

BECK DIAMAX AND EPIMAX MICROSCOPES

INSTRUCTION MANUAL

INTRODUCTION

Although microscopes differ in constructional details, they all incorporate two essential features :

(a) Illumination system.

(b) Observation system.

The illumination system includes a substage condenser by which light is focussed upon the object under examination. The light may be a lamp fitted to the microscope base or an external light source reflected into the light path by a mirror.

The observation system consists of an objective which forms a magnified image which is again magnified by an ocular to form the final image seen by the eye. The extent of the magnification depends on the focal length of the objective and ocular and their distance apart, normally 160 mm, which is known as the tubelength.

Figure 1 shows the Diamax microscope diagrammatically. The observation tube is inclined at a convenient angle and it will be noticed that the image is formed in space about 25 cm from the eyepoint. The illumination is from a light source fitted within the base. The condenser, which concentrates the illumination, is held below the object stage, in a sleeve with focussing and, in some instances, centring controls.

Both the objectives and oculars are available in different magnifications. For convenient interchange the former are held in a revolving turret, the latter accommodated loosely in the top of the tube. The magnifications are engraved on both units and the total magnification obtained is the product of the particular pair in use.

The thickness of specimen in sharp focus, the extent of the field of view and the working distance between the front of the objective and the specimen decrease as the magnification increases. It is consequently advisable to employ the minimum magnification necessary consistent with the adequate resolution of the detail it is desired to identify.

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DIAMAX MICROSCOPE

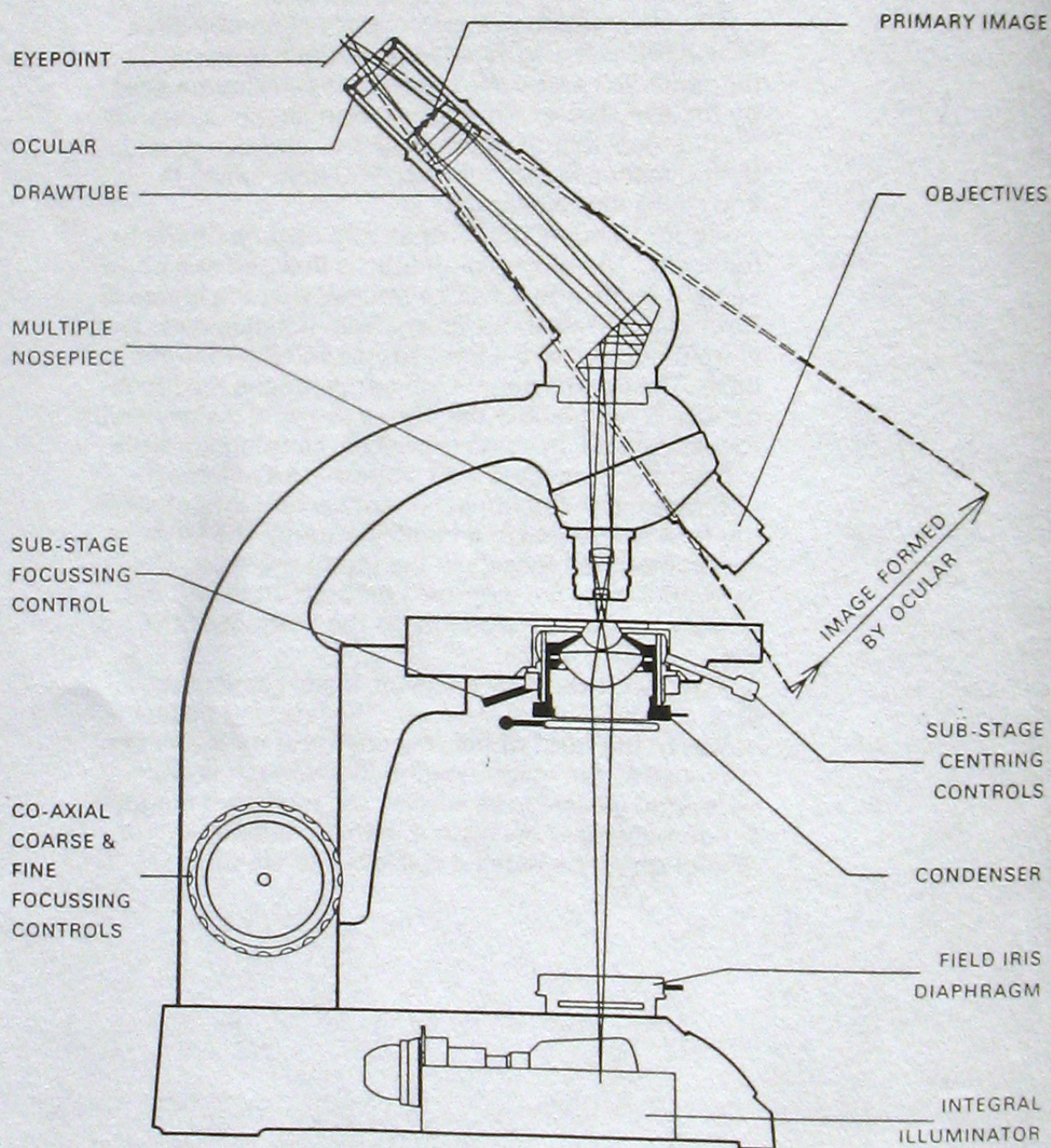


Fig. 1

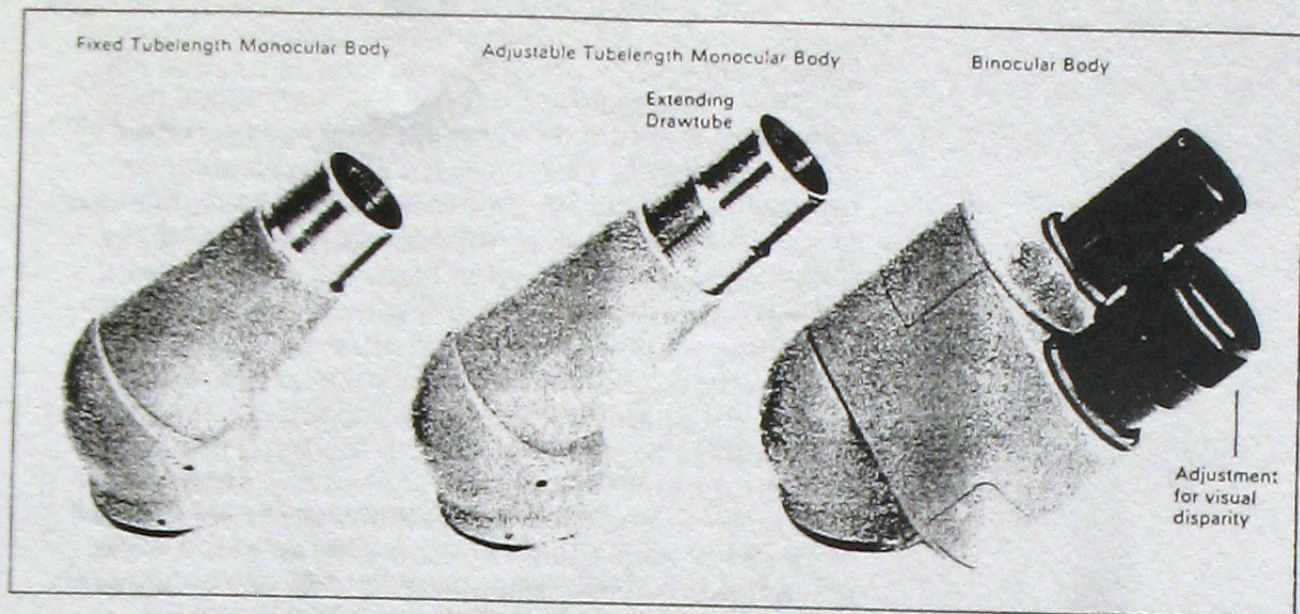


Fig. 2

BODYTUBES

Figure 2 shows three types.

The fixed monocular body is intended for use with objectives corrected for the standard 160 mm tube-length and a cover glass of .18 mm thickness.

The adjustable monocular body has an extensible drawtube graduated from 140 to 180 mm. The body magnification is $\times 1.25$ at 160 mm so that the figure calculated as stated on page 1 must be increased by this amount. For each tubelength extension of 10 mm a further increase of 8% occurs. The drawtube is useful for calibrating a micrometer scale located on the field stop of an ocular, against a stage micrometer.

The binocular body also has a magnification of $\times 1.25$ due to the increased path length. An adjustment for the interocular distance enables the operator to ensure that the two images are combined. The left hand tube has a length adjustment by a milled collar for compensation of differences between the two eyes. To use, close the left eye and focus the microscope using the right eye only. Then, closing the right eye, and using the left eye only, adjust the rotating collar until the specimen is again focussed.

For projection purposes a vertical monocular tube with a length of 160 mm is supplied. It is fitted to the microscope in the same manner as the units described above and carries the standard size oculars.

OBJECTIVES

These are engraved with the magnification value, numerical aperture, cover glass thickness and tube-length (normally 160 mm), for which the objective has been adjusted for optimum performance. For ease of identification they also bear a coloured band as follows:

$\times 100$	Red
$\times 45$	Yellow
$\times 20$	Light blue
$\times 10$	Dark blue
$\times 3.5$ and	
$\times 5$	Violet

The $\times 100$ objective is of the immersion type. A small bead of the oil supplied is dispensed onto the cover glass and the stage raised slowly until oil contact with the objective is made, following which normal focussing is continued using the sensitive control only. After use the oil should be removed from the lens surface with a clean lens tissue slightly moistened with xylol or benzene.

To avoid damage resulting from the objective coming into contact with the slide, the optical components of the higher power objectives are contained in a retracting mount seated on a compressible spring.

OCULARS

The magnifications normally employed are $\times 6$ and $\times 10$, while the $\times 15$ can be supplied for occasional use. They are engraved with their magnification and are an easy fit in the bodytube so as to be readily interchanged. The lower power oculars are more convenient to use than the higher power type because the eyepoint (also known as the Ramsden disc) is further away from the glass of the top lens, and the field of view is larger.

If the ocular used with a particular objective is excessive in power, loss of definition will occur. To avoid this the magnification should be restricted to one thousand times the numerical aperture of the objective. Thus, resolution will be lost if an objective $\times 45$ which has an aperture of .65 N.A. is used with a total magnification of greater than $\times 650$. For instance, using the $\times 10$ ocular in conjunction with this objective in the binocular body would give a magnification of approximately $\times 500$ whereas the $\times 15$ ocular used with the same combination would give a magnification of approximately $\times 875$, with a consequent blurring of the image.

STAGE CONTROLS

The microscope stage is focussed by co-axial controls situated on either side of the stand (Figure 1), the larger diameter providing the rapid motion and the smaller, the sensitive or fine motion.

The rapid control operates over a range of 12 mm and the fine control a further 12 mm of stage movement at any setting of the rapid control. To focus a specimen the stage should be brought to the top of its movement by the rapid control and the specimen finally focussed with the sensitive control. This establishes the 'auto focus' condition for setting subsequent specimens in the nominal focus position. When the stage is lowered for changing the specimen slide, the rapid control should be used to bring the specimen back to focus and only a slight touch of the fine adjustment will be needed to compensate for any difference that may occur in the thickness of individual slides. The two adjustments are coupled together through a friction clutch so that when the limit of movement in either direction is reached, no damage occurs to the mechanism and the sensitive control should be reversed to re-establish normal working.

The stage may be either a flat plate on which the specimen is held by spring clips or with mechanical motions to travel the specimen slowly in the horizontal and vertical directions. The controls are below the stage with co-axial milled heads. A horizontal milled head operates against a collar surrounding this pinion to clamp the controls at a required position, and this head should be loosened before the adjustments are operated.

SUBSTAGES

These are of the focussing type in two forms :
Non-centring. The inner tube is focussed up and down by a lever. The knurl headed screw holds the condenser firmly.

Centring. The focussing is by a rack and pinion adjustment. Centring is by two screws which operate against a spring plunger. This is eased by turning the outer milled clamping collar in the clockwise direction. To centre the condenser, the iris should be closed and the image of the small aperture focussed and observed through the microscope with a low power objective. The centring screws bring the image to the centre of the field of view and the clamping collar is then tightened up.

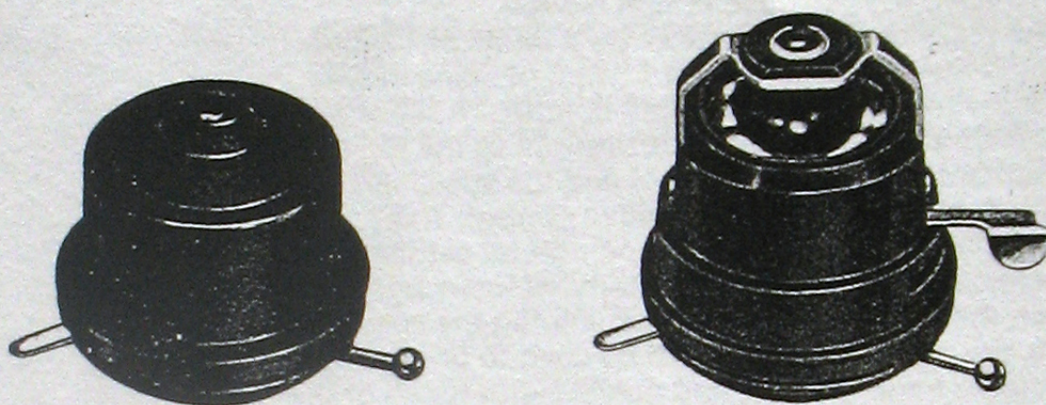


Fig. 3

CONDENSERS

The condensers shown in Figure 3 are of the Abbe type with numerical aperture 1.2. They are fitted with iris diaphragm and swing-out tray to hold colour filter or diffusing screen 32 mm diameter.

The fixed lens type, when used with low power objectives requires a diffusing screen to fully illuminate the field of view.

The advanced model has a flick-out top lens, which when out of the optical axis enables the condenser to operate at .68 N.A. to fully illuminate the field of low power objectives while maintaining an accurately focussed field aperture stop.

For full cone illumination of oil immersion objectives of aperture 1.0 N.A. or greater, the condenser must also be in immersion contact. A small quantity of oil should be dropped onto the top of the condenser lens which is then focussed upwards until oil contact is made with the slide.

ILLUMINATORS

The mirror is used with an external light source such as a pearl lamp placed about 10 inches from the base. It is attached to the microscope by pushing the mount firmly into the hole in the base.

The integral illuminators are of the simple and Kohler type. They are held in position by screwing the clamp ring onto the threaded tube of the illuminator passing through the hole in the base. The simple illuminator is fitted with 6 volt or 12 volt bulb to operate from a transformer or low voltage circuit or with 240 volt bulb to operate from the mains. The latter bulb is longer than the low voltage types and if

the illuminator is being converted from one to the other, the grey metal sleeve which is placed over the tube should be removed to enable the smaller bulb to be recentred to the axis of the microscope.

The lamps of this illuminator are held in a simple bayonet fitting and can be readily changed by pulling off the end of the illuminator without disturbing the microscope adjustments.

The Kohler illuminator employs a 6 volt bulb operating through a transformer. An iris diaphragm is incorporated to control the field of illumination, operated by a knurled ring on the tube close to the microscope base.

The lamp of this illuminator is of the prefocus type with end-on filament. It is removed by withdrawing the tubular holder from the lamphouse and unscrewing the clamping ring. The replacement lamp must be placed so that the slot in the flange locates onto the pin in the holder, the lamp held in this position against spring pressure and the clamp ring replaced. Replacements should be ordered under ref : 6161.

PHASE CONTRAST

An intense light is essential for this technique. The microscope should therefore be equipped with the Kohler illuminator or a separate high power lamp used in conjunction with the mirror.

As satisfactory phase contrast relies on perfect centration, a substage with these adjustments is also necessary.

The apparatus incorporates a corrected condenser and an iris diaphragm to permit normal transparent illumination to be obtained. The turret should be set at '0' for this work. When the iris diaphragm is closed to its smallest aperture, the image of the pinhole can be focussed with a low power objective. It should be brought to the centre of the field as explained on page 7 and the substage adjustment locked.

The iris diaphragm should then be opened fully and the required annulus selected by rotating the milled edge of the turret until the magnification factor of the objective to be employed appears in the small window and a click indicates that it is correctly located.

To adjust for phase contrast the lowest power phase objective should be used combined with its associated annulus. The substage should be focussed upwards to bring the condenser close to the slide and the objective also brought approximately to focus.

Remove the ocular and place the observing microscope in the body tube. By adjusting the drawtube of this microscope the images of the phase ring in the

FIG. 4
OBJECTIVE PHASE-RING

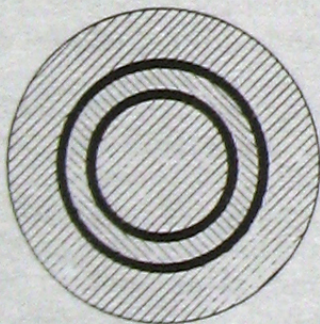


FIG. 5

objective and annulus will be clearly focussed. If they are not accurately centred to one another they will appear displaced as shown in Figure 4.

Insert the centring keys in the holes situated towards the rear of the condenser and turn until the annulus and phase ring appear coincident (Figure 5). When the observing microscope is exchanged for an ocular and the microscope focussed, the phase contrast image will be seen.

The above procedure should be carried out with each pair of objectives and annuli. Once completed they will remain well centred but should be checked from time to time with the observing microscope to ensure that true phase contrast images are continuing to be obtained.

DARK FIELD ILLUMINATION

An intense light is essential for this technique. The microscope should therefore be equipped with the Kohler illuminator or a separate high power lamp used in conjunction with the mirror. The centring substage is also necessary.

Initially the microscope should be employed with low power objective and ocular. The dark field condenser is fitted to the substage and a drop of immersion oil placed on the surface of the top lens. The specimen slide is placed on the stage and the substage focussed upwards until the spot of oil makes contact with the under-surface of the slide. The microscope is then focussed until a small illuminated patch is seen on the slide and the substage centring screws adjusted to bring this to the centre of the field of view.

If the condenser is out of focus a ring of light will be seen. The lever of the condenser is focussed to produce the patch of light and centring carried out as explained on page 7.

Accurate centration is important as if it is faulty the specimen will be only partly illuminated with oblique light and spurious effects will be obtained.

The $\times 100$ objective is then rotated into position, a spot of oil placed upon it and the objective carefully focussed until it makes contact. This can best be observed from the side. A touch of the fine adjustment should then bring the specimen into sharp focus.

For dark field illumination with objectives of power $\times 45$ or lower, the top lens of the condenser is screwed off. It is then used dry with objectives of maximum aperture of 0.65 N.A.

A colour filter giving approximately monochromatic light is useful to destroy the colour fringes which

would otherwise be present with this type of illumination. The specimen should be free from air bubbles and extraneous matter as the reflections from these may mask the image and destroy the dark ground effect.

EPIMAX MICROSCOPE

The instrument is basically similar to the Diamax, but as it is intended for opaque specimens, there is no condenser below the stage or integral lighting unit within the base. The illuminator fits to the circular dovetail at the top of the limb and itself possesses another dovetail into which the observing tube is inserted.

The illuminator employs a 6 volt bulb of the end-on filament type. Replacements should be ordered under ref: 6161 and the method of fitting is similar to that described on page 9.

Two iris diaphragms are fitted to the illuminator and are operated by levers in the horizontal tube. The nearer to the lamphousing is the 'field iris' which is set to make the illuminated area coincident with the visual image. The second is the 'aperture iris' which controls the contrast. It should not be employed to control the brightness of the image, this should be adjusted by the rheostat on the transformer. The iris diaphragm should restrict the objective aperture to about two thirds of its diameter, which condition can be checked by removing the ocular from the tube and observing the back lens of the objective. Failure to make this adjustment correctly will result in either (a) over-illumination, causing the image to be masked by glare, or (b) restriction of the aperture, causing loss of resolution.

A slot in the arm of the illuminator is used for carrying a polaroid disc or colour filter. When these are not being used the cover plate should be rotated to cover the slot to prevent extraneous light entering the illuminator.

Focussing is on the stage in a similar manner to the Diamax microscope. An auxiliary slide enables the stage of the Epimax to be lowered a further 60 mm to accommodate large specimens. The clamping screw should be loosened before attempting to adjust the stage position. The stage may be placed at any point in the length of the slide and the clamp screw tightened before the normal focussing adjustments are employed.

CARE OF THE MICROSCOPE

Whenever the microscope is not in use it should be protected from dust by replacing it in its cabinet or covering it with a cover of plastic or other material.

All optical components should be kept clean. Dust particles on the lens surfaces can be removed with a fine camel hair brush. Grease should be removed with lens tissue or a piece of well washed silk dipped in xylene or methylated spirits if necessary. This should be used to clean oil immersion lenses after use but should be employed sparingly to avoid the reagent acting upon the cement which is employed to hold the lenses in their metal mountings.

Microscope objectives should not be dismantled. In the event of internal damage or unsatisfactory performance they should be returned to us for correction.

Oculars can, if necessity arises, be cleaned internally after unscrewing the eye lens and the field lens. The components must be refitted to the tube by their appropriate threads otherwise the position of the internal fixed stop will no longer be correct.

Regular servicing maintains the microscope in efficient condition. We have a staff of expert servicing engineers operating throughout Britain and we shall be pleased to send details of the service upon request.

PROJECTION BASE AND HEAD

The lead should be wired in accordance with standard practice to a three-pin plug fitted with a 5 amp fuse. Switch on the left hand switch, whereupon the red indicator should light up, showing that the circuit is complete. Before removing the cover it is advisable to disconnect the plug from the mains socket. The cover protects the lamp, transformer, condenser, filter rack and field iris diaphragm and is removed by loosening two screws on each side, close to the surface of the baseplate. The tungsten halogen lamp, which is packed separately, must be fitted by inserting the two pins projecting from the lamp into the corresponding holes in the lampholder while the sides of the lower end of the bulb are carefully guided between two flat springs that project from the mica surface of the lampholder. Avoid fingering the surface of the quartz bulb and any grease or finger prints upon it should be cleaned off with a soft cloth with a little methylated spirit.

Next insert the condenser lens into the double rack nearest to the lamp with the bent-over tail piece facing towards the lamp. The heat absorbing filter is mounted in a square metal plate. This is inserted into the second compartment with the glass on the side away from the lamp.

Ensuring that the switches are both in the off position, replug into the mains and switch on. The lamp should light and can be set for focus and centration by the use of two screws, the heads of which are in the top of the lampholder adjacent to the lamp. The light falls on the aperture of the mirror unit close to the top of the base. By placing a sheet of brown paper over the aperture, the exact direction can be observed. Position the patch of light centrally by adjusting the screws mentioned above. Then, place the brown paper at a point about three inches above the top of the mirror unit and re-adjust the lamp screws until a reasonably sharp image of the lamp filament is formed on the paper when the field iris diaphragm is fully opened.

Now switch off the light and place the Diamax microscope with the hole in its base over the mirror unit and screw on the retaining ring. Attach the filter rack tube by fitting the spring slotted end over the retaining ring.

Switch the lamp on and place the brown paper against the iris diaphragm of the microscope sub-stage condenser. The lamp filament should fill the aperture of this and be reasonably in focus on it but it may be necessary to adjust the lamp screws again. Switch off and replace the cover of the projection

base, which is now ready for use.

For visual purposes the brightness selector switch should be set at 'DIM' and as this will still be too bright, one or more neutral or dense colour filters should be inserted in the rack. When used for projection, the switch should be set at 'BRIGHT'.

The projection head is attached to the Diamax stand by clamping on to the circular dovetail, the bodytube being removed. A slight re-adjustment of focus may be needed. The projection head contains an ocular with a nominal power of $\times 15$ and when the screen is viewed from a distance of 15 inches, the apparent size of the image and the fineness of detail will be similar to the image as seen directly with an ocular $\times 10$ in the monocular bodytube.

The mirror unit for projecting on to an external screen should be employed on the vertical monocular tube with the ocular in position. When the microscope has been focussed visually with the lighting reduced to an acceptable level, the mirror unit should be placed over and the lighting stepped up appropriately according to the magnification and projection distance employed. A slight degree of re-focussing will be necessary.

For optimum performance when projecting on to an external screen, employing the over-eyepiece mirror, the magnification of the objective should not exceed $\times 20$ when used in a well lit room. A magnification of about $\times 300$ will then be obtained with a throw of approximately 8 feet. In reduced lighting the $\times 45$ objective can be employed, in which case a magnification at this throw of approximately $\times 675$ will be obtained.

To use the $\times 100$ objective for projection it is essential that the room is fully darkened and that the specimens are not too dense. In this instance a magnification of approximately $\times 1500$ will be given at a throw of about 8 feet.

The No. 6133 condenser with flick-out top component is the most suitable type for the Diamax microscope when employed on the projection base, being used complete with the $\times 45$ and $\times 100$ objectives and with the top component removed when the $\times 10$ and $\times 20$ objectives are in use. Careful centration of the substage condenser is important. After focussing the object in the normal manner, close down the field iris diaphragm (which is in the projection base) to a pinhole and refocus until the enlarged image of this pinhole is seen, bringing it to the centre of the field by using the substage centring screws. The field iris diaphragm is then opened until the field of view is

fully filled with light. For the lower power objectives, $\times 3.5$ and $\times 5$, the No. 6456 condenser lens should be employed. This is placed in the top of the filter rack. The microscope substage condenser must be removed when this lens is used.

Regular cleaning of the optical components of the projection base is essential. The heat absorbing filter attracts fine dust particles and grease from the air and should be wiped clean, using methylated spirit, after each eight hours of use. It can be removed from its rack by actuating the left hand lever which projects from the base rear cover. The lamp bulb also collects dust and grease. It should be inspected after twenty-four hours' running time and cleaned with methylated if necessary. The lamp should be replaced when the bulb commences to darken. The aspherical condenser lens should be cleaned with methylated at the same time as the lamp. The mirrors, both of the projection base and the external projection unit, can be cleaned with cotton wool soaked in water containing a little detergent. All components should be cold before cleaning.

BECK

EALING BECK LTD

(FORMERLY R. & J. BECK LTD)

Greycaine Road, Watford WD2 4PW

Telephone: Watford 42261

Telex: 935726 Cables: Objective Watford

A black and white photograph of a woman with long hair, wearing a white lab coat, looking down at a microscope. The microscope is a compound light microscope with a grey body and black accents. The woman is holding a small slide in front of the microscope's stage. The background is a solid red color on the left and a light grey/white on the right.

BECK

DIAMAX

MICROSCOPE

'Designed for
the discriminating'

- A MICROSCOPE FOR
EDUCATION AND RESEARCH
- AN INEXPENSIVE
HIGH-QUALITY INSTRUMENT
- 'AUTO-FOCUS' CONTROL
- OUTSTANDING PERFORMANCE
- COMPLETE RELIABILITY

BECK

DIAMAX MICROSCOPE



Outfit 6352

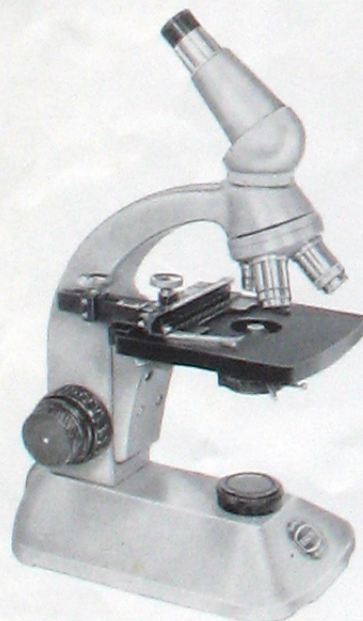
Recommended for science students and those taking degree courses up to 1st. year or equivalent. Diamax microscope, quadruple nosepiece, plain stage, focusing substage, inclined monocular viewing system, oculars x6 and x10, objectives x10 and x45, Abbe condenser, integral illuminator.

From the very first moment you handle a Diamax you will appreciate that it is a very fine microscope, and with rising enthusiasm note the purpose-designed features which make it so satisfying an instrument to use. In next to no time you will be congratulating yourself on making such a sensible choice and begin to feel some of the pride which we ourselves have in the Diamax. Into the design we have put every bit of experience we have gained in designing and manufacturing optical and scientific instruments over the past 125 years.

A unique feature of the Diamax is its versatile character which makes it equally suitable for the school science room or a research laboratory. This has been achieved by unit construction and providing a large range of alternative and interchangeable accessories. Thus, the Diamax is available to many specifications, and at a competitive price. For example in the simplest form, suitable for school science and first year medical studies, the Diamax has a quadruple nosepiece, plain stage, focusing substage and integral illuminator. By the addition or substitution of accessories it becomes a highly specialised instrument for research.

The microscope stand incorporates coaxial focusing controls which move the stage at rapid or slow rate to set the specimen at the correct distance from the objectives. The focusing mechanism incorporates the unique "Auto-focus" control which permits specimens to be interchanged and brought into focus by bringing the rapid control to a stop position. In this way it is possible to pursue the routine examination of many slides without the tedium of carefully refocusing the microscope to suit each specimen. Mechanical stages greatly assist systematic scanning as well as the location of features of specific interest and are available for the Diamax either as a built-in feature with coaxial understage controls, or as an attachable accessory for the plain stage model Diamax.

The viewing systems are accommodated at the top of the microscope stand, where they may be positioned radially to suit individual preference. We recommend the binocular viewing system for prolonged periods of use and the monocular system with extending drawtube for obtaining accurate compensation of cover glass thickness variation or facilitating the accurate calibration of a graticule placed on the field stop of an ocular. A fixed drawtube monocular viewing system, suitable for less stringent requirements, is also available.



Outfit 6353

Recommended for students taking degree courses 2nd. year and beyond. Diamax microscope, quadruple nosepiece, plain stage, focusing substage, inclined monocular viewing system, oculars x6 and x10, objectives x10, x45 and x90 oil immersion, Abbe condenser, integral illuminator. The illustration also shows the attachable mechanical stage, an optional extra, Cat. No. 3305.



Outfit 6354

For routine laboratory work. Diamax microscope, quadruple nosepiece, graduated mechanical stage, focusing and centring substage, inclined monocular viewing system with drawtube, oculars x6 and x10, objectives x10, x45 and x100 oil immersion, Abbe condenser, Kohler illuminator, transformer with rheostat, and case.

THE MICROSCOPE OF THE CENTURY —

Permanently aligned illumination by means of a low or mains voltage illuminator installed within the Diamax base, permits the microscope to be moved without re-setting, whether the illuminator chosen is the simple type suitable for educational purposes or the Kohler illuminator for more advanced techniques. A mirror is available for those preferring to use an external light source and, although the Diamax is primarily intended for the examination of translucent specimens, an incident illuminator for facilitating the examination of opaque objects is included in the range of illumination accessories.

The Diamax range of objectives have been specially designed to conform with the most modern conception of specification and performance, those described in this brochure having been selected from an extensive range which also includes apochromatic and "Aplanar" flat field objectives. The complete range of oculars includes compensating, widefield, and projection types, in addition to the standard oculars listed. Details of all objectives, oculars, condensers and other accessories are given in catalogue section E.

Consideration should be given to the "Tetravar" unit when choosing a Diamax. It not only facilitates simultaneous viewing and photomicrography, but by means of an additional body, permits two observers to view a specimen simultaneously. A specially adapted 35mm camera with a focusing frame-defining ocular can be attached to the Diamax by means of a straight monocular tube located in the recess at the top of the microscope stand or in a "Tetravar" unit.

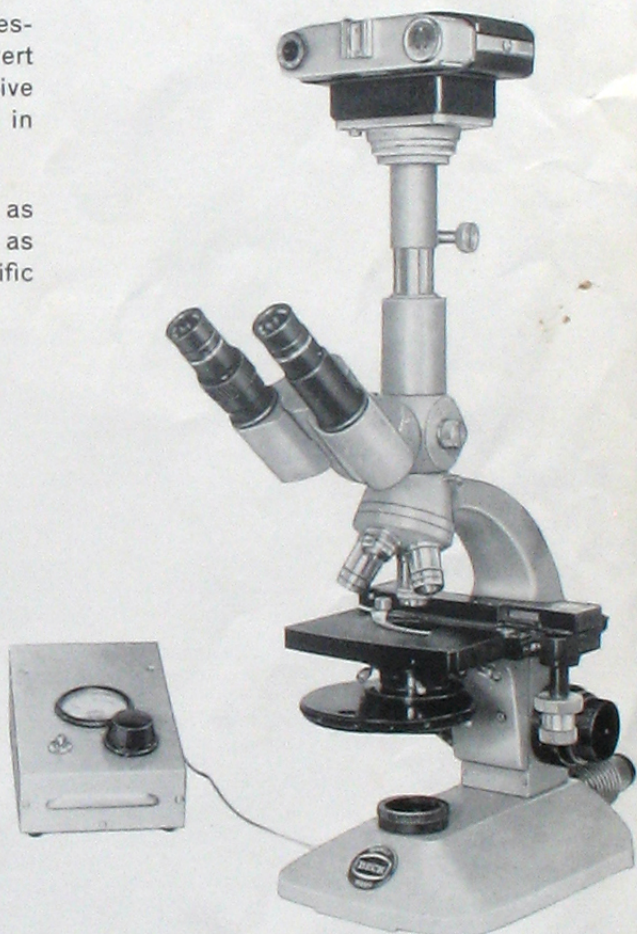
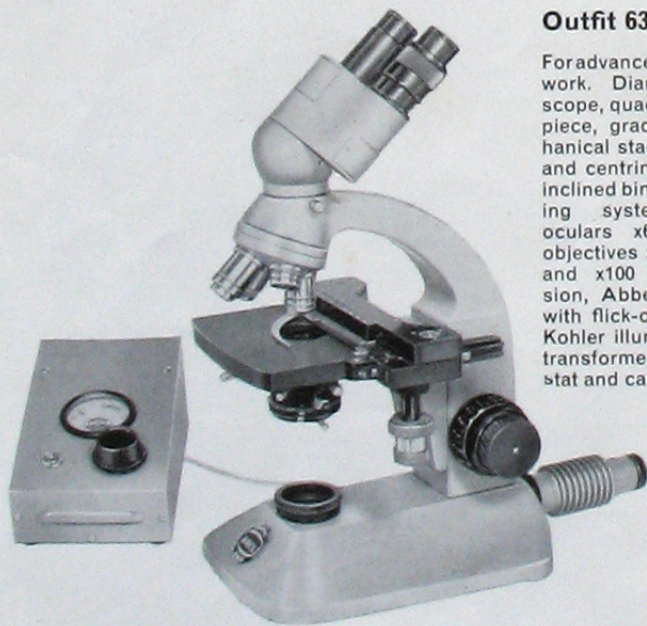
Phase contrast techniques are now being applied extensively in education and to satisfy this demand we offer an economic phase contrast outfit which utilises a x45 objective. This is listed as 6305.

Alternative phase contrast systems, polarization accessories, fluorescence apparatus, and condensers for darkfield techniques, will convert the Diamax into a comprehensive research microscope. Descriptive information regarding these and other accessories will be found in catalogue section E.

From the many possible Diamax assemblies, we have selected five as being most likely to meet general requirements and offer these as complete outfits with optics. If these outfits do not meet your specific requirements we invite your further enquiry.

Outfit 6355

For advanced laboratory work. Diamax microscope, quadruple nosepiece, graduated mechanical stage, focusing and centring substage, inclined binocular viewing system, paired oculars x6 and x10, objectives x3.5, x10, x45 and x100 oil immersion, Abbe condenser with flick-out top lens, Kohler illuminator, and transformer with rheostat and case.



Outfit 6356

For research work. Diamax microscope, quadruple nosepiece, graduated mechanical stage, focusing and centring substage, inclined binocular viewing system, paired oculars x6 and x10, objectives achromatic x3.5, phase contrast, x10, x45, x100 oil immersion, Abbe condenser with flick-out top lens, Kohler illuminator, transformer with rheostat, 35mm camera, x10 wide-field ocular, turret phase contrast system, Tetravar unit, straight monocular tube, and case.

DIAMAX MICROSCOPE SCHEDULE

OUTFITS:

		Price
6352	As illustrated	£64.10.0
6353	As illustrated	£78. 0.0
6150	Polished hardwood case for 6352 and 6353	£4. 4.0
6354	As illustrated	£150.16.0
6355	As illustrated	£188.10.0
6356	As illustrated	£322. 0.0

COMPONENTS:

6101B	Diamax microscope stand, quadruple nosepiece, plain stage and focusing substage	£35. 0.0
6101C	Diamax microscope stand, quadruple nosepiece, plain stage, focusing and centring substage	£35.10.0
6101L	Diamax microscope stand, quadruple nosepiece, graduated mechanical stage with 75mm x 50mm movement and focusing and centring substage	£62. 0.0
6110	Straight monocular tube	£4. 0.0
6111	Inclined monocular viewing system	£5.18.0
6112	Inclined monocular viewing system with adjustable drawtube (x1.25)	£12. 0.0
6113	Inclined binocular viewing system (x1.25)	£34. 0.0
6115	Tetravar intermediate unit	£22.14.0
6130	Mirror to fit Diamax base	£1. 6.0
6336	Integral illuminator 240 volts	£2.10.0
6337	Integral illuminator 12 volts	£2.10.0
6338	Integral illuminator 6 volts	£2.10.0
6339	Attachable Kohler illuminator 6 volts 15 watts	£24. 0.0
6170	Epimax incident light illuminator 6 volts 15 watts	£23. 8.0
6140	Spare lamp, 240 volts for 6336	2.2
6141	Spare lamp, 12 volts for 6337	3.6
6142	Spare lamp, 6 volts for 6338	4.5
6143	Set of 3 field control stops for use with integral illuminators	6.0
6144	Adjustable field control iris for use with integral illuminators	£1.12.0
2164	Transformer with rheostat and ammeter for Kohler illuminator and Epimax illuminator	£7. 4.0
6161	Spare lamp, 6 volts 15 watts, prefocus, for Kohler and Epimax illuminators	£1. 4.10
6150	Polished hardwood case for Diamax microscope	£4. 4.0

OPTICS:

6228	Achromatic objective x3.5/.07 N.A.	£6.14.0
6229	Achromatic objective x5/.12 N.A.	£4.10.0
6231	Achromatic objective x10/.25 N.A.	£5.16.0
6232	Achromatic objective x10/.17 N.A.	£4. 0.0
6233	Achromatic objective x20/.54 N.A.	£10.14.0
6235	Achromatic objective x45/.65 N.A.	£8.18.0
6238	Achromatic objective x90/1.00 N.A. oil immersion	£13.10.0
6239	Achromatic objective x100/1.30 N.A. oil immersion	£18.10.0
6400	Ocular x6	£2. 2.0
6401	Ocular x10	£2. 2.0
6402	Ocular x15	£2. 2.0
6132	Abbe condenser 1.20 N.A.	£4. 0.0
6133	Abbe condenser 1.20 N.A. with flick-out top component for low-power work	£8.16.0

ACCESSORIES:

3305	Attachable mechanical stage, 75mm x 25mm movement with scales and verniers	£15. 0.0
3293	Focusing darkfield illuminator in fitting for centring substage	£23. 0.0
6205	Phase contrast outfit, comprising condenser, x45 phase objective and substage annulus, fitted case	£31.14.0
6201	Turret phase contrast, with observing microscope, centring keys, green filter, fitted case	£42.10.0
2384	Polaroid for tray of condenser	£5. 0.0
5619	Analysers for Diamax microscope	£14. 0.0
3516	Tenslite microscope lamp complete with transformer and 6 volt 48 watt bulb	£23.10.0
6325	Diamax 35mm photomicrographic camera and x10 widefield ocular with frame defining graticule	£42. 0.0
6415	x10 Widefield ocular to pair with ocular supplied with 6325 for binocular viewing	£7. 0.0



Diamax fitted with an inclined monocular body, Tetravar unit (6115) and straight monocular tube (6110) supporting the 35mm photomicrographic camera (6325). The x10 widefield ocular with frame defining graticule supplied with the camera is shown inserted in the monocular body.



Turret phase contrast system (6201) incorporating four annuli for use with x10, x20, x45, x100 phase contrast objectives, details of which are given in catalogue section E, obtainable on request.



Diamax analyser (5619), accommodated in the recess at the top of the microscope stand, has provision for an ocular tube or Tetravar unit. Full details of the accessories shown above and many other items are given in Catalogue Section E.

R & J BECK LIMITED

BUSHEY MILL LANE, WATFORD, HERTS. Telephone: Watford 42261