DEVELOPMENT

The following developers are recommended: —

Ilford ID-2 Developer
For Fine Grain Safety Positive Film.

Ilford ID-20 Developer
For Bromide Paper.

Both these developers may be obtained as packed chemicals or may be made up to the published formulae.

Time & temperature method of development
Recommended development times at 68°F (20°C).

Ilford material	*Developer and dilution*	*Development time*
Fine Grain Safety Positive Film	ID-2 1+2	4 mins. to 5 mins.
Bromide Paper	ID-20 1+3	1½ to 2 mins.

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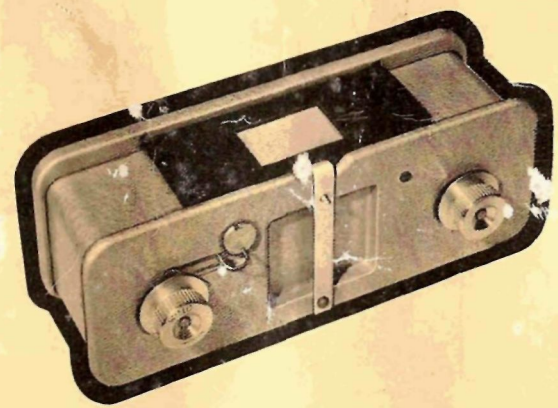
FSP/D57/S

Printed in England

ILFORD



FILMSTRIP PRINTER

GENERAL DESCRIPTION

The Ilford Filmstrip Printer is intended for the preparation of 35 mm filmstrips on positive film. It enables 3 5 mm negatives (miniature camera and cine sizes) to be printed by contact and negatives of any size to be printed by projection.

The printer has the following special features:—

1. Frames of either of the two standard sizes may be printed, viz.:—
   Double frame (miniature camera) .. .. 24 mm x 36 mm
   Single frame (cine) . . . . . 18 mm x 24 mm
2. Two single frames may be printed side by side in a strip which otherwise consists of double frames. This feature is valuable when comparison has to be made between two subjects or when a drawing and a photograph are required side by side for explanatory purposes.
3. The winding mechanism delivers a measured length of positive material so that the correct spacing of frames is assured.
4. The negative carriers are fitted with plate glass to ensure the best possible contact between the negative and film thus ensuring good definition.
5. Spools will accommodate 16 ft. of positive film; the feed spool and take-up spool are interchangeable.
6. Negatives can be inserted and moved independently of the positive film so that prints can be made in any desired order.
7. A red viewing window behind the positive film facilitates accurate positioning of the negatives when contact printing and simplifies exposure determination.
8. In addition to the preparation of filmstrips the Ilford Filmstrip Printer may be used for making contact proofs on paper from 35 mm miniature camera negatives.

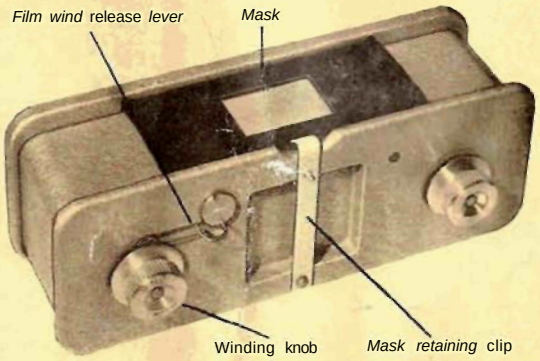


Figure 1

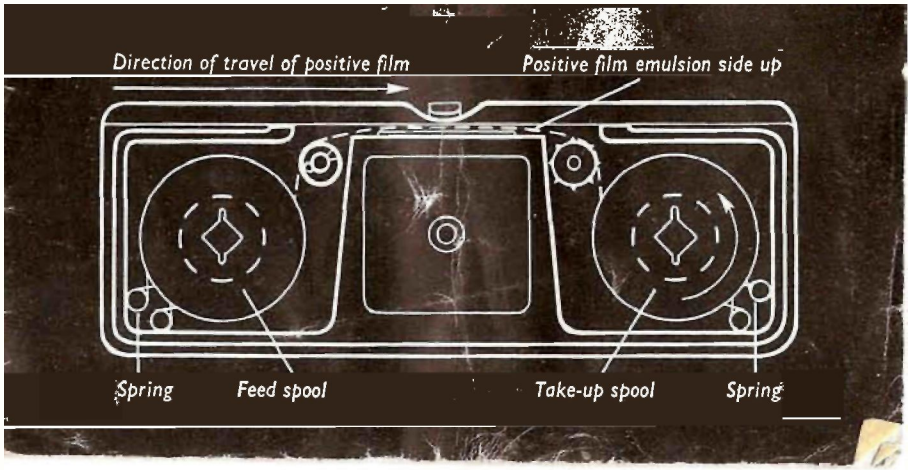
LOADING THE PRINTER

This and all subsequent operations must be carried out in a darkroom using a safelight suitable for the sensitive material being handled. For both Ilford Fine Grain Safety Positive Film and Ilford Bromide Paper the Ilford S Safelight, No. 902 (light brown) is recommended.

Remove the knurled knob in the centre of the back of the printer and take off the side cover. Take out the feed spool (the left hand spool) and remove the spring. Cut a suitable length of film from a roll of positive stock, trim the ends square and insert one end into the slot in the feed spool. Wind all the film, with the exception of the last 9 in. on to the spool emulsion-in. Replace the spring to prevent the film from springing loose. Replace the spool in the printer as shown in Fig. 2. Attach the free end of the film to the take-up spool in a similar manner so that when this spool is wound in the direction of the arrow on the winding knob the film is wound on the spool emulsion-in. Replace the take-up spool in the printer so that the film passes over the plain roller, the pressure plate and the sprocket roller. The path of the film through the printer should be as shown in Fig. 2. Replace the side cover. Wind on about 9 in. of the film as leader, checking that as the film tightens the perforations mesh with the teeth of the sprocket roller. It will be necessary to free the film winding mechanism at intervals by pressing the film wind release lever (see Fig. 1) on the side of the printer.

The loaded printer should not be exposed to white light

Figure 1



PRINTING

In order to avoid confusion when the filmstrip is projected, care must be taken at the printing stage to ensure that the frames of the strip are printed in correct sequence and that the disposition of the horizontal and vertical frames agrees with standard practice.
The instructions given below must therefore be carefully followed.

CONTACT PRINTING

Insert the negative of the first frame to appear on the strip—usually the START frame—in the two grooves of the negative carrier on the underside of the pressure plate (see Fig. 3), so that when the plate is closed on to the printer the emulsion side is downwards. Ensure that the negative is the correct way round (see pages 8 and 9), turning it end-for-end if necessary. Slide the negative along until it is accurately positioned in relation to the aperture of the mask.

Positioning of the negative is simplified by placing the printer—with both positive and negative films in position—over an illuminated viewing box or small light bulb (see Fig. 4). Such a light may also be of assistance in judging exposure times.

Note. The safety of any lamp or viewing box used for this purpose must be tested, and the brightness reduced (e.g. by placing white paper behind the window if any signs of fog are shown).

When the negative is correctly positioned, expose to a light source above the printer. A low-power bulb a few feet away is quite suitable. Another method is to place the printer in the centre of the easel of a vertical enlarger set out of focus.

It is important to give the correct exposure time and ways of determining this are suggested on page 9.

After making the first exposure, press down the spring next to the winding k»ob and wind until the spring clicks back into the slot. If a single-frame negative is being printed, then sufficient film will have been wound on. If a double-frame negative is being printed, the procedure should be repeated.

After the END frame has been exposed, wind on a few blank frames for the trailer (say 9 in.), open the printer and cut off the exposed length.

The film should then be processed and, when dry, wound emulsion out with the END frame to the centre.

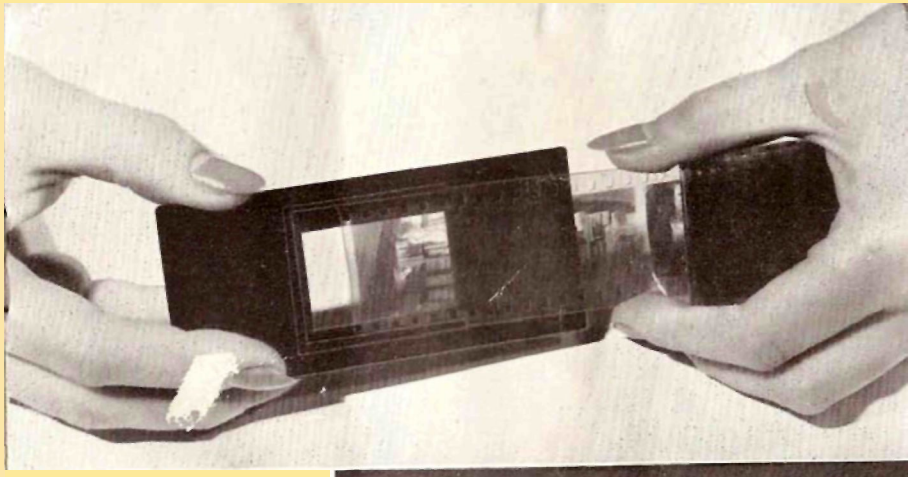
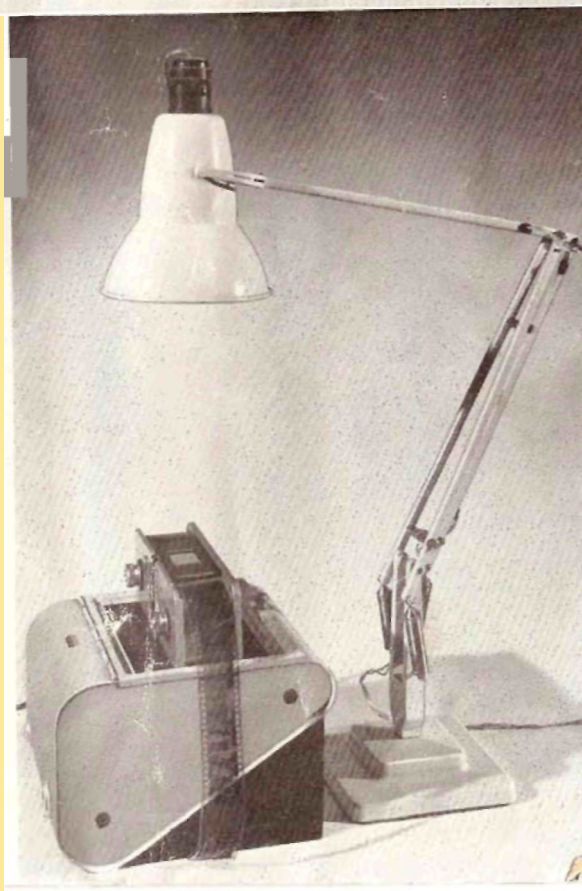


Figure 3

The negative is inserted in the printer by sliding it into the two grooves of the negative carrier on the underside of the pressure plate. The negative should he inserted so that the celluloid side of the film is next to the pressure plate.



Arrangement for contact printing employing a table lamp as a light source. Light for examining negatives through the red window of the printer is provided by a darkroom lamp, the safelight screen of which has been removed and replaced by a sheet of clear glass masked with black paper. As an alternative an Ilford S Safelight, No. 902 *(light brown) may be fitted in the darkroom lamp.*

Figure 4

PROJECTION PRINTING

A vertical enlarger is the most convenient type for the work as is seen from the photograph opposite, but whatever type of enlarger is selected it must have considerable extension, as same-size or reduced images will normally be required.

Much of the proceduresfor projection printing is similar to that described already for contact printing and the instructions for *this* should first be read.

Instead, however, of placing the negative in the printer it is inserted in the negative carrier of the enlarger and the image is focused and composed on the positive film seen through the aperture at the top of the printer.

Obviously, this can only be done with a safelight cap over the enlarger lens, but even this, owing to the high brightness of the small images employed, may not be safe. It is therefore suggested that a paper shield should be made of two thin pieces of paper 1¾ in.x 6 in., one black and one white, glued back to back, and inserted between the pressure plate of the printer and the positive film. Focusing **and** composing can be carried out on the white side, which should be uppermost, while the black paper on the underside will keep light from the film.

When the image is correctly composed and focused the enlarger should be switched off (or a cap placed over the lens), the pressure plate raised to allow the paper shield to be removed, and the plate then lowered again. The exposure should then be made by switching on the enlarger (or removing the lens cap). Suggested methods for deter mining the exposure time are given on page 10.

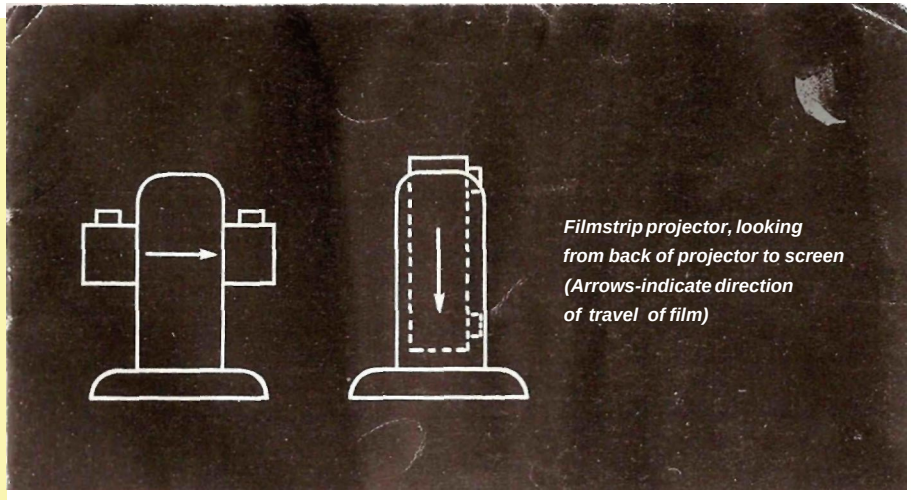
As in contact printing, the arrangement of horizontal and vertical images on the film should follow standard practice as described on pages 8 and 9.

Figure 5

ARRANGEMENT OF HORIZONTAL AND VERTICAL FRAMES

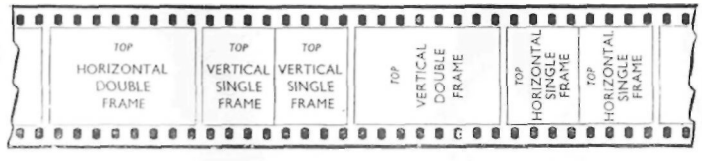
During projection the filmstrip passes through the projector: (a) from left to right, looking from the projector to the screen, or (b) from top to bottom, the winding knobs being on top or on the right as shown in the diagrams opposite.

If the film is examined the image is seen the right way round, but upside down. Although many projectors have film carriers which will rotate through 360° , much inconvenience can be avoided if filmstrips are printed so that the projector can be used with the carrier in one or other of the two positions shown above, rotation of the carrier being limited to 90°. A uniform arrangement for horizontal and vertical frames has therefore been agreed upon and it is standard practice for a projectionist to rotate the film carrier through 90° in a clockwise direction when changing from a frame with verticals at right angles to the length of the film as is the case in (a) to one with verticals parallel to the length of the film, as in (b). The projectionist can of course only follow these directions with success if the frames arc correctly printed on the strip. Examples of the correct arrangement to be followed in printing are shown in the diagram opposite and these should be carefully studied before beginning printing. For the sake of uniformity all strips should be similarly arranged even if the frames are all horizontal or all vertical. During printing the positive film is cmulsion-up, and when the directions given here for the arrangement of frames are followed, the first frame of the strip is on the left and is the first to be printed.

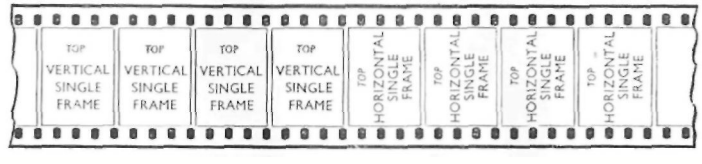


Filmstrip projector, looking from back of projector to screen (Arrows-indicate direction of travel of film)

Figure 6



Double-frame strip, including pairs of single-frames



Single-frame strip

Figure 7

ESTIMATING EXPOSURE TIME

Contact printing. Provision for judging exposures in contact printing is made in the form of a red window immediately below the positive film. This window makes it possible to judge the density of a negative by holding the printer—with both positive and negative films in position —over a small illuminated viewing box as described on page 4.

To make the most use of this facility, test exposures should first be made, and it is suggested that an average negative and typical thin and dense negatives should be selected for the purpose.

Several exposures should be made of each of the three negatives over a range of exposure times. To avoid the need for loading and unloading the printer such test strips can be made on short lengths of film laid on top of the printer and held in position by the mask.
The correct exposures for these three trial negatives can then be judged by' examining the processed prints on a viewing box while still wet. A correctly exposed positive should have perceptible detail in the high-lights.
With an average negative the approximate exposure time required when printing on to Ilford Fine Grain Safety Positive Film with a 15W tungsten filament lamp 4 ft. (120 cm.) from the negative is 7 secs. This applies with a lamp in reflector; without reflector the time required will be about double.
When the exposures of the three typical negatives have been determined, printing of the actual strip can commence, each negative being viewed quickly by light through the red window to estimate its density in relation to the typical negatives for which the exposure is known.
In exceptional cases it may be necessary to make a trial exposure for every frame.

Projection printing. The factors governing the correct exposure time in projection printing are more numerous than in contact printing owing to the wide variation in negative size, type of enlarger, etc.
Many workers judge exposure times for this work by experience, aided by test strips or any other of the aids normally employed in enlarging, but for consistent results use of an exposure photometer is recommended. Readings should be taken on the highlights, i.e. the densest areas of the image, and not on the shadows as is usual when printing on paper.

PRINTING ON PAPER

Throughout this instruction book the positive material is invariably referred to as film, but the Ilford Filmstrip Printer can equally well be used for printing on paper, e.g. for making the paper strips that are sometimes required for reference purposes in filmstrip work, and for making contact proofs from miniature negatives. The procedure to be followed is exactly the same as has been described for film, except that the opaque base of the paper prevents negatives being viewed by light through the red window when contact printing.
The exposure required when printing on to paper is very close to that required with film.

PHOTOGRAPHIC MATERIALS

The following ILFORD materials arc recommended:—

Ilford Fine Grain Safety Positive Film. The standard film for making positive filmstrips. Has a clear base. Available in perforated 35 mm rolls in lengths of 5 metres (16 ft. 5 in.), 101 ft. (30 metres) and 400 ft. (120 metres) unspooled, wound emulsion-in, without leader or trailer.
When ordering, specify 35 mm width, as the film is also made in the 16 mm width.

Ilford Bromide Paper. Glossy, single-weight Bromide Paper, in the Normal contrast grade only is available in perforated 35 mm rolls 50 ft. and 100 ft. long, and is recommended when paper prints of filmstrips are required for reference purposes, and for contact proofs of miniature negatives.
These two materials are similar in speed, contrast and colour sensitivity. Both are non-colour-sensitivc and may be handled and processed by the relatively bright light of the Ilford S Safelight, No. 902 (light brown).

PROCESSING EQUIPMENT

The apparatus required will depend on the volume of work to be under-taken and on the length of film it is desired to process. Large dishes or deep tanks arc probably the simplest form of apparatus and arc perfectly suitable for strips of moderate length. An Ilford Weight Ring is a useful accessory for the development of longer films in deep tanks. The fi|m is doubled over and held at the top by two clips, the weight of the ring keeping the film taut and separated. For strips up to *6* ft. 5 in. in length Ilford Limited supply the Polly-Max Developing Tank. This will accommodate up to about forty double-frame exposures with leader and trailer.
For very long lengths of film the Ilford M.M.R. Processing Frame and Cradle may be used. The Frame will accommodate 23 ft. of film and should be used in conjunction with a standard 14 in. x 17 in. X-ray tank, such as the Ilford No. 171 X-ray Processing Tank. The Cradle is used to provide a pivot for the Frame when winding on the film.
Lengths of paper must be handled with great care in processing, whatever processing method is used.