

**Figure 2.1**

- 1 Door
- 2 Cooling duct (flexible)
- 3 Lamp assembly (green)
- 4 Lamp
- 5 Light mixing box (35mm format)
- 6 Register plate (35mm format)
- 7 Lamp assembly (blue)
- 8 Door roller catch
- 9 Fan housing
- 10 Light mixing box (6x7cm format)
- 11 Register plate (6x7cm format)
- 12 Light mixing box (4x5 inch format)

**2.1 MULTIGRADE 500H enlarger head**

See figure 2.1.

The MULTIGRADE 500H enlarger head replaces the original condenser, diffuser or cold cathode lamphouse used with most professional enlargers. It is fitted to the enlarger chassis using an adaptor kit, designed to make installation quick and relatively simple. Full instructions are supplied with each adaptor kit.

The range of adaptor kits currently available enables the MULTIGRADE 500H enlarger head to be fitted to the most commonly used professional enlargers. For some enlargers, two kits are available; a diffuser kit (which converts condenser enlargers to diffuser) or a condenser kit (which enables the enlarger condensers, and therefore, all the associated characteristics, to be retained). In these cases, the choice of kit depends on whether the user prefers diffuse or condensed light. Where no choice is available, diffuser kits are supplied.

**2.1a Light source**

Two, high output, quartz halogen lamps and associated heat filters are fitted inside the enlarger head. Light from one lamp passes through a blue dichroic filter, and light from the other lamp passes through a green dichroic filter. Separate blue and green light beams are produced, and their intensities are varied independently by electronic control of the voltage to each lamp. The light beams are mixed, reflected and diffused in the light mixing box to provide even illumination of the negative. The resulting color variation enables the wide contrast range, available with ILFORD variable contrast papers, to be used to its full advantage.

**Note**

Blue and green filters do not transmit red light. It will not be possible, therefore, to use the enlarger below-the-lens red safety filter during, for example, multiple exposures from one



IL558

MULTIGRADE 500CPM control unit

Figure 2.2

negative. However, the choice of filtration, coupled with the heat filters, reduces the problem of negative popping.

**2.1b Light mixing boxes**

The correct mixing boxes for your enlarger are supplied as part of the adaptor kit. See, also, section 14 MULTIGRADE 500H enlarger head.

To fit light mixing boxes, see section 4.1a.



## Figure 2.2

- 1 Exposure time/print counter display
- 2 Grade display
- 3 Memory display
- 4 Exposure time buttons
- 5 For manual burning-in operations
- 6 Focus button
- 7 Grade buttons
- 8 Batch counter buttons
- 9 Memory buttons

### 2.1c MULTIGRADE 500 light mixing box retainer kit

To protect the delicate internal components in the enlarger head (such as the lamps and filters) on enlargers that have the facility to tilt the head, the ILFORD MULTIGRADE 500 light mixing box retainer kit (part number 6069-P-003) must be fitted. This kit is designed to clamp the light mixing box and lampholder assemblies in position, and is supplied with full fitting instructions.

#### WARNING

To prevent damage, do not tilt the head without the light mixing box retainer kit fitted.

### 2.1d Cooling

To dissipate the heat generated by the lamps, the MULTIGRADE 500H enlarger head is force cooled by a centrifugal fan housed in the top of the head.

For maximum effect, the cooling air travels through two flexible ducts, one directed to each lamp and filter assembly. Air exits through two light-tight vents, one in each side of the head.

### 2.1e Safety features

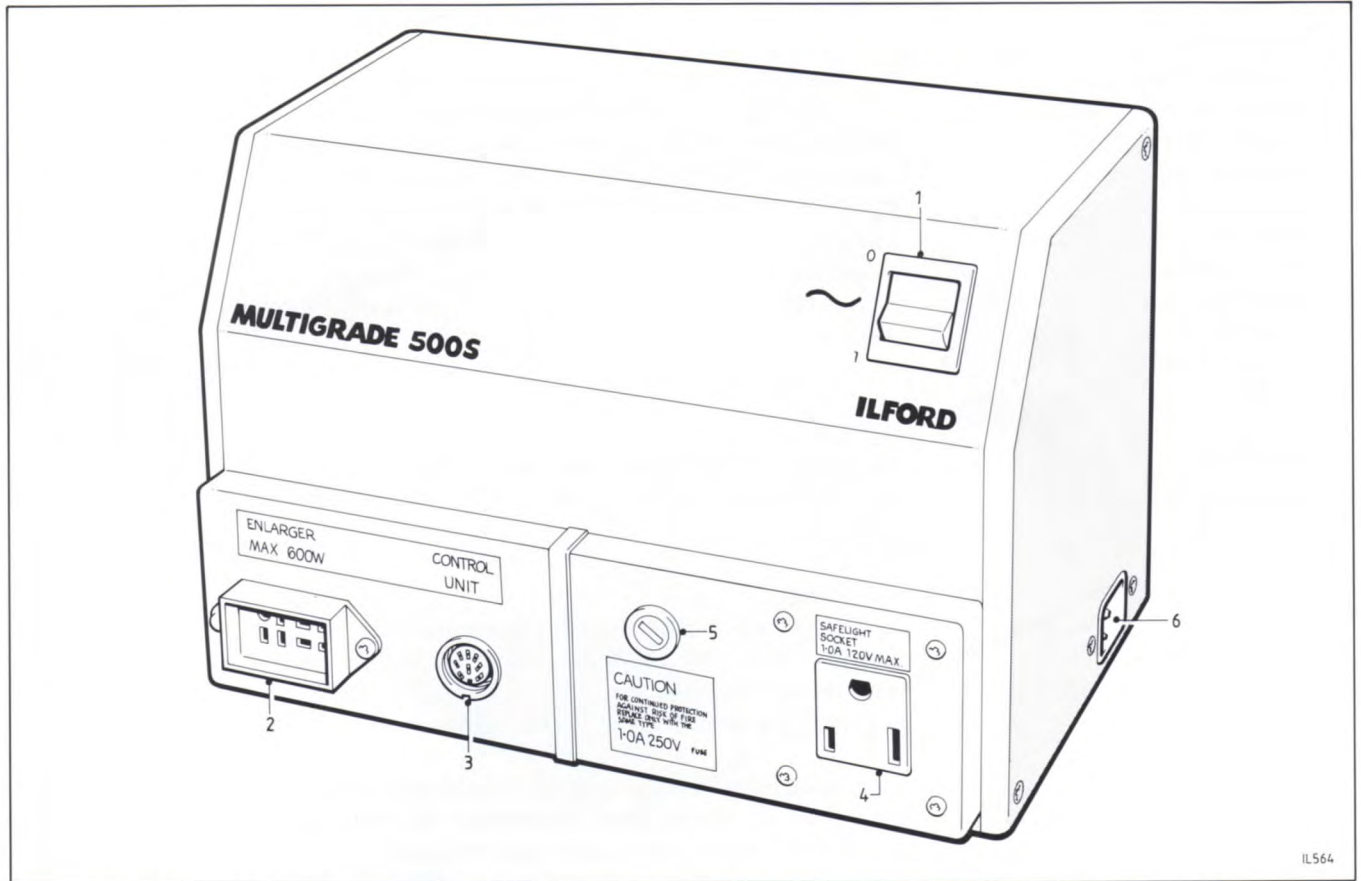
The following safety features are included in the MULTIGRADE 500H enlarger head:

- 1 The fan is timed to continue running for approximately two minutes at the completion of any operation involving the enlarger lamps, or when the equipment is first switched on.
- 2 In the event of fan failure, power to the fan and both lamps is switched off after one minute.
- 3 A micro-switch removes power to both lamps and the fan assembly when the door is opened.

### 2.2 MULTIGRADE 500CPM control unit

See figure 2.2.

The MULTIGRADE 500CPM control unit is an improved version of the MULTIGRADE 500C control unit which is no longer available. The two units are fully interchangeable but their controls are different. The control unit is quick and



MULTIGRADE 500S power supply

Figure 2.3

simple to operate. Once the exposure time is established at a particular contrast, microprocessor electronics automatically adjust the light intensity to each lamp, to ensure the exposure time remains constant across the contrast range.

All controls are described in section 3.

For maximum operator safety, the control unit is powered entirely by low voltages supplied from a remote power supply (see section 2.3).

The brightness of the displays is optimised to be seen under normal darkroom lighting. During normal use, the displays will not fog ILFORD variable contrast papers or other black and white papers of similar sensitivity.

#### 2.2a Automatic frequency setting

When the control unit is switched on, it measures the frequency of the incoming electrical mains supply and automatically



**Figure 2.3**

- 1 On/off switch
- 2 Socket, enlarger head
- 3 Socket, control unit
- 4 Socket, safelight
- 5 Fuse, safelight socket
- 6 Power input

adjusts the internal control circuitry accordingly. The measured frequency is displayed briefly on the exposure time display (see section 5).

### 2.2b Automatic voltage stabilization

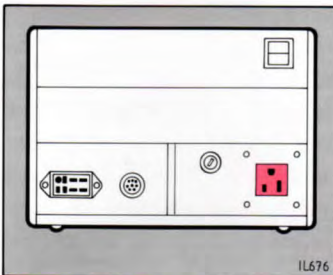
Automatic voltage stabilization is built into the MULTIGRADE 500CPM electronic circuitry, and compensates for variations in mains voltages up to  $\pm 4\%$ . This ensures that light output remains constant within this range of input voltages.

The automatic voltage stabilization circuitry is controlled by the 'VC' switch, located on the rear panel of the control unit, enabling the circuitry to be switched on or off as required. See, also, sections 3.10 and 4.3e).

### 2.3 MULTIGRADE 500S power supply

See figure 2.3.

The MULTIGRADE 500S power supply is connected directly to the electrical mains supply. It has sockets for connecting the enlarger head, control unit and safelight, positioned on the front of the unit for easy access. The on/off switch (labelled '1/0') controls power to the three sockets, and incorporates a neon indicator.



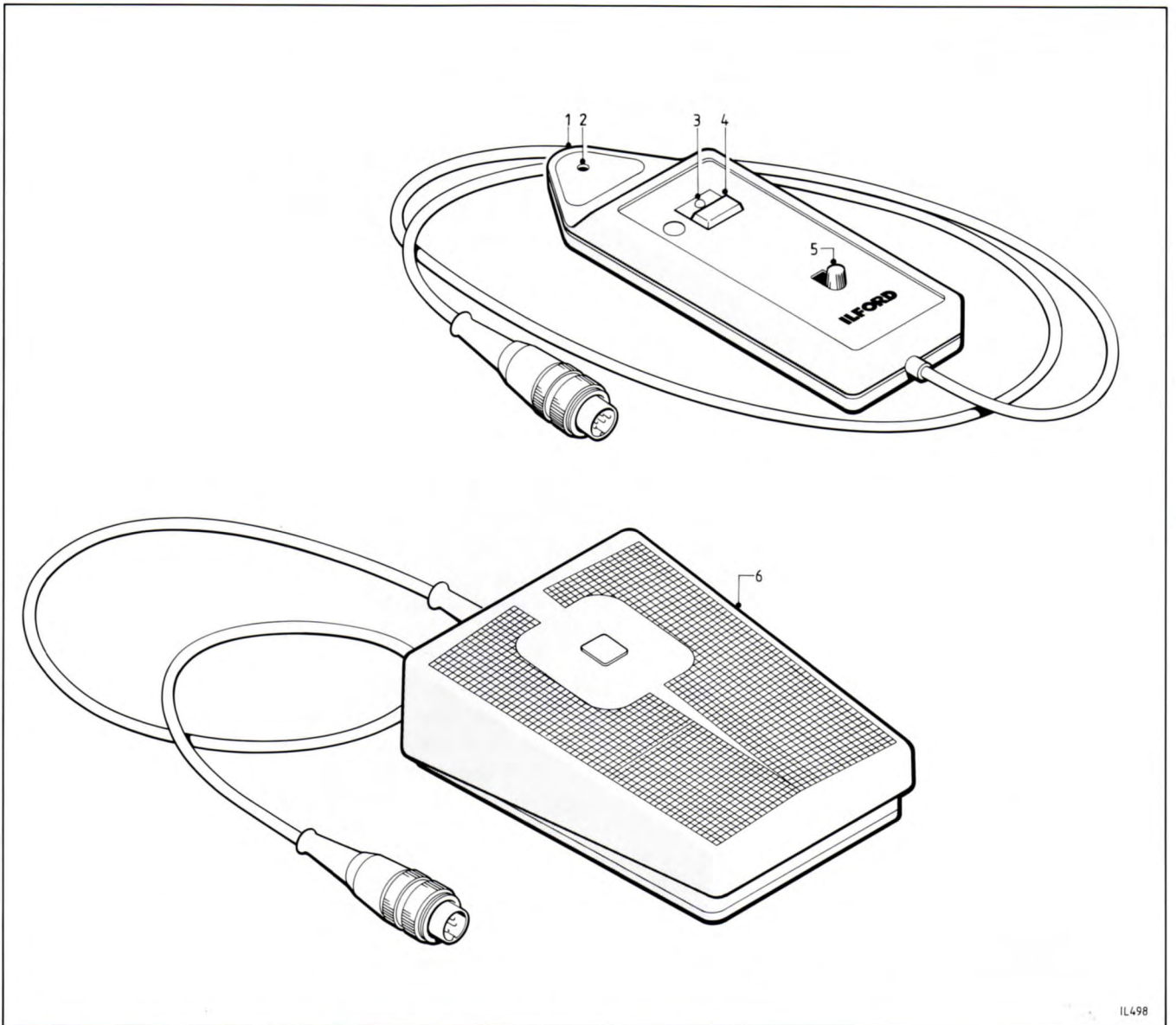
### 2.3a Safelight synchronisation

Any safelight that is plugged into the 'safelight 1 amp' socket on the power supply is controlled by the MULTIGRADE 500CPM control unit. During 'focus' and 'burn' operations, and during an exposure, the safelight is automatically switched off. To connect the safelight, see section 4.3c.

### 2.4 MULTIGRADE 500F footswitch

See figure 2.4.

The MULTIGRADE 500F footswitch is available as an optional extra, and enables the printer to keep both hands free. In all the following sections, functions that are controlled by the 'expose-cancel' bar are controlled in the same way by the footswitch.



IL498

MULTIGRADE 500F footswitch and 500P exposure probe

Figure 2.4

### 2.5 MULTIGRADE 500P exposure probe

See figure 2.4.

The MULTIGRADE 500P exposure probe is available as an optional extra, and provides automatic display of the optimum exposure time at the grade selected, from

a spot reading. Using the probe saves paper and time by eliminating the need to make test strips or sheets.

For a detailed description of how to use the probe, see section 10 and the leaflet supplied with the probe.

**Figure 2.4**

- 1 MULTIGRADE 500P exposure probe
- 2 Photocell
- 3 LED
- 4 Probe switch
- 5 Calibration knob
- 6 MULTIGRADE 500F footswitch

**2.6 Photographic papers**

The MULTIGRADE 500 system is designed for use with ILFORD MULTIGRADE variable contrast papers.

Prints from graded papers such as ILFORD ILFOSPEED can be made by using grade  $4\frac{1}{2}$  to give the best compromise between exposure time and image visibility.