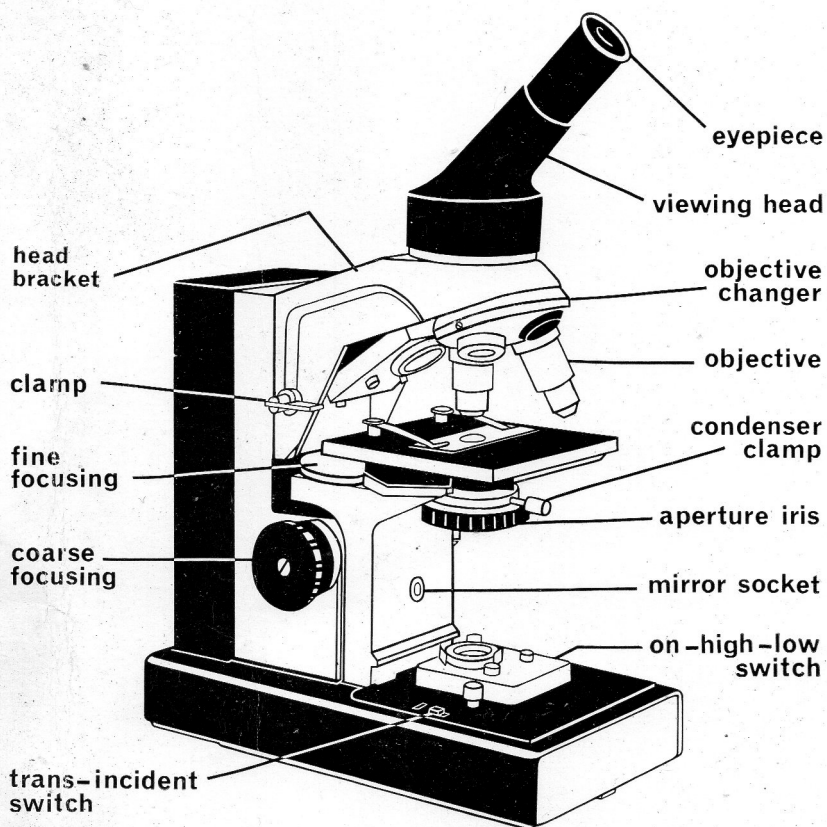


M10a MICROSCOPE INSTRUCTIONS



General Care—

Always keep the microscope covered when not in use. Keep any solutions away from the instrument and do not store near corrosive fumes. Do not attempt to remove any lenses or fixed items. Only lens tissue should be used to clean optical components. Switch off when not in use. Right hand switch to off.

Careful and considered use of the M10A microscope will be rewarded by many years of trouble free operation.

Unpacking

When removing the microscope from its expanded polystyrene packing do not grip any controls, the viewing head or objectives, but hold the limb and base and lift with two hands.

The objectives, condenser, eyepiece viewing head and lamp units are fitted in place and no attempt should be made by the operator to remove them. Care must be taken to avoid touching any glass surfaces as greasy marks on the lenses will seriously impair the definition. The spare objective aperture must be fitted at all times with a screw-in dust cap.

The instrument is normally used with the limb away from the observer.

Electrical Connection

The electric models are supplied for 240 volts 50 cycles.

Connection should be made to an earthed supply as follows:—

Green/Yellow	—	Earth.
Brown	—	Live.
Blue	—	Neutral.

General Points

The coarse focusing knobs are fitted with clutches to avoid damage to the mechanism on overrunning the stops at the extreme ends of the focusing range. The $4\times$ and $10\times$ objectives cannot contact the stage. The $40\times$ objective is fitted with a spring mount to prevent collision damage to slide or objective front. The fine focus wheel, accessible from either side, operates over the whole coarse movement and is graduated from 0 to 1000 read from an index on the right hand side, each division being equal to 10μ .

The viewing head may be swivelled on a free cone fitting.

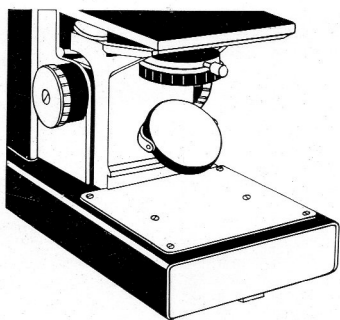
The standard condenser is fitted with a daylight blue filter and a large wheel controlled aperture iris. Clockwise open, anti-clockwise closed. The diaphragm is normally employed open. The condenser may be raised or lowered in its sleeve fitting and clamped in height by the forward facing screw. The condenser is normally used in its upper position. The whole head bracket may be raised 1" to accommodate large specimens after releasing the left hand clamp lever. Up clamped; down free.

Lamp Units

The lamp is switched on by the switch to the right hand side of the base. The switch should normally be used in the low position—leaving the switch at high for any length of time will reduce the life of the bulb.

The left hand switch switches the lighting from incident to transmitted when the appropriate lamps are fitted.

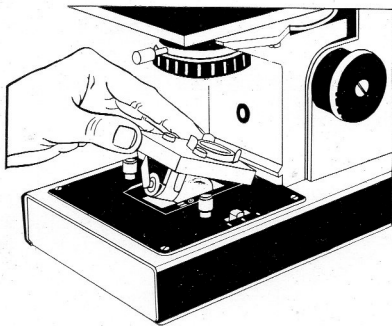
The transmitted unit may be centred to improve illumination after releasing the two knurled clamp screws and moving the unit bodily. The lamp unit condenser lens may also be centred by rotation of the lens capsule. Centration is only necessary after a bulb change.



A 32mm diameter filter may be clipped into the lamp unit filter holder. The mirror in gimbal is held firmly in a plug-in socket beneath the condenser mount when an external lamp is employed. Do not use excessive pressure to insert or remove the gimbal from the socket. Keep the mirror clean. The built-in transmitted lamp unit cannot be used when the mirror is in place.

Changing the Bulb—

Release the two cross headed screws with a suitable screwdriver (Posidrive or Phillips type). Lift the lamp unit free as shown. Fit the bulb in the bayonet mount. Wipe off any marks. Refit the prongs into the connectors, press unit well home and retighten the screws.



Use of the Microscope

(1) Transmitted Light.

1. Switch right hand switch to "low", left hand switch to "trans" (or adjust mirror).
2. Raise condenser and open aperture diaphragm.
3. Place specimen under slide clip and swing in $10\times$ objective.
4. Focus first with coarse knob and then finally with the fine wheel.
5. All objectives should now be very nearly in focus and need only be focused with the fine wheel.
6. If necessary adjust the image contrast with the aperture control. Leave open with $4\times$ objective. Closing the diaphragm too far will reduce resolution.

Any area of interest may be indicated by moving the specimen to the built-in pointer.

(2) Incident Light—Oblique.

1. Switch right hand switch to "low", left hand switch to "Inc".
2. Place specimen on stage (where possible specimens should be mounted on a glass slide) and swing in $3\times$ or $10\times$ objective only.
3. Focus first with coarse knob and then finally with the the fine wheel.
4. If necessary the objective to stage clearance may be increased by raising the head bracket after lowering the left hand clamp.

Any area of interest may be indicated by moving the specimen to the built-in pointer.

The $40\times$ objective cannot be used with the incident lamp unit.

M10a MICROSCOPE

IMPORTANT

Illumination of 40x objective

The aperture of this objective is only fully illuminated if the frosted disc is fitted into the lamp unit filter holder. To centre the unit the filter should first be removed. On removing the eyepiece from the viewing head an image of the filament will be visible down the tube. The lamp unit should be freed by releasing the clamp screws and then shifted bodily until the filament image is well centred to the objective back focal plane, visible down the tube. After replacing the eyepiece and frosted disc the image will be found to be well and evenly illuminated.

Diffuser Disc

The disc should always be placed frosted surface up in the lamp unit filter holder.

NEVER use solvents to clean the disc.

Light rubbing with a toothbrush and soapy water is adequate to remove any normal marks.

Polarizer with Monocular Head

The polarizer for the standard condenser locates with the plane of polarization E.W. The polarizer in the polarizing phase condenser slide is also orientated E.W. The monocular head must be orientated to face the front or rear of the microscope. When the eyepiece is rotated to cross the analyser and polarizer, the analyser will be orientated N.S.

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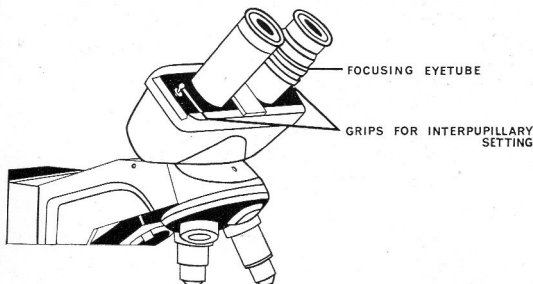
SUPPLEMENT TO M10a INSTRUCTION FOLDER.

Binocular head, phase unit and polarizing filters

Binocular Head.

The binocular head is fitted with twin eyepiece tubes. The left hand tube is fixed. The pointer eyepiece should always be placed in the fixed left hand tube. Provision is made for inter pupillary separation adjustment.

When first focusing the microscope image, close the right eye and with the left hand eyepiece focus with the fine focusing mechanism. Having focused for the left eye, open the right eye and using the right hand focusing eyetube (twist to focus) focus the image for the right hand eye. Do not attempt to make this adjustment with the fine focusing mechanism.



Both eyetubes should now be similarly focused and further image focusing is made entirely with the stage focusing mechanism.

Polarizing Accessories.

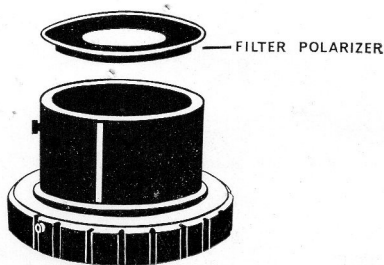
As supplied with phase unit.

The special annulus slider is fitted with a fourth aperture containing a film polarizer orientated East-West. The analyser filter is permanently mounted in the eyepiece which may be rotated for extinction.

As supplied with standard condenser.

The polarizer is contained in a plug-in mount which fits in the top of the condenser (the condenser must first be removed before fitting the filter).

The analyser filter is permanently mounted in the eyepiece which may be rotated for extinction.

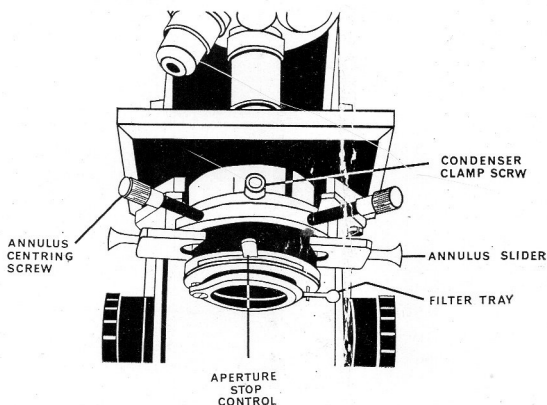


Phase Contrast.

The 10 \times and 40 \times phase contrast objectives are marked "Ph" in addition to the standard engraving.

The condenser is itself non-centring but is fitted with two finger screws to enable the phase annuli to be centred to the objective phase rings.

The two phase annuli and a clear aperture (not to be used with 100 \times objectives) are held in a locked in slider.



The swing-in filter carrier will accommodate 32 mm diameter filters.

A lever operated aperture stop is fitted for bright field work.

Use of the phase unit.

1. Swing in the 10 \times phase objective and raise the condenser as high as possible (after releasing the clamp screw).
2. Use the clear slider aperture and focus up a non-phase stained specimen.
3. Remove one eyepiece, insert the auxiliary telescope and by sliding the telescope focusing tube (clamp it before and after with small side screw) focus the dark objective phase ring.
4. Slide the annulus slider in until a bright annulus ring of slightly smaller size than the dark objective ring is visible.
5. Match the two rings by operating the annulus centring screws. If the dark ring does not completely cover the light ring drop the condenser a little until it does.
6. Replace the eyepiece and place phase specimen on stage.

When changing from 10 \times to 40 \times and vice versa it will be necessary to check the phase ring adjustment with the auxiliary telescope.

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