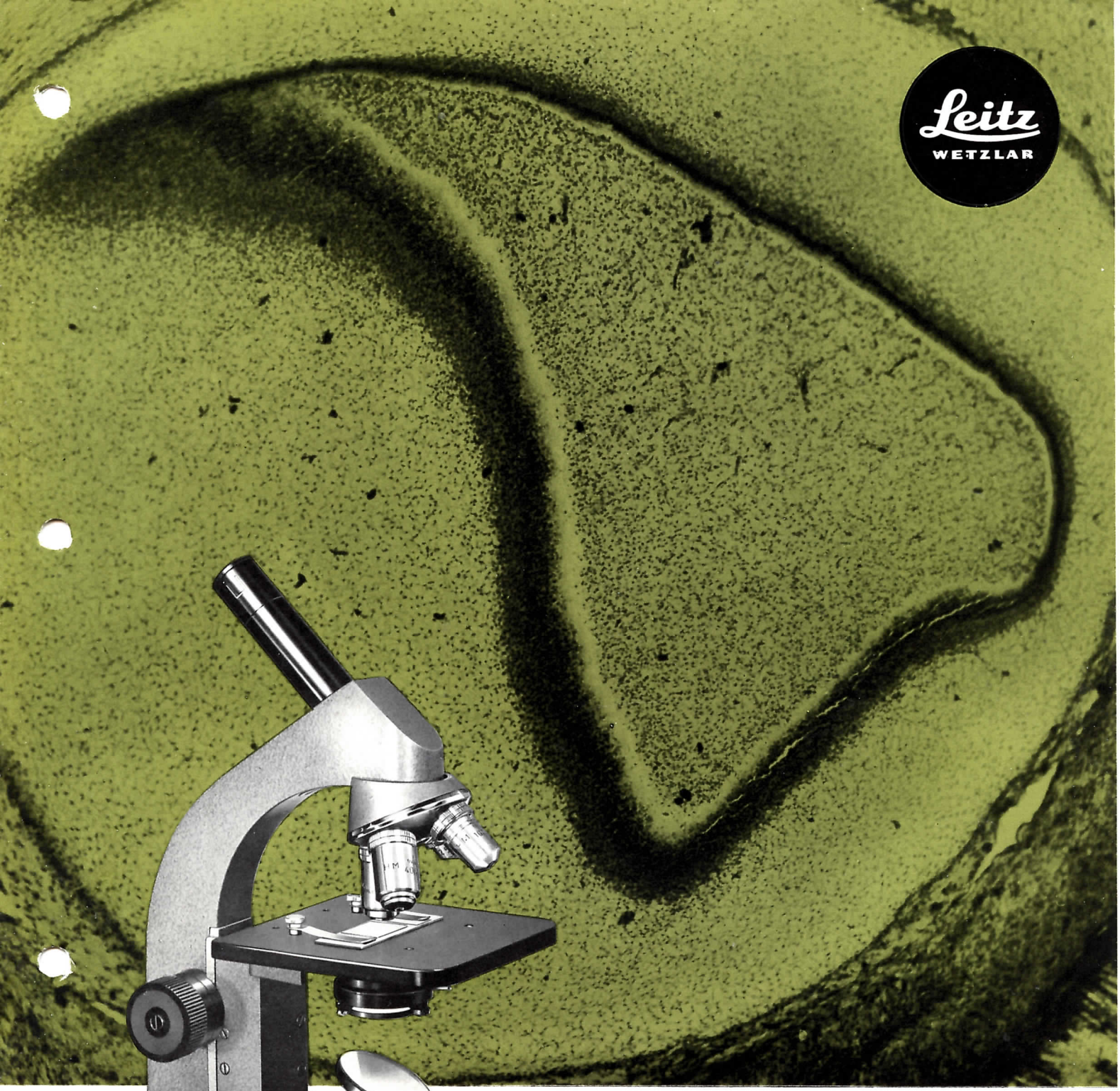


# HM classroom and students' microscope

ERNST LEITZ GMBH WETZLAR

512-63 c/Engl.

Leitz

# HM

**classroom and students' microscope**

- **Robust, firm stand made of non-corroding light alloy**
- **Inclined monocular tube, ensuring strain-free observations**
- **Maintenance-free single-knob focusing control**
- **Quadruple revolving nosepiece for well-corrected objectives**
- **Medium- and high-power objectives with spring-loaded mount for front-lens protection**
- **Large, always horizontal object stage**

**On request:**

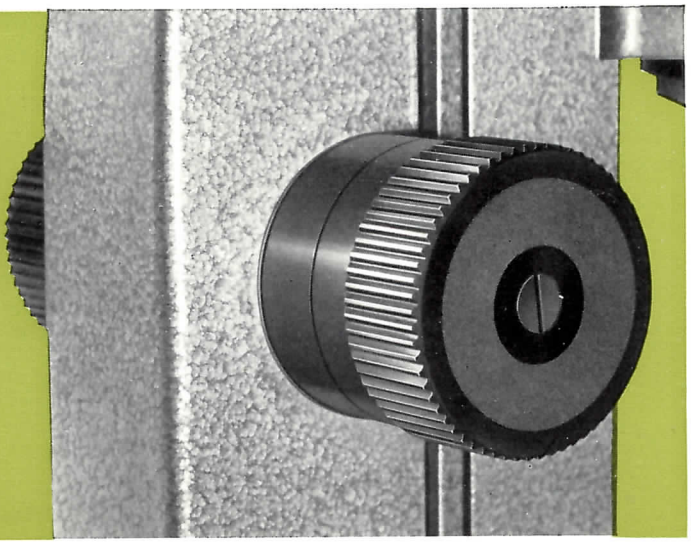
- **Attachable specimen guide with co-axial controls for the stage movement**
- **Choice of single-lens and two-lens condensers**
- **Powerful 15W micro-dia lamp or 6v 15W low-voltage lamp interchangeable with mirror**

The HM microscope is a simple, yet reliable and excellent stand for general examinations. It is particularly suitable for teaching purposes in schools, universities, medical schools, technical colleges, etc. As a result, a design was chosen which stands up to roughest handling in schools and classrooms. Even after many years' use the microscope, which needs no maintenance at all, will function as perfectly as on the first day.

Objectives, eyepieces, and condensers are interchangeable. The optical outfit can therefore be made up to suit individual requirements.

A range of accessories completes the equipment of the HM. Thus a stand bought initially with the simplest outfit can be equipped with a lamp attachment, an attachable specimen guide etc. at any time. However, the costly changing facilities for tubes, revolving nosepieces, stages, etc. which are standard features of our larger stands have not been provided.


Precision revolving nosepiece with 4 achromats



Single-knob control of the HM

## Stand

The smoothly designed stand is made of non-corroding light alloy. Its rugged construction and firmness will stand up to rough handling. The bilateral single-knob coarse-and-fine focusing control is built into the stand and runs on ball bearings.
The focusing mechanism remains unaffected when the stand is carried.

## Tube

An inclined, monocular tube is permanently attached to the stand. Angle of observation 45°. It allows the user to work in a strain-free, natural posture. The level of the observation tube remains unchanged during focusing, as the focusing mechanism acts on the object stage.

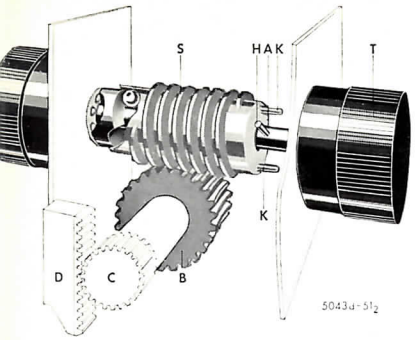


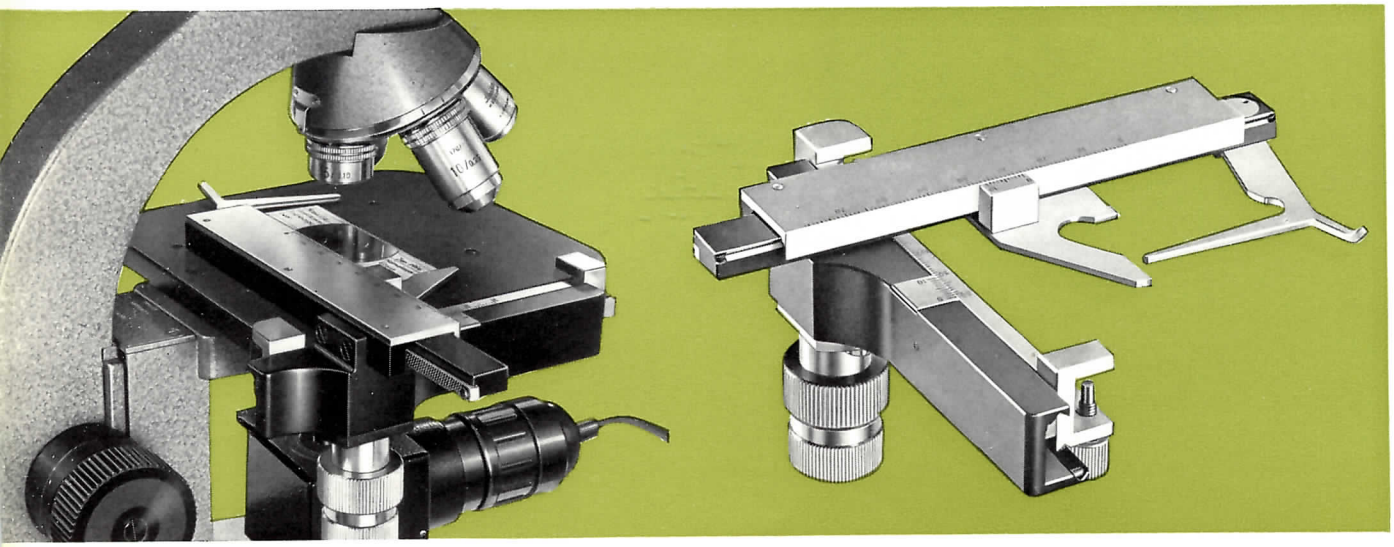

Diagram of the single-knob control

## Maintenance-free, single-knob focusing

The focusing mechanism moving on ball bearings with tempered and ground guide tracks is based on a single-knob control on both sides of the stand for the coarse and fine adjustment of the image. The smoothness and absolute freedom from play of its movement are its outstanding characteristics. Coarse and fine focusing of the microscope image is carried out with a single knob. By turning the knob continuously in one direction only the mechanism functions as a coarse adjustment. When the direction is reversed the fine adjustment is automatically engaged; its range covers about $^1/_3$ turn of the knob; turning it beyond the slight resistance at both ends of the fine adjustment again engages the coarse adjustment. Correspondingly, any change in the rotating direction brings the fine adjustment into play. This type of focusing has been found most efficient also with larger stands. It allows rapid and accurate adjustments even at the highest magnifications. **No maintenance** is required. Greasing, lubrication, and periodical overhaul is unnecessary.

### Function

The worm S is loosely mounted on a shaft A along which it can move within a narrow distance. Drive knob T is rigidly attached to the shaft A. As soon as the drive pin H on the shaft A engages one of the stops K, the worm S is rotated directly. This movement is immediately transmitted to the worm wheel B and via the pinion C to the rack D. The drive knob T therefore actuates the coarse adjustment due to the direct transmission. By reversing the direction of rotation the worm S is displaced along the shaft through a very short distance due to a mechanism consisting of an inclined plane and ball; this movement causes a very slight rotation of the worm wheel B and the pinion C which in turn raises or lowers the rack D through a minute distance. Drive knob T now actuates the fine adjustment and will continue to do so as long as the drive pin H moves freely between the two stops K.

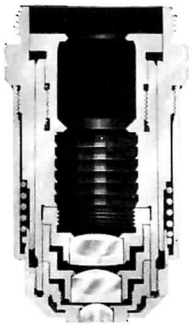


Object stage No 19 with specimen guide No 21 in position

Specimen guide No 21

## Object stage and specimen guide

The object stage No 19 is rigidly mounted on the stand. Its area of 130x125mm is suitable even for large specimens. The object stage always remains horizontal, so that liquids such as immersion oil cannot run off. The attachable specimen guide No. 21 is particularly recommended for the rapid and systematic scanning of specimens. The right hand operates the coaxial drives for the mechanical movement, while the specimen is refocused if necessary with the left hand by means of the single-knob control. The specimen guide has a traversing range of 76x26mm, and has a mm and vernier scale for the easy location of certain features of the specimen. The specimen guide can be removed from the stage within seconds so that the entire stage will rapidly be available for large specimens.



Longitudinal section
through the 40/0.65 objective


The most widely used 4 objectives for the HM

## Objectives and eyepieces

Five achromats of good optical quality are available. They have been chosen so that all magnifications reasonably to be expected of a microscope can be obtained: 1000x magnification is the upper limit which demonstrates the minute structure of microscope specimens; at the lower limit of 35x magnification even relatively large and thick sections can be examined. The medium and high magnifications of 100x, 400x, and 630x are suitable for the most varied objects in botany, zoology, and medicine. The Huygens 10x eyepiece is the standard eyepiece. Additional magnifications are possible with the Huygens 6x eyepiece, which is available on request. All objectives are parfocal on the nosepiece, requiring, if any, only negligible refocusing with the fine adjustment after a change of magnification. The medium- and high power objectives have a spring-loaded front mount to protect the front lens.

Condenser No 65

Condensor No 66

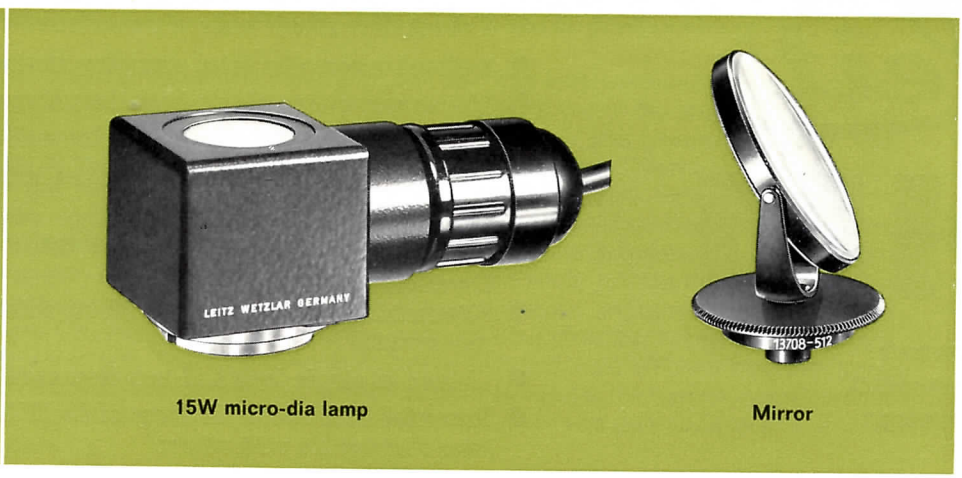
## Condensers

The condenser is used for the uniform illumination of the microscope field of view. It is mounted in a sleeve below the object stage. Any vertical adjustment which might become necessary for the perfect illumination of the field of view is carried out simply by sliding the condenser in its sleeve.

Single-lens condenser No. 65, numerical aperture 0.65, with iris diaphragm, filter holder, for low- and medium power objectives.

Two-lens condenser No. 66 numerical aperture 1.20 with knurled screw, iris diaphragm and filter holder for all achromatic objectives including oil immersion objectives.

6v/5W low-voltage lamp




15W micro-dia lamp

Mirror


Bayonet changer for the illuminators built into the foot

## Illumination

For all microscopical examinations efficient illumination is indispensable.
The illuminating mirror with a plane and a concave surface is suitable for work with low and medium magnifications. However, for work to be carried out independently of the lighting conditions prevailing in the laboratory or at high magnifications, a lamp attachment is recommended which replaces the mirror in the foot of the microscope, where it is immediately centred on insertion. The 15W microdia lamp for direct mains connection or the 6v 15W low-voltage lamp which is connected to the mains through a transformer are available as light sources. The brightness of the low-voltage lamp can be regulated in steps.

## Cabinet

The microscope is supplied in a handy transport and storage cabinet on request. A flexible, transparent dust cover is also available.

Design subject to alteration without notice.

Leitz WETZLAR

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