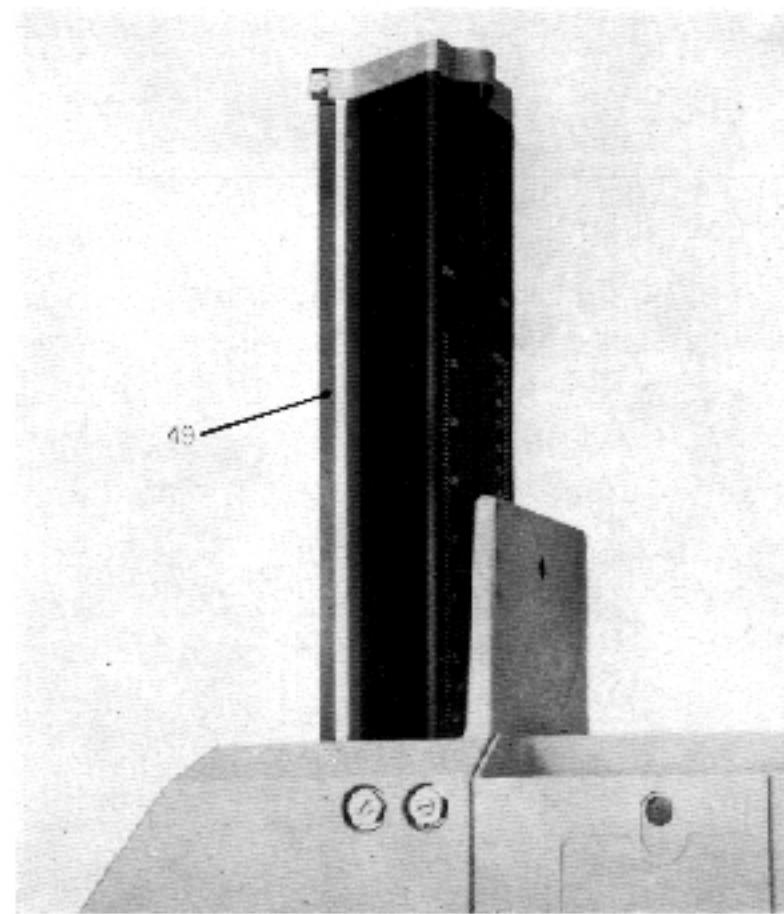
OTOKA

the opening travel of the dark slide can be regulated. Now you can expose by switching the lighting unit on and off. Then you draw the dark slide on the guide bar (d) back to the right. Turn the knurled knob (b) to the left and then also slide the guide bar (d) to the left. The closed cassette (c) is thereby drawn out of the frame and can be removed by pressing the clamp (g) together.

In addition to the OTOKA copying cassette, you can also use camera backs upon the LABORATOR 1000. For this purpose the separately available OTODAP adapter plate is necessary (see Accessories).

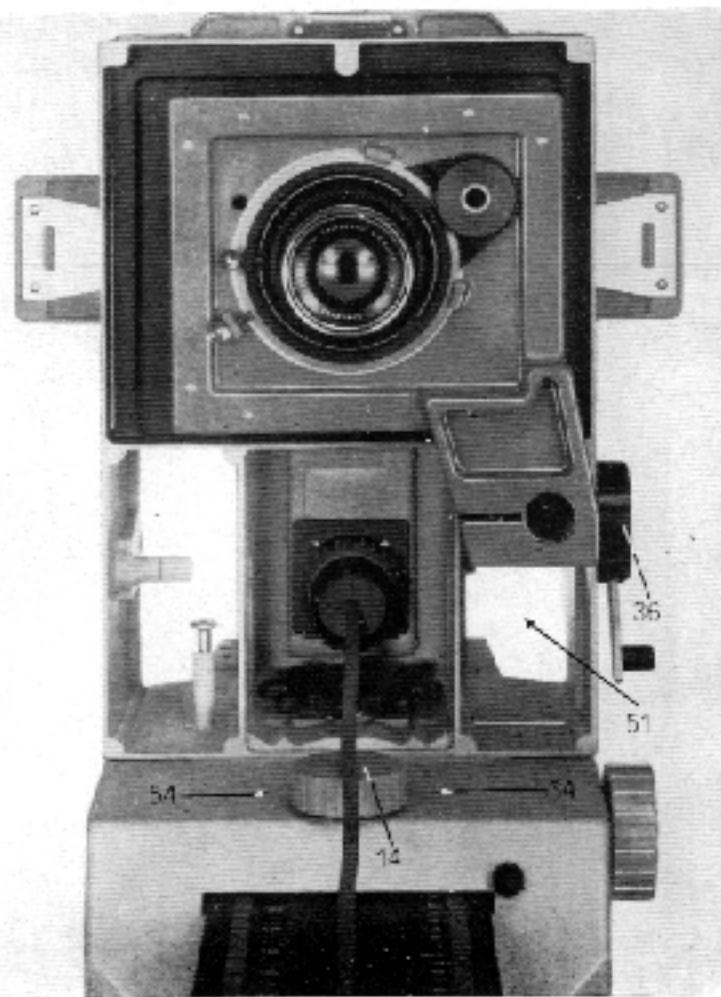
#### Maintenance

The DURSI LABORATOR 1000 is designed for maximum output and a minimum of care. This enlarger maintains its high capacity even under unfavourable working conditions. The only required maintenance

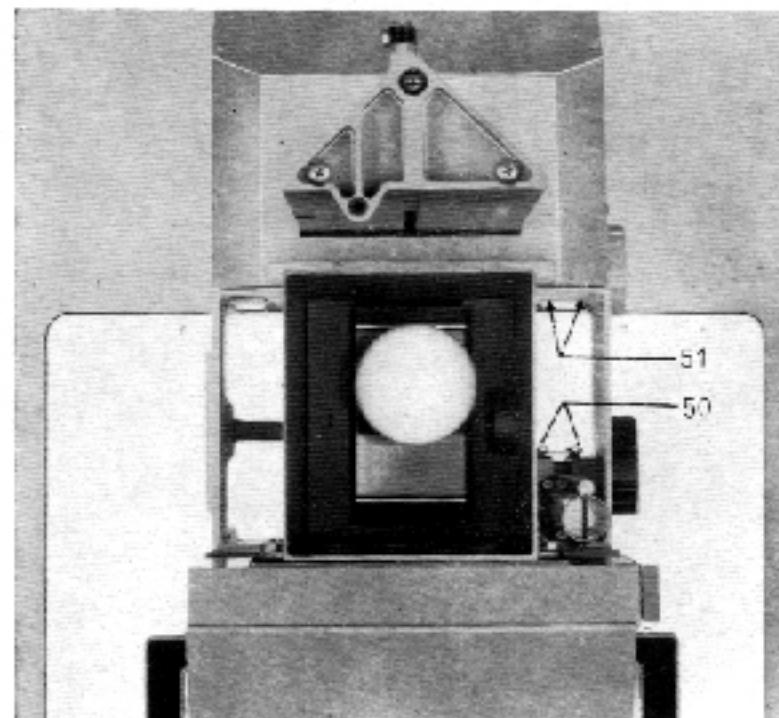


is that the steel band (49) be carefully wiped with an oily cloth from time to time. The glasses of the negative carrier, the condensers, and the mirror should be cleaned by means of a chamois leather or, even better, with an anti-static brush or cloth. All lenses are provided with an anti-reflex coating, for this reason clean carefully to avoid scratching.

The best protection for your LABORATOR 1000 against dust and dampness in the darkroom when not in use is the curable plastic AUTOCLIP protective hood which is available as a separate accessory (see Accessories). If the lens adjustment on the wheel-grip (36) no longer functions exactly after long use, simply tighten evenly the four screws (50) which are accessible through the apertures (51).



The friction drive for the vertical adjustment of the enlarger head can be adjusted by means of the two studs (54) on both sides of the locking knob (14).

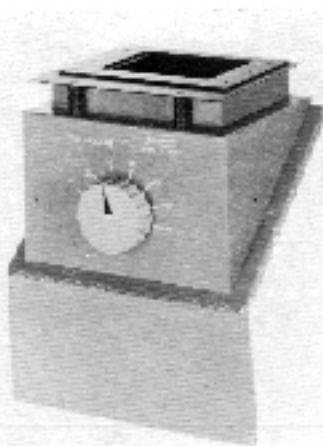


## Accessories

For colour enlargement the following accessories are available separately:

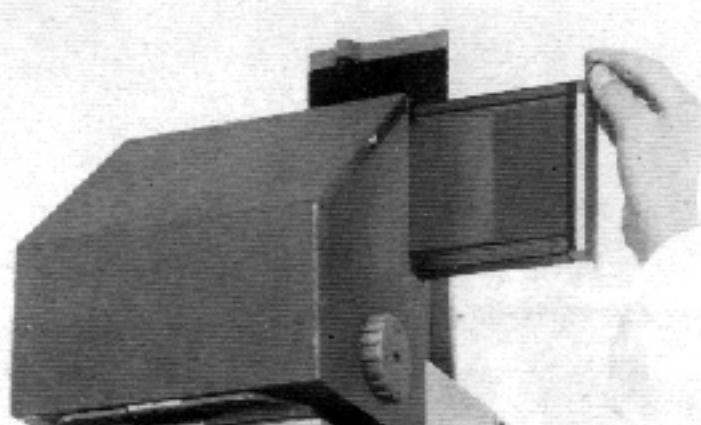
**TAUFARB  
Colour Head  
Adapter**

For the use of the completely automatic DURST CCU 100 electronic colour control unit on the DURST LABORATOR 1000 the TAUFARB colour head adapter is necessary by means of which the CLS 100 colour head of the CCU 100 colour control unit is attached to the LABORATOR 1000.

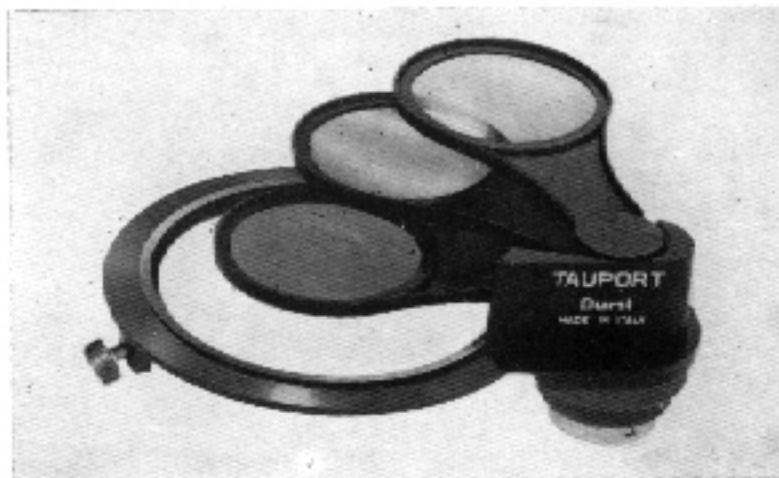


**TAUFIL  
Filter Drawer**

For colour enlargement with colour correcting filters the TAUFIL filter drawer (43) is suitable in which filters of 12 x 12 cm (4 3/4" sq.) format can be placed.



TAUFIL



TAUPORT

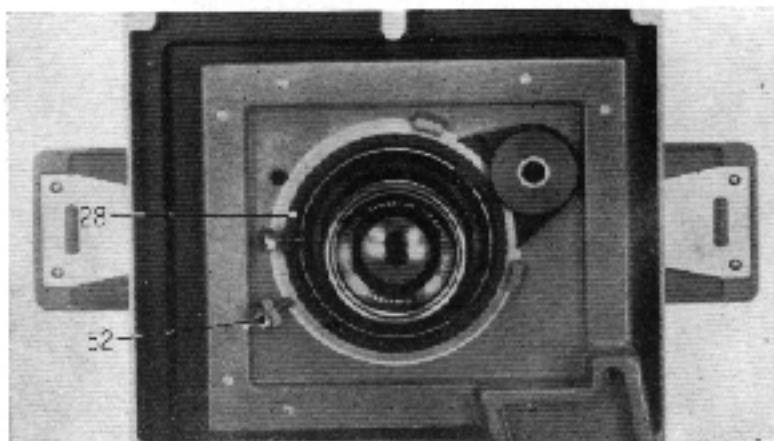
You can use the TAUPORT filter unit for the following work:

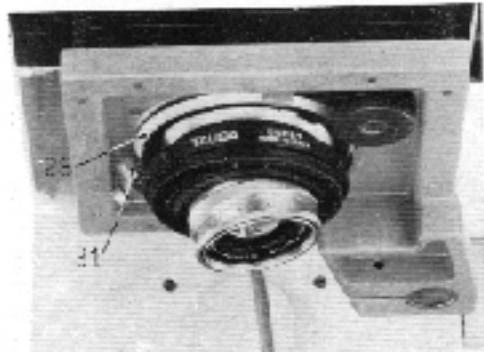
1. Colour enlargements according to the additive process with three normal filters;
2. Production of colour separations;
3. Enlargements upon gradation paper.

The TAUPORT consists of a connection ring upon which the lenses with lens board are fastened. Upon this ring are three swivel-mounts with colour filters (red, green, and blue) of 49 mm diameter. The filters are swiveled into the path of beams by turning the three knurled knobs, located one above the other, in a clockwise direction, and lock automatically at the centre of the path of beams.

After removing the standard connection ring (28), the TAUPORT unit is mounted with the swivel-mountings inwards upon the lens carrier and locked into place with the knurled screw (52).

**TAUPORT  
Filter Unit**





TAUBA



TAUBA

#### TAUBA Distortion Correction Lens Board

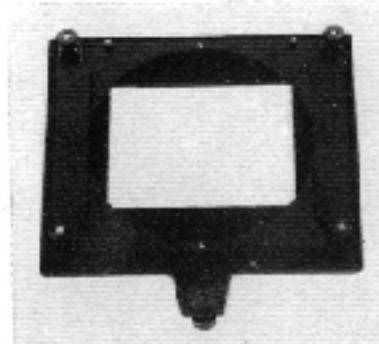
The distortion correction lens board TAUBA is suitable for all lenses up to 160 mm lens focal length. The TAUBA is locked upon the connection ring (26) after loosening the knurled screw (31) and removing the normal lens board. The lens — according to the thread — is screwed in the distortion correction lens board either directly or by means of a TALRING connection ring. This lens board consists of an outer ring with a knurled screw and an inner ball-and-socket joint with thread for the lens as well as various stops. This allows the lens to be tilted not only in one, but in every direction desired to correct distortion, and to be locked in position by means of the knurled screw. A stop for the zero setting is also built in.

#### OTODAP Adapter for Camera Backs

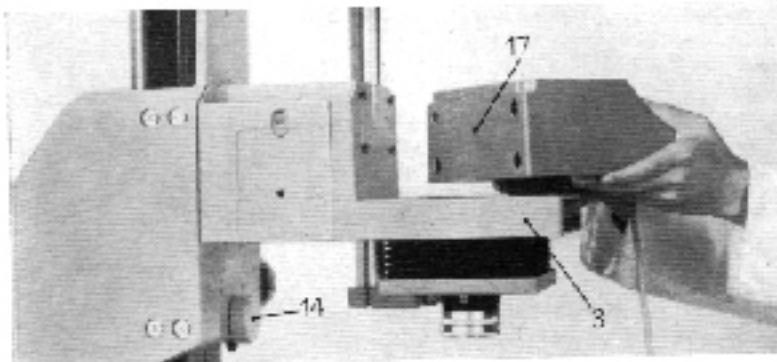
The OTODAP adapter was especially developed for using camera backs and is available for the following cameras: Linhof, Plaubel, Sinar, and Graflex. The OTODAP is fastened to the stage (3) by means of a knob. This is achieved after the condenser housing or cold-light unit has been removed by loosening the knob (17). Previously, however, lock the enlarger head by means of the knob (14), in order not to let bound up the stage (3) in the upper position, as the full weight for the compensation of the counterweight balance system is no longer present. For that reason, when adjusting the height of the



OTODAP PL



OTODAP LI

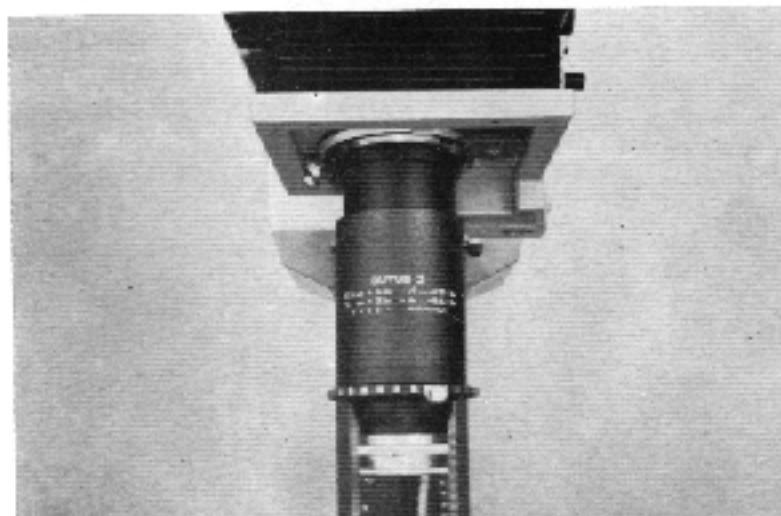


enlarger head, hold fast the stage (3) with one hand as a compensation for the counterweight balance, and tighten again the locking knob (14) after having found out the desired enlarger head position. When ordering the OTODAP, state the exact camera type!

An OTODAP PL with built-in POLAROID back is also available.

Adjustable extension tube for reductions and macrophotography. The lens is mounted by means of a lens board upon the DUTUB II and this is fastened to the lens stage. Thus the lens can be withdrawn further from the negative plane.

#### DUTUB II Extension Tube



DUTUB II

**OTOHAL 45  
OTOGRA 45  
GRADAP 45  
MIVALO  
Registering  
Equipment**

For the precise carrying-out of all photographic work which requires an exact register we deliver the following accessories, all of which work with a punched holes register system:

The OTOHAL 45 positioning frame, the OTOGRA 45 negative carrier for films up to 10 x 12.5 cm (4 x 5") the GRADAP register bar as well as the precision perforator MIVALO. The OTOHAL 45 positioning frame is inserted in place of the OTONEG negative carrier and immovably fixed; it contains the pulse for the automatic centring of the OTOGRA 45 negative carrier. The GRADAP register bar is provided with two microcentring pins on which the film is attached after having been perforated by means of the MIVALO perforator, and kept between two glass plates. The upper may be ordered as a special design with an anti-Newton ring coating.



OTOHAL 45 OTOGRA 45  
GRADAP 45

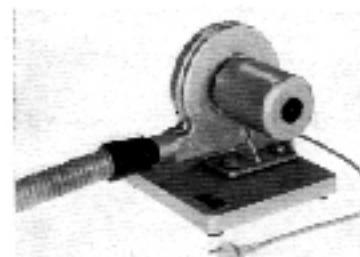


MIVALO

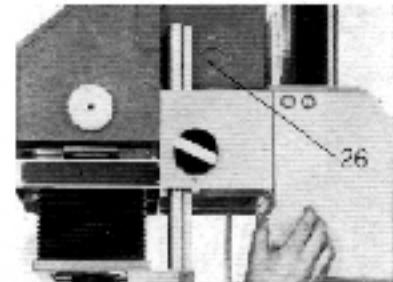
**LAFAN  
Cooling Blower**

The LAFAN cooling blower is delivered complete with a reinforced flexo-hose for connection to the lamp house, on the right side of which the aperture (26) is provided for the connection. Its output is 2 m<sup>3</sup> [approx. 237 cu. ft.] per minute.

The LAFAN is supplied for single phase current of 220 V/50 cycles. Special constructions for other voltages are possible.



LAFAN



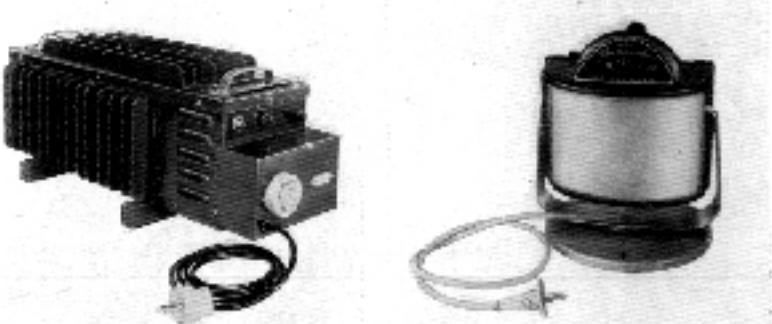
26

Protection against dust and humidity of the darkroom is provided by the practical strong plastic AUTOCUF protection hood.

**AUTOCUF  
Protection Hood**

The DURST voltage stabilizers, available in models for 500, 1000 and 2000 W, are indispensable to avoid false exposures due to frequent fluctuations in the mains current, especially during colour work. The DURST voltage stabilizers attain a stabilization exactness of ± 2% and are designed for 110, 160 and 220 V feeding voltage, 50 or 60 cycles. Output voltage 110 or 220 V.

**DURST STABI  
Voltage Stabilizers**

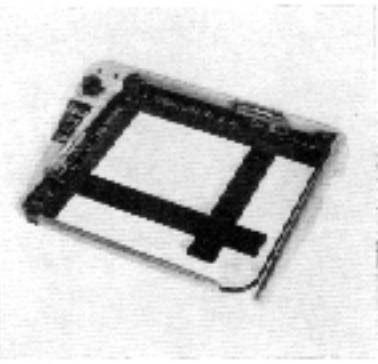


S1000

PENTACOLOR

A useful addition to your darkroom is the PENTACOLOR darkroom lamp. Five interchangeable filters, the first for white light, the others orange, ruby-red, olive-green and pungreen, are mounted in a turn-table which enables easy setting of the desired darkroom illumination. Bleaching is prevented by a heat absorbing filter. Indirect lighting by tilting the lamp body. The lamp may be attached to the wall or placed upon the table.

**PENTACOLOR  
Darkroom Lamp**



DURST 243

**DURST 243**  
**Masking Frame**

This masking frame relieves the operator of much manual and mental labour when adjusting the various formats. It consists of a stove enameled cast frame which makes it impervious to chemical action in the darkroom, with independently adjustable mask bands. Any required width of edge from  $5/32"$  up to  $13/8"$  ( $4-35$  mm) can be set by means of these mask bands and a paper stop which is adjusted by means of a knurled knob. Paper formats of up to  $9\frac{1}{2} \times 11\frac{1}{4}"$  ( $24 \times 30$  cm) can be used. The frame can be easily adapted to inch formats. At extra charge it can be supplied with a plastic veneered base board.

**Test Negatives**

Check the quality of your lens with the aid of our test negatives available separately, which also can be used as a focussing check. They are available in the formats 35 mm (24 x 36 mm) and  $2\frac{1}{2} \times 3\frac{1}{2}"$  (65 x 9 cm).