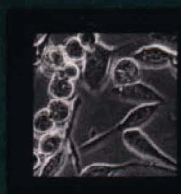
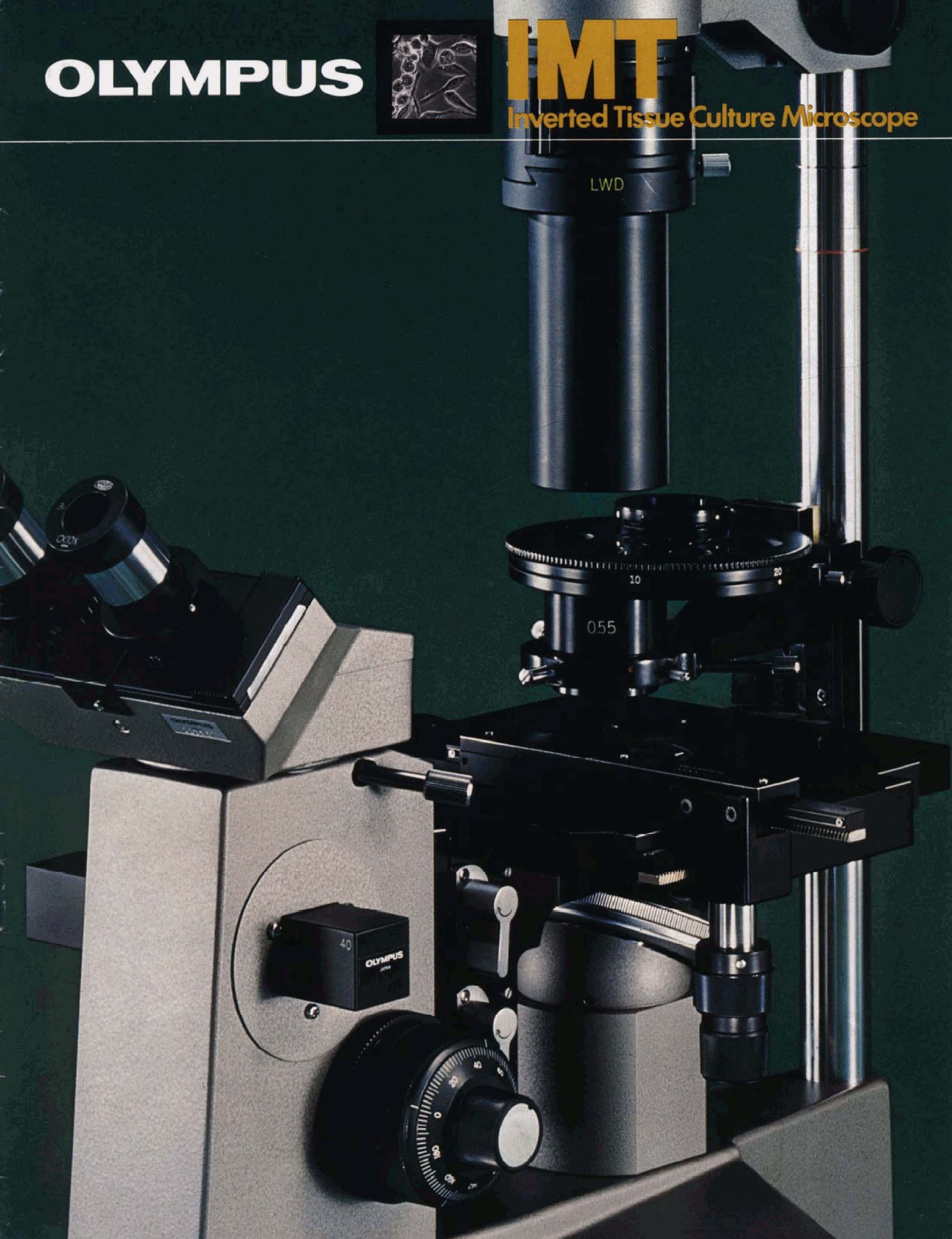


OLYMPUS



IMT

Inverted Tissue Culture Microscope



The Olympus Inverted Tissue Culture Research Microscope Model IMT

A Versatile, High-Performance System

For the first time a system microscope has been designed to take full advantage of the capabilities of the inverted microscope. In both routine and research studies, the Model IMT offers a number of advantages:—

Maximum Convenience

Olympus has designed this system carefully using human engineering principles. Because of this, the Model IMT is extremely easy to use, which reduces operator fatigue when employed for long periods. In addition, the Model IMT can easily accept a large variety of cell and tissue culture vessels, from ordinary glass slides to Petri dishes and flasks, allowing the microscopist to select the vessel best suited for tissue culture requirements.

Outstanding Versatility

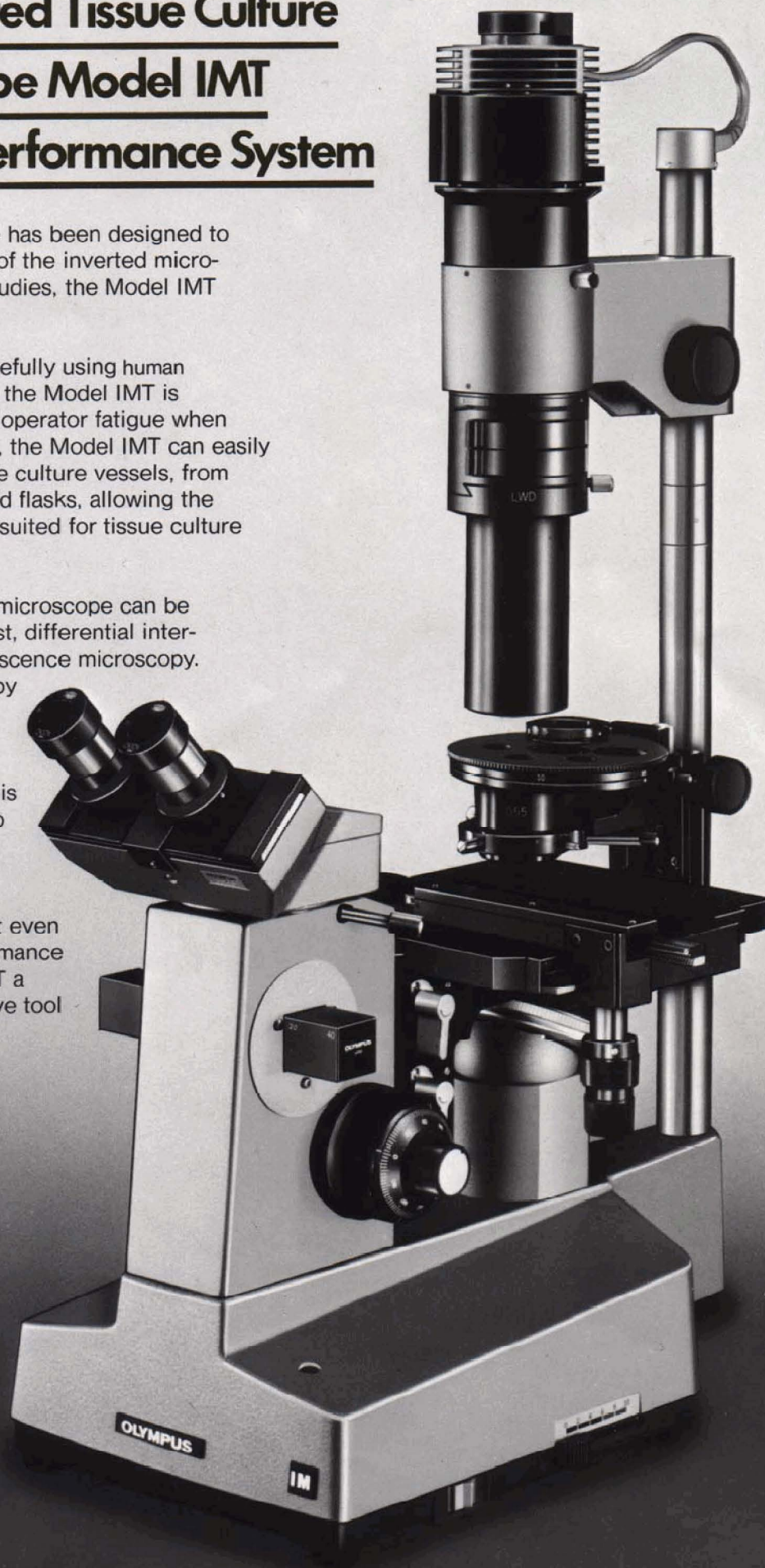
The techniques for which this system microscope can be used include brightfield, phase contrast, differential interference contrast, polarizing and fluorescence microscopy.

The system can be built up gradually by adding easily attachable modules to the basic microscope whenever different techniques are required.

In addition to reducing initial outlay, this allows the Model IMT to be adapted to meet an extensive range of different requirements.

Olympus Superb Quality Optics

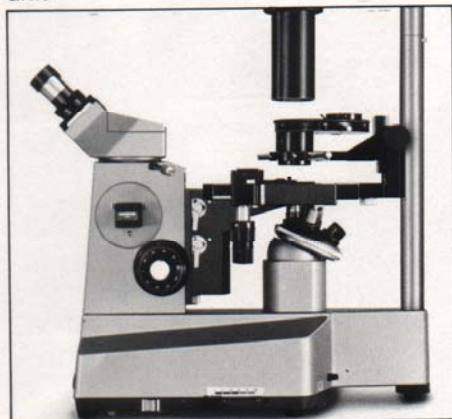
Use of high quality optics ensures that even the most stringent demands on performance can be met. This makes the Model IMT a powerful and wide-ranging investigative tool in such diverse fields as medicine, chemistry, biology and oceanography.



Special Advance Features

Stable Stand

The sturdy stand is of optimum size for all methods of observation and is stable enough to support a large photomicrographic and cinemicrographic unit.



Functional Design

The low stage allows a direct view of the specimen from a comfortable seated observation position. Focusing adjustment, stage drive and dimmer controls are all located in the most convenient positions for fatigue-free observation over extended periods. In addition because image movement is in the same direction as specimen movement, manipulation is simplified.



Flexible Modular Construction

A wide variety of modular units enables the Model IMT to perform phase contrast, differential interference contrast, polarizing and fluorescence microscopy, as well as brightfield observation. Also, a choice of observation tubes and mechanical stages provides for flexibility in meeting the needs of individual users.

Efficient, Economical Optical System

Special objectives are not required for phase contrast techniques, because the optical system of the Model IMT is designed to allow the phase ring to be inserted in the body of the microscope. This makes the Model IMT

more competitively priced and enhances its performance and application potential.

Choice of Three Condensers

In addition to standard condensers for general specimens, two other condensers with working distances of 20mm and 55mm, respectively, are provided. This allows culture vessels of different shapes to be used. The 20mm working distance condenser, for use with the IMT-LWD auxiliary condenser, has centerable annuli for 10X, 20X and 40X objectives and an opening for brightfield microscopy mounted in a revolving turret.

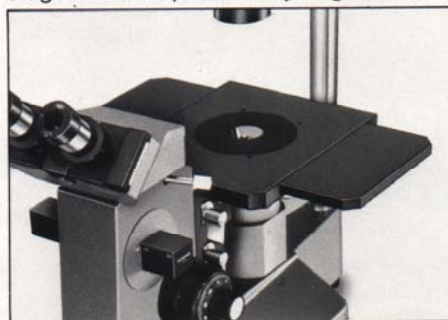


The 55mm working distance condenser has three centerable annular diaphragms, in slide-in mounts, for objectives of 10X, 20X and 40X magnification.



Large Stage

The large 160x190mm stage adapts readily to different culture vessel dimensions. Two accessory stage inserts are available for smaller vessels and extension plates ensure that the stage will hold particularly large flasks.



Some models include an attachable mechanical stage (scanning area 50x76mm), with control knobs below the stage, for easier manipulation.

Three specimen holders are supplied with this stage.

High Performance, Long Working Distance Objectives

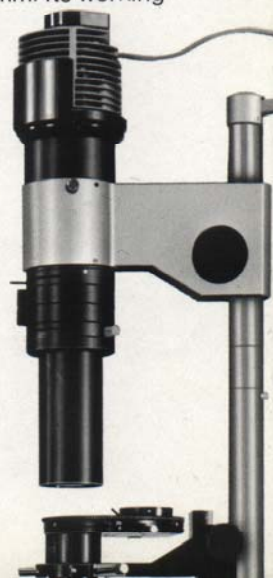
Four special objectives (4X, 10X, 20X and 40X) are provided. The 20X objective, N.A. 0.4, has a particularly long working distance of 5.5mm. Correction for glass thickness of 1mm results in extremely sharp images, even through



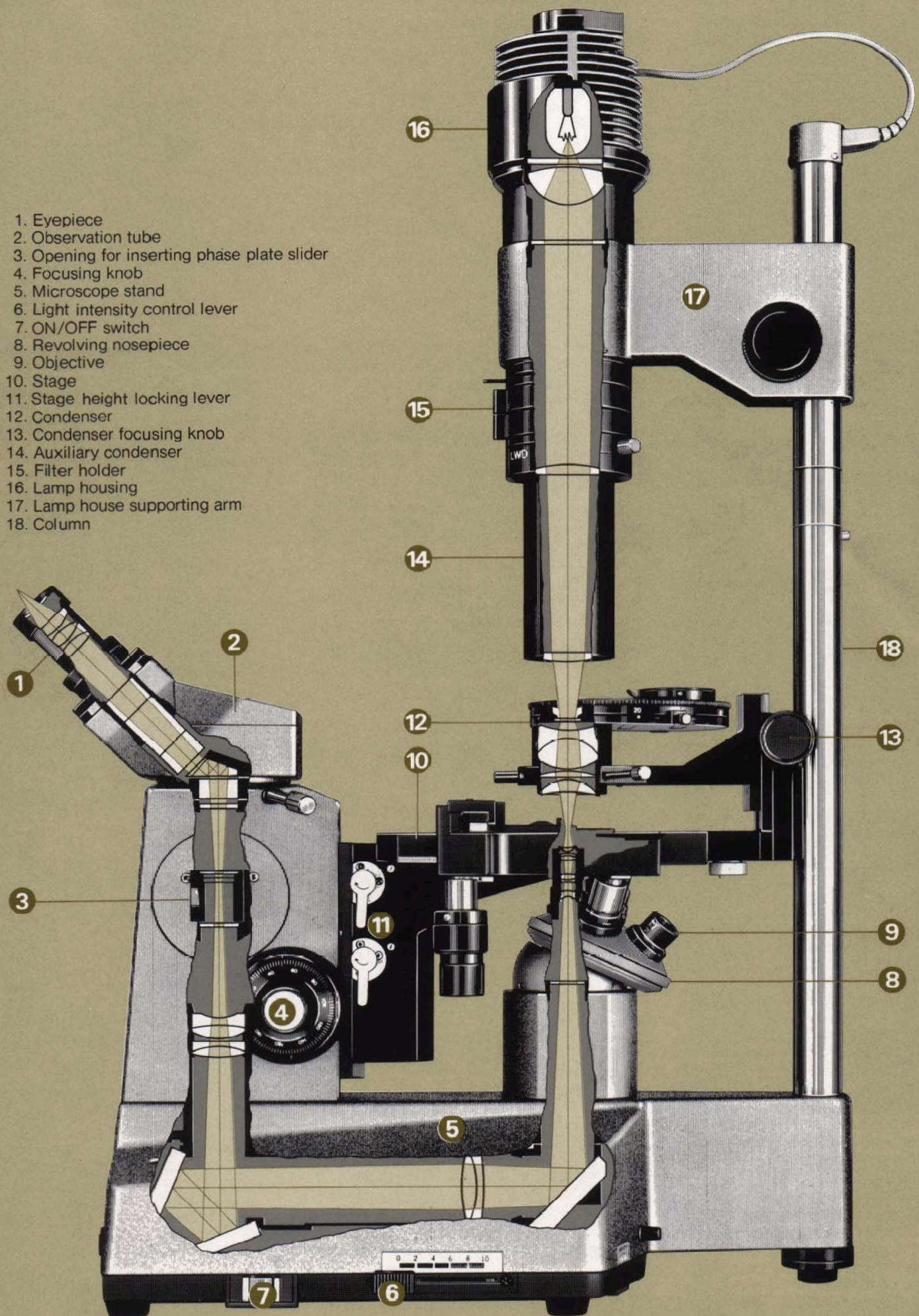
culture vessels. The plan achromatic 40X objective is corrected for field curvature and its correction collar allows maximum resolution over a glass thickness of 0.7–1.3mm. Its working distance of 2.0mm is extremely long for a lens with this magnifying power. The numerical aperture is 0.55.

Ideal Light Intensity

The 30W tungsten lamp assures bright, uniform illumination for almost all methods of observation. Where higher intensity is required, an optional 100W halogen lamp is available.



1. Eyepiece
2. Observation tube
3. Opening for inserting phase plate slider
4. Focusing knob
5. Microscope stand
6. Light intensity control lever
7. ON/OFF switch
8. Revolving nosepiece
9. Objective
10. Stage
11. Stage height locking lever
12. Condenser
13. Condenser focusing knob
14. Auxiliary condenser
15. Filter holder
16. Lamp housing
17. Lamp house supporting arm
18. Column

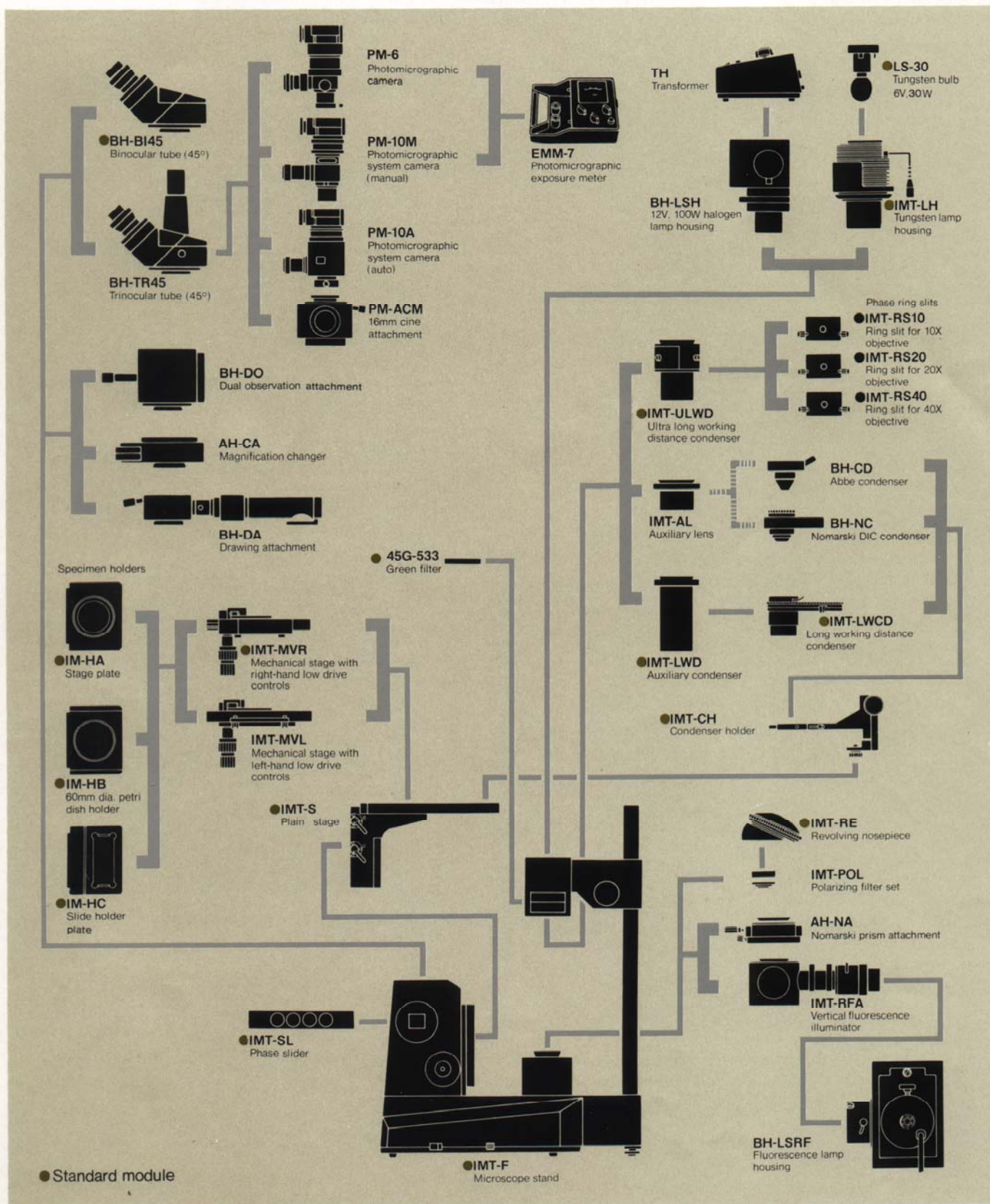


Specifications & Combinations

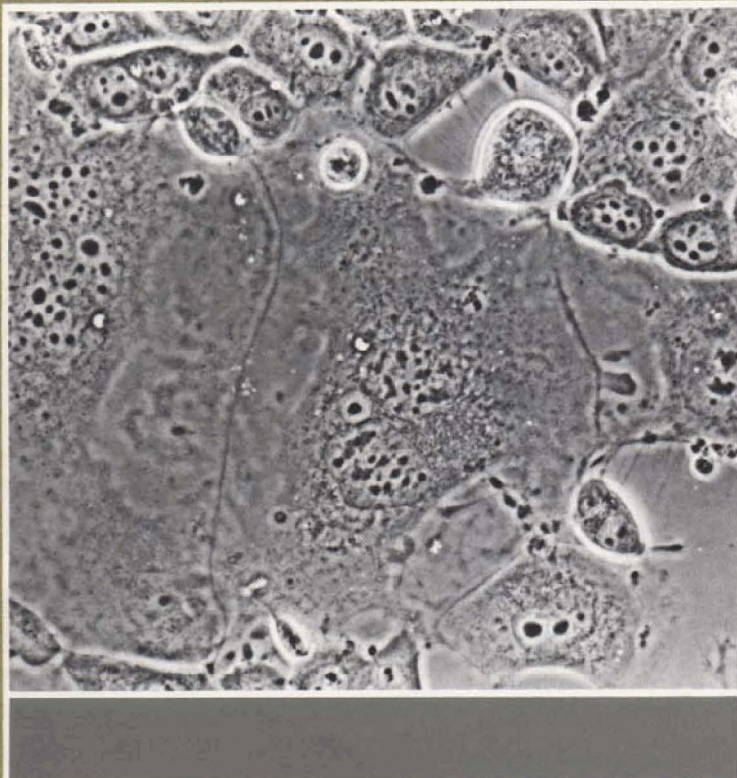
Components	Specifications	Models			
		IMT-201	IMT-203	IMT-211	IMT-213
Microscope stand IMT-F	- Coaxial coarse and fine adjustment knobs. - Focusing range 40mm, for both coarse and fine adjustment, on ball guides. - Fine adjustment graduated in 2μ increments. - Pre-focusing lever for coarse adjustment. - Tension adjustment for coarse adjustment. - Stage height locking lever. - Opening for inserting phase slider IMT-SL. - In-base transformer (0 to 10V), "on-off" switch with pilot lamp and graduated sliding control lever for light intensity. - Column and lamp house supporting arm with filter holder.	1	1	1	1
Revolving nosepiece IMT-RE	Quintuple; on ball bearings, with positive click stop action.	1	1	1	1
Lamp housing IMT-LH	Provision for 6V 30W tungsten bulb LS-30.	1	1	1	1
Tungsten bulb LS-30	6V 30W, pre-centered.	3	3	3	3
Binocular observation tube BH-BI45	- Inclined 45°, interchangeable with other tubes. - Rotatable through 360°, on circular dovetail. - Diopter adjustment rings on both eyepiece tubes to compensate for difference in individual eye acuity and tube length variations at different interpupillary distances between 53mm and 72mm.	1	1	1	1
Stage IMT-S	- Square, plain, 160mm×190mm, attachable. - Two stage insert plates, 90mm dia. with 60mm dia. aperture and 60mm dia. with 30mm dia. aperture. - Two extension plates.	1	1	1	1
Mechanical stage IMT-MVR	- Low positioned coaxial control knobs; stage excursion is 50mm×76mm, with verniers reading to 0.1mm. - Attachable to either right or left hand side of the stage. - Three specimen holders.			1	1
Condenser holder IMT-CH	- Attaches plain stage. - Condenser carrier with centering device. - Condenser height adjustment by rack and pinion, range 36mm. - Accepts long working distance condenser IMT-LWCD, ordinary condenser BH-CD or BH-AAC.		1		1
Condensers	Long working distance condenser IMT-LWCD				
	- W.D. 20mm, N.A. 0.55 - Revolving turret incorporating 4 centerable light annuli matching objective magnifications of 10X, 20X, 40X and 100X (*) and one full aperture and iris diaphragm for brightfield.		1		1
	Auxiliary condenser IMT-LWD				
	For use with IMT-LWCD above.		1		1
	Ultra long working distance condenser IMT-ULWD				
	- W.D. 55mm, N.A. 0.32. - Opening to accept phase ring slit IMT-RS10X, 20X or 40X.	1	1	1	1
Phase ring slits IMT-RS10, RS20 and RS40	In centerable slide-in mount.	1 ea.	1 ea.	1 ea.	1 ea.
Phase slider IMT-SL	- Three phase plates for 10X, 20X and 40X objectives and one blank position for brightfield. - Positive low contrast.	1	1	1	1
Objectives	Achromatic dry objective 4X/0.10, W.D. 19.0mm.	1	1	1	1
	Achromatic dry objective 10X/0.25, W.D. 7.0mm.	1	1	1	1
	Long working distance achromatic dry objective LWD C20X/0.40, W.D. 5.5mm; corrected for 1mm glass thickness.	1	1	1	1
	Long working distance plan achromatic dry objective LWD CPL40X/0.55, W.D. 2.0mm; with correction collar which permits correction over a glass thickness of 0.7mm to 1.3mm.		1		1
Eyepieces	High eyepoint, widefield, CK BiWF10X, paired, with field number of 17.2.	1	1	1	1
Centering telescope for phase ring alignment CT-4		1	1	1	1

*Only for standard phase at this magnification, and phase objective 100X should be used.

Modular Design for Wide Range of Applications

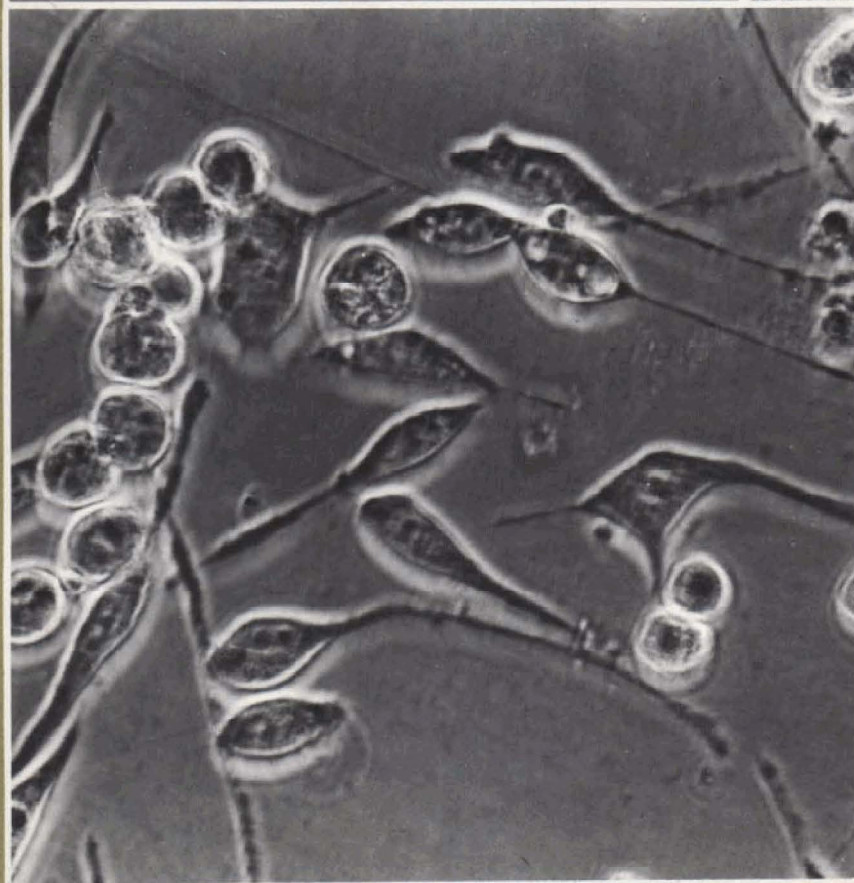
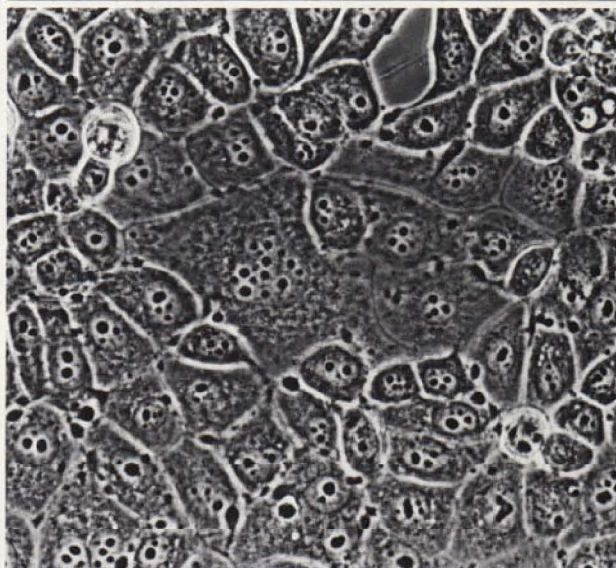


Outstanding Results with the Model IMT



Rat liver cells transformed by Nagisa culture and by the treatment with DAB:
Green filter (45G-533)
LWD CPL 40X and FK 2.5X, ASA 4.5,
IMT with PM-10A.

Rat liver parenchymal cells:
Green filter (45G-533),
LWD CPL 40X and FK 2.5X,
ASA 12, IMT with PM-10A.



Liver cells from normal rat:
Green filter (45G-533)
LWD CPL 40X and FK 2.5X,
ASA 6, IMT with PM-10A.

Rat peritoneal living cells:
Green filter (45G-533)
LWD CPL 40X and FK 2.5X,
ASA 12, IMT with PM-10A.

Photomicrographic Equipment



Photomicrographic System Camera Model PM-10

The photomicrographic equipment Model PM-10 is a system camera with various attachments to obtain sharply focused pictures on standard 35mm film, $3\frac{1}{4}'' \times 4\frac{1}{4}''$ Polaroid film, or $4'' \times 5''$ size film. A bayonet mount permits convenient and rapid interchange of data imprinting 35mm camera backs for B & W and color work. The Model PM-10 system consists of two basic units—Model PM-10A, a fully automatic version and a popular manual version, Model PM-10M.

The Model PM-10A permits automatic and continuous selection of correct exposure between 1/100 second and 32 minutes for ASA speeds 6 to 1600 in case of 35mm films, and 6 to 3200 in case of larger size films. The color temperature of the light source can be regulated according to your preference or the characteristics of the film used, to ensure accurate and stable color

reproduction. For 35mm photography, a camera with automatic film advance (C35A-DA) is standard.

The Model PM-10M has 9 shutter speed settings from 1/250 second to 1 second, plus B. A camera back with manual film advance (C35-DA) should be used for 35mm photography. In color photomicrography, it is particularly important to determine the correct exposure and to regulate the color temperature. For these purposes, it is recommended that the Model PM-10M be used with the photomicrographic exposure meter the Model EMM-7.

Magnifications on the film surface:

35mm film ● With photo eyepiece FK
(Objective power) $\times$ (FK power)
● With eyepiece P
(Objective power) $\times$ (P power) $\times$ 0.5 (approx.)

Larger films ● With photo eyepiece FK
(Objective power) $\times$ (FK power) $\times$ 3
● With eyepiece P
(Objective power) $\times$ (P power) $\times$ 1.5 (approx.)



Photomicrographic Camera Model PM-6

The Model PM-6 accepts all standard 35mm B & W or color films. The shutter, which floats on a cushioned mount to prevent vibration, has nine speed from 1/250 second to 1 second (plus B). It is also synchronized for electronic flash. The camera back incorporates an automatic film counter and data imprinting facilities. Magnification on the film plane is 0.4 times the total magnification of the microscope. A built-in focusing eyepiece with diopter adjustment from +2 to -8 ensures accurate framing and focusing by keeping the image visible throughout the exposure. A light measuring port is provided for the Model EMM-7 exposure meter as well as a locking cable release.

Photomicrographic Exposure Meter Model EMM-7

Used with the Models PM-10M and PM-6, it permits accurate control of both exposure time and color temperature. Film speed settings range from 6 to 400 (3000) ASA for all color and B & W films. Exposure time can be directly measured over a range of 1/250 to 32 seconds for standard 35mm films, and 1/30 to 123 seconds for large format films. The color temperature regulator provides fine

adjustment in 4 steps regardless of the type of film used.

The Model EMM-7 comes complete with a meter, CdS exposure and color temperature measuring probes, color compensating filters LB-45 and LBD, a filter mount, and a light shield. Neutral density filters ND6, ND12, and ND50 are available as optional accessories.



Accessories



Attachment for 16mm Cinemicrography Model PM-ACM

This is an attachment for 16mm cinemicrography of living cells, blood corpuscles, etc. and permits time lapse photography with intervals up to one frame per 160 minutes. The camera accepted by this attachment are the Bolex H-16M or H-16X. Both feature automatic exposure, color temperature compensation and electronic shutter.

Halogen Light Source Model BH-LSH

A 12V, 100W, high intensity halogen lamp provides optimum brightness. It is ideal for most types of microscopy, including phase contrast, differential interference contrast, polarized light, photomicrography, and cinemicrography, where a bright and constant source of illumination is required.



Polarizing Filter Set Model IMT-POL

This filter polarizer and filter analyzer set is for easy detection of birefringent substances in the specimen.



Differential Interference Contrast Attachment for Transmitted Light Model BH-NIC

A serious disadvantage of normal phase contrast techniques is the problem of halos, which lower resolving power. Differential interference contrast provides an ingenious answer to this difficulty. As with phase contrast, it is used for observation of living tissues



and unstained specimens, but it produces a more sharply defined, relief-like image with excellent contrast. For some specimens, however, phase contrast may be more advantageous, so the turret also incorporates light annuli in addition to the DIC optics.

for which it is primarily intended. Different specialized objectives are required for differential interference and phase contrast techniques. Condenser: Aplanatic/achromatic N.A. 1.40

Condenser Set Model BH-CD/IMT-AL

This combination of condenser BH-CD and auxiliary lens IMT-AL is ideal for brightfield observation of an ordinary specimen. The BH-CD is an Abbe type condenser with N.A. 1.25, the same as used with the BH Series System microscope.



Incubator Model IM-CB

This incubator will maintain the specimen temperature at any desired level to $\pm 1.0^\circ\text{C}$ of ambient temperature between 15°C and 37°C . Temperature is maintained by a small heater and fan, and because the incubator is made of transparent acrylic plastics material, it permits easy, unobstructed viewing and handling of both specimen and microscope.



Besides the listed above the following accessories are also available.

Dual Observation Attachment Model BH-DO

Drawing Attachment Model BH-DA

Magnification Changer Model AH-CA

Micro-Projection Screen Model BH-MPS

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