



# Microscope Catalog





## How To Use This Catalog

Certain often-used complete microscope configurations have been assigned specific product numbers to facilitate ordering. Other more unusual but important configurations are suggested in this catalog, but any desired assembly can be made from our large selection of interchangeable accessories.

### Key to Nomenclature

First letter denotes type of Body  
Second letter denotes type of interchangeable Body Tube  
Third letter denotes type of interchangeable Stage

Fourth letter or letter group (following hyphen) denotes type of Microscope Base

### Examples:

SBR-Cb/D6 (S-Cb stand with 6-volt dimmer base; "B" binocular body tube; "R" stage)

SUP-Kt (S-Kt "COMPACT" stand; "U" trinocular body tube; "P" plain stage with no mechanical movement)

LFR-Ke Photoscope (L-Ke Stand; "F" trinocular body tube; "R" stage; flatfield objectives)

### Prefix Designations for Nikon Objectives

Plan — Indicates flat field

M — Metallurgical designed for use with opaque specimens

NCG — (No cover glass) for use with uncovered specimens in transmitted light

P — Strain free, for polarizing use

Plan P — Flat field, strain free

L — Long working distance

W — Water immersion

PM — Strain free, metallurgical type

DLL — Phase — dark contrast, light background

DM — Phase — dark contrast, medium background

BM — Phase — bright contrast, medium background

DLL-F — Phase — dark contrast light — fluorescence

DM-F — Phase — dark contrast medium — fluorescence

U — Long-working-distance, strain-free;

may be used with 4-axis stage.

## Warranty and Service

Nikon Microscopes, attachments and accessories are warranted against defective material and workmanship under normal use and application for a period of 5 years from date of invoice to the original purchaser.

Service and repairs are accomplished by expert factory-trained technicians in our Garden City, Long Island offices. Repairs must be sent prepaid, and must be clearly marked "Nikon Instrument Group — Attn: Repair Dept."

Please include a note describing the malfunction. If possible, please furnish the date of purchase and the invoice number.

## Ordering Information

**This Scientific Microscope Catalog with accompanying Price List replaces and supersedes all previous Nikon Microscope Price Lists.**

**Detailed brochures are available on request for specific models.**

**The arrangement of this Catalog is designed to facilitate identification and ordering of equipment.**

Please use product numbers whenever possible to avoid errors.

A national network of competent factory trained representatives is ready to assist you in the proper selection, installation and use of the equipment.

ALL PRICES ARE SUGGESTED LIST PRICES, F.O.B. GARDEN CITY, N.Y.

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

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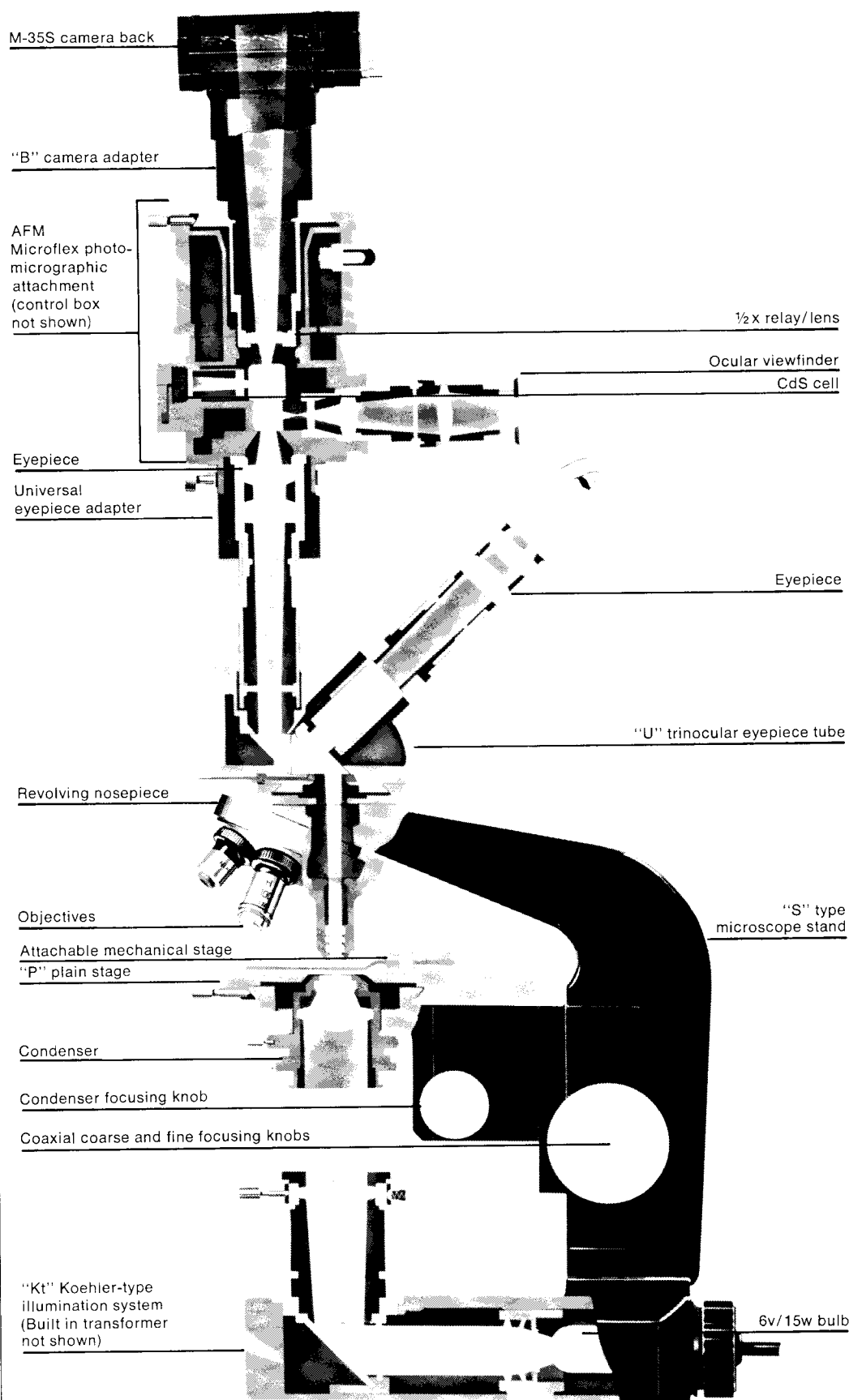
NIKON Microscopes offer bright-field, darkfield, phase contrast, interference phase, differential interference, and polarization, as well as fluorescence capabilities. Teaching head attachments, projection screen attachments, projection prisms, drawing tubes and a large variety of illuminators are also available. The wide choice of options allows configurations that are tailored to the user's specific requirements. Modularity is the basic design concept of NIKON Microscopes. The stands can be equipped with interchangeable body tubes, eyepieces, objectives, and a wide array of attachments and accessories.

NIKON's worldwide reputation as the leader in photographic equipment is reflected in the comprehensiveness of our fully modular photomicro / photomacrographic units and attachments. There are probably as many NIKON Microflex photomicrographic attachments in use today on microscopes of other manufacture as the combined total of those manufacturers' own photo units. No better testimonial can be found.

Today, the various NIKON models offer unsurpassed optical quality, innovative design combined with rugged reliability, and availability at very competitive prices.

The diagram to the right shows a representative model NIKON Microscope equipped as a photomicroscope with trinocular body tube and AFM Automatic Photomicrographic Attachment. When ordering a complete microscope, it should be noted that all of the basic components indicated should be included in order to have a functional instrument.

## Components of the Nikon Microscope Model S-Kt Compact



## Guide to Selection



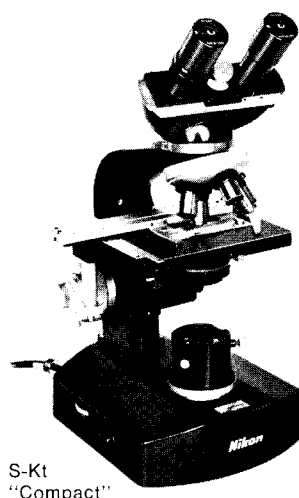
CL  
Classic

### CL Classic

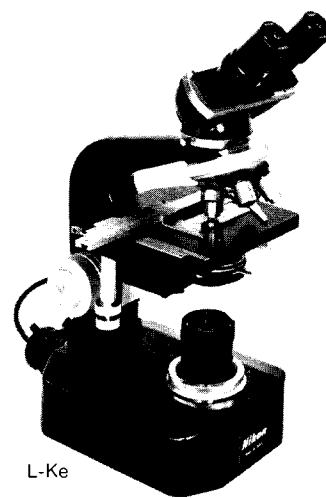
Designed primarily as an advanced school microscope, the Classic features "student proof" locked-in objectives, eyepieces, and condenser. However, its first quality optics and full-sized stand also qualify it as a budget priced laboratory microscope.



S-Cb



S-Kt  
"Compact"



L-Ke

## "S" Series

The excellent and versatile "S" type stand has a large, dust-proof ball-bearing nosepiece with internal parcentric stops, and coaxial coarse and fine focusing knobs. It also includes the extremely useful pre-set auto focus lever. The entire range of modular accessories that has made NIKON Microscopes justly famous for their amazing versatility can be used on the "S" series. These are the clinical and laboratory microscope stands of choice throughout the world.

### S-Cb

Its base has a built-in sub-stage illuminator with double collector lens system that insures bright, even illumination throughout the entire magnification range. The S-Cb illuminator is now available in 4 versions:

1. 6 volt/15 watt — offers the advantage of increased light output with less heat from the low voltage bulb. Has built-in transformer and continuously variable intensity control.
2. A new 6 volt model using a 20 watt quartz-halogen lamp is now available. It offers extra high light intensity.
3. 115 volt with dimmer — offers combined on/off switch and continuously variable solid-state dimmer. Uses half-silvered 115v/20w reflector bulb.
4. 115 volt line cord — this budget unit uses the 115v/20w reflector bulb, and on/off switch, but has no intensity control.

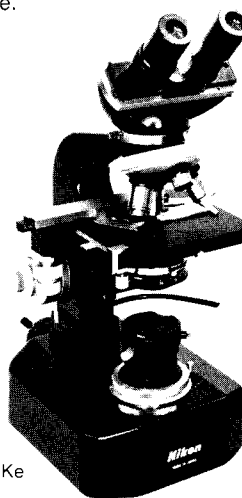
### S-Kt "Compact"

Features the "S" stand on a superlative Koehler-type illuminating base with a centerable field diaphragm for optimum glare-free illumination. Uses a

pre-centered 6v/15w flat-filament bulb; built-in transformer and voltage meter with continuously variable rheostat control. Detachable power cord. This is the finest of clinical and laboratory type microscopes.

### S-Ke

The "S" stand on our true Koehler research quality illumination base, with a powerful 6v/30w illuminator using a 6v/5a metered variable external transformer. A superb basic research microscope.

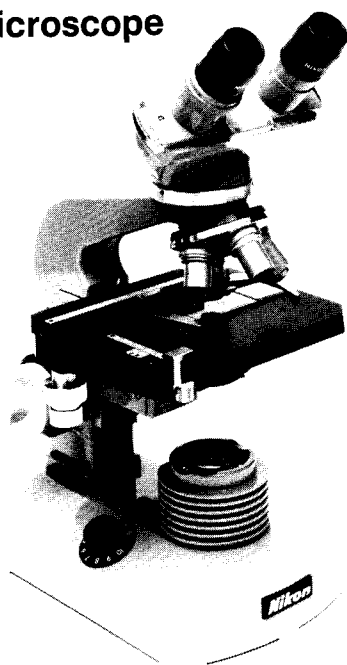


S-Ke

### L-Ke

An advanced research microscope. Uses the same Koehler illumination base and 6v/30w system as the S-Ke. However, the L-Ke stand has a longer range of focusing travel (for oversized specimens); centerable focusing condenser mount; a dovetailed 5-place removable nosepiece. This is especially recommended for brightfield/phase contrast microscopy; each set of objectives can remain mounted on its own nosepiece for rapid interchange. A 12v/100w Quartz-Halogen illumination source is available for models S-Ke and L-Ke, and is recommended when optimum illumination is required for photomicrography.

## CL "Classic" School Microscope



The Nikon CL "CLASSIC" Microscope has the following specifications:

- Binocular Body Tube with 45° inclination; locked-in; rotatable 360°.
- Wide Field High Eyepoint HW10x eyepieces; locked in.
- 4-place multi ball-bearing nose-piece.
- Achromat color-coded objectives, all locked-in and parfocal: 4x, 10x, 40x, retractable and 100x (oil) retractable.
- Rectangular stage plate, 130x 135mm surface, with locked-on detachable low-position coaxial mechanical stage movement: 26x 76mm.
- Centerable Abbe 2 lens condenser with iris diaphragm, n.a. 1.25, on rack and pinion focusing, locked-in.
- Co-axial coarse and fine focusing with knobs on both sides of stand.
- Stable base 6¾" x 9"; will fit into standard size storage cabinets.
- Built-in substage illuminator 115v/30w with double-lens collector system.
- Build-in solid state dimmer, continuously variable, with on/off switch.
- Built-in 3 wire UL/CAS approved power cord.
- Plastic dust cover.
- Immersion oiler.
- Replacement 110v/20w half-silvered bulb.

77400	CL "CLASSIC" Binocular Microscope, as above, with mechanical stage
77401	CL "CLASSIC" Binocular Microscope, with plain stage
77402	CL "CLASSIC" Monocular Microscope, as above but with locked-in 45° inclined monocular body tube, rotatable 360°; locked-in wide-field high eyepoint HW10x eyepiece, mechanical stage
77403	CL "CLASSIC" Monocular Microscope, with plain stage
77410	Carrying case
77427	110v/20w Half silvered reflector bulb, bayonet base (replacement)
76910	Daylight, clear light blue filter, 33mm
76960	Eyepiece pointer
76970	Swing-out filter holder (optional)
77413	Tool for removing objectives and eyepieces

*NOTE: the CL "CLASSIC" is a unique new addition to the array of Nikon Microscopes. It is a departure from the basic Nikon modular design concept, because the CL is furnished as a complete unit.*

For Phase Contrast accessories, see listings on page 26. For Dark Field, see Condenser listings, page 21 and Objective listings, page 22.

## S-Cb Microscope



### S-Cb Microscope Series

The S-Cb is one of the dependable Nikon "S" series of laboratory microscopes.

The S-Cb in-base substage illuminator has a double collector lens system that insures bright, even illumination throughout the entire magnification range. The S-Cb is available in 5 models, allowing selection from 4 different illuminators to match performance requirements with the budget, as well as one model without any illumination system, for use with Episcopic or external illuminators. All have the 4-place Nikon ballbearing nosepiece.

#### 77526 S-Cb/D115 Stand

Offers a combined on/off switch and continuously variable solid-state dimmer. Supplied with two 115v/20w reflector bulbs, #77427.

#### 77558 S-Cb/115 Stand

This budget unit uses the 115v/20w reflector bulb and on/off switch. Has line cord, but no intensity control. Supplied with two #77427 bulbs.

#### 77513 S-Cb/D6 Stand

6 volt/20 watt: offers the advantage of increased light output from the low voltage bulb. Has built-in transformer and continuously variable intensity control. Supplied with two 6v/18w bulbs, #77907.

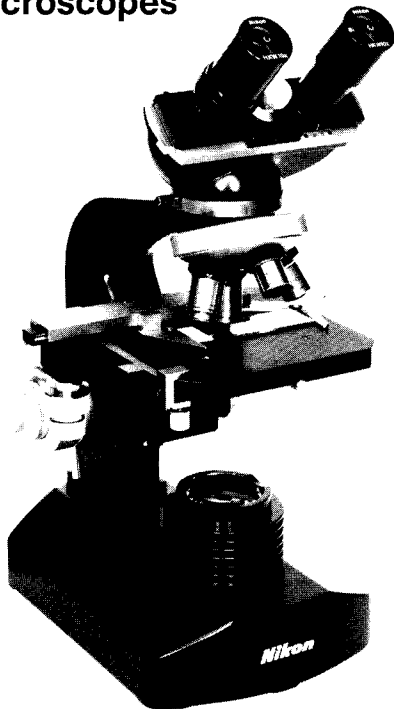
#### 77540 S-Cb/D6QH Stand

6 volt/20 watt quartz halogen: offers the advantage of even greater light intensity than the 6 volt tungsten model. Especially recommended for phase contrast microscopy. Has a built-in transformer and continuously variable solid-state intensity control. Supplied with one quartz-halogen 6v/20w bulb, #77528.

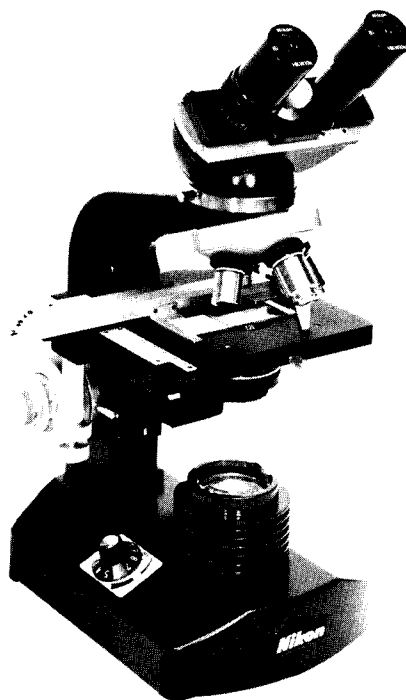
#### 77538 S-Cb/E Stand

This fifth version of the S-Cb has had all of the in-base optical and electrical illuminator components removed. The stand is designed for special applications such as the Epi illuminator for on-axis illumination for reflected light microscopy.

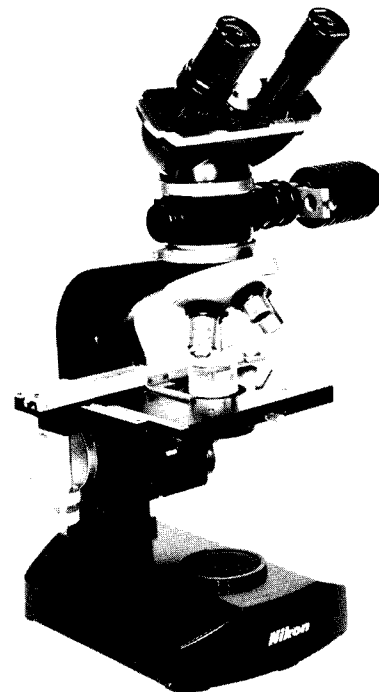
## S-Cb Microscopes



SBP-Cb/115  
with Ge mechanical stage



SBR-Cb/D6QH  
with Phase Contrast



SBR-Cb/E with  
EPI illuminator

## Accessories For S-Cb

77529	Wooden case for Model S-Cb
77773	Ge attachable low-position coaxial mechanical stage, right hand model (Requires P stage)
77774	Ge stage, as above, left hand model (Requires P stage)
<b>NOTE:</b>	<b>77773 and 77774 are for use with "P" stage models</b>
77427	15v/20w reflector bayonet base bulb (replacement) for S-Cb/D115, S-Cb/115 and Classic
77907	6v/3a bayonet base bulb (replacement) for S-Cb/D6
77528	6v/20w quartz-halogen bulb (replacement) for S-Cb/D6 QH
77530	Quartz-halogen conversion adapter plug (to convert #77513 stand into S-Cb/D6 QH)
<b>NOTE:</b>	<b>For complete S-Cb Microscope assemblies, see page 6.</b>

**NOTE:** For complete listings of optics, see pages 21-26.  
For complete listings of photomicrographic accessories, see pages 28-32.

## For S-Cb Brightfield Configurations, see page 6 S-Cb Suggested Configuration for Phase Contrast Microscopy

<b>NOTE:</b>	Due to light level requirements with phase contrast, the low voltage 6 volt S-Cb 20 watt quartz-halogen is recommended
77540	S-Cb/D6 QH 6 volt 20 watt quartz-halogen stand with 4-place nosepiece
77750	Binocular body tube
77858	HKW-10x eyepieces, paired
77765	"R" rectangular mechanical stage
77040	Phase turret condenser with centering telescope, green and heat absorbing filters
77020	DLL-10x phase contrast objective
77022	DLL-120x phase contrast objective
77025	DLL-40x phase contrast objective
77027	DLL-100x (oil) phase contrast objective
77900	Vinyl dust cover
76997	Lens paper
77528	Spare 6v/20w quartz-halogen bulb

## S-Cb Suggested Configuration for Reflected Light Microscopy

77538	S-Cb/E stand less illuminator with 4-place nosepiece
77750	Binocular body tube
77858	HKW-10x eyepieces, paired
77765	"R" rectangular mechanical stage
76994	Epi illuminator with 6v/20w transformer
77832	M5x achromat objective
77833	M10x achromat objective
77834	M20x achromat objective
77837	M40x achromat objective
76972	Vinyl dust cover
76997	Lens paper

NOTE: The most often used configuration is the SBR-Cb with binocular head and "R" rectangular mechanical stage. These are marked with an asterisk (\*).

## S-Cb MICROSCOPE Series

### COMPLETE ASSEMBLY BREAKDOWNS

9

NOTE: The most often used configuration is the SBR-Cb with binocular head and "R" rectangular mechanical stage. These are marked with an asterisk (\*).

S-Cb MICROSCOPE Series

COMPLETE ASSEMBLY BREAKDOWNS

COMPONENT	S-Cb STANDS				BODY TUBES		STAGES		EYEPICES		ACHROMAT OBJECTIVES			PLAN ACHROMAT OBJECTIVES			CONDENSERS		ACCESSORIES						
	S-Cb/D115 (77526)	S-Cb/115 (77558)	S-Cb/D6 (77513)	S-Cb/D6 OH (77540)	Inclined Mono. Tube (77740)	Binocular Tube (77750)	R Stage (77765)	P Stage (77775)	Paired Eyepieces HKW-10x (77858)	HKW-10x Eyepiece (77857)	4x Achromat Obj. (77790)	10x Achromat Obj. (77795)	40x Achromat Obj. (77810)	± 100x Achromat Obj. (77820)	4x Plan Achromat Obj. (77794)	10x Plan Achromat Obj. (77796)	40x Plan Achromat Obj. (77806)	± 100x Plan Achromat Obj. (77821)	Abbe N Condenser (77890)	Filter, Clear Blue (76914)	Filter, Clear Blue (76910) ("CL")	Vinyl Dust Cover (77900)	Lens Paper (76997)	Spare 6v Bulb (77907)	Spare 115v Bulb (77427)
S-Cb/D115 (Dimmer 115v) COMPLETE ASSEMBLIES																									
SIPCb/D115 Monocular, P Stage																									
SIRCb/D115 Monocular, R Stage																									
SBPCb/D115 Binocular, P Stage																									
*SBRCb/D115 Binocular, R Stage																									
SBPCb/D115 Flatfield Binocular, P Stage																									
SBRCb/D115 Flatfield Binocular, R Stage																									
77705																									
77706																									
77707																									
77708																									
77709																									
77711																									
S-Cb/115 (No Dimmer 115v/20w) COMPLETE ASSEMBLIES																									
SIPCb/115 Monocular, P Stage																									
SIRCb/115 Monocular, R Stage																									
SBPCb/115 Binocular, P Stage																									
*SBR/Cb/115 Binocular, R Stage																									
77712																									
77713																									
77714																									
77715																									
S-Cb/D6 (Dimmer 6v/18w) COMPLETE ASSEMBLIES																									
SIPCb/D6 Monocular, P Stage																									
SIRCb/D6 Monocular, R Stage																									
SBPCb/D6 Binocular, P Stage																									
*SBRCb/D6 Binocular, R Stage																									
SBPCb/D6 Flatfield Binocular, P Stage																									
SBRCb/D6 Flatfield Binocular, R Stage																									
77718																									
77719																									
77720																									
77721																									
77722																									
77723																									
S-Cb/D6 (Quartz-Halogen 6v/20w Dimmer) COMPLETE ASSEMBLIES																									
SIPCb/D6 Q.H. Monocular, P Stage																									
SIRCb/D6 Q.H. Monocular, R Stage																									
SBPCb/D6 Q.H. Binocular, P Stage																									
*SBRCb/D6 Q.H. Binocular, R Stage																									
SBPCb/D6 Q.H. Flatfield Binocular, P Stage																									
SBRCb/D6 Q.H. Flatfield Binocular, R Stage																									
77541																									
77542																									
77543																									
77544																									
77545																									
77546																									

\*All 100x objectives are furnished with immersion oil.

NOTE: For use with "P" stage models, the Ge stage is recommended.

77773 Ge attachable low-position coaxial mechanical stage, **right hand model**.

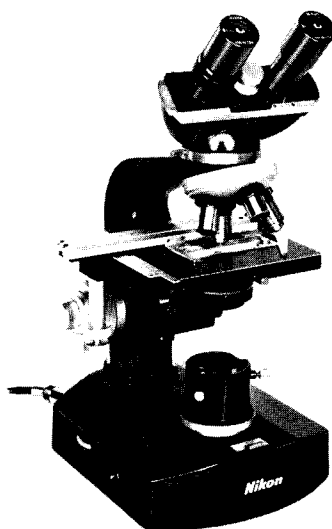
77774 Ge attachable low-position coaxial mechanical stage, **left hand model**.



## S-Kt Compact

The S-Kt "Compact" microscope incorporates a new design feature: the "S" type stand is mounted on the "Kt" base that contains a built-in transformer. The 6v/15w Koehler-type illuminating system uses a flat filament precentered bulb, which eliminates the need for lamp centration. A centerable iris-type field diaphragm and built-in voltmeter are also located in the Kt base. The electrical cord is detachable.

The S-Kt is the finest Nikon clinical type of instrument. It accepts virtually all of the "S" modular accessories and attachments, thereby lending itself to many varied configurations.



SBR-KT with Koehler-type illuminating system.

### S-Kt Microscope Stands

- 77517 S-Kt "COMPACT" Stand only with 4-place nose-piece and built-in transformer with 2 bulbs (77903)  
77524 S-Kt "COMPACT" Stand with 5-place nosepiece

### Accessories for S-Kt

- 77903 6v/15w Precentered Bulb for Kt illuminator (replacement)  
77523 Carrying case  
77773 Ge attachable low-position coaxial mechanical stage, right hand model. (Requires P stage)  
77774 Ge stage, as above, left hand model. (Requires P stage)

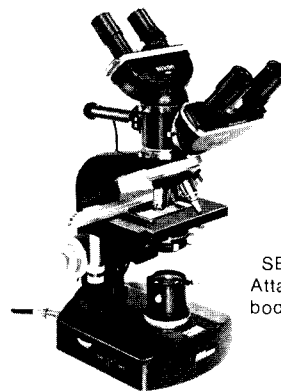
NOTE: 77773 and 77774 are recommended for use with "P" stage models listed below

### S-Kt "Compact" Assemblies (See Chart Below)

- 77531 SBP-Kt (Binocular with P stage)  
77532 SBR-Kt (Binocular with R stage)  
77535 SUR-Kt (Trinocular with R stage)  
77533 SBP-Kt FLAT FIELD (Binocular with P stage)  
77534 SBR-Kt FLAT FIELD (Binocular with R stage)  
77536 SUR-Kt FLAT FIELD (Trinocular with R stage, Achromat condenser)

### S-Kt Suggested Configuration for Dual Teaching Microscope Binocular

- 77517 S-Kt "Compact" stand  
77150 Teaching head attachment with transformer  
77750 "B" binocular body tube (2 required)  
77858 HKW-10x eyepieces, paired (2 pair required)  
77765 "R" rectangular mechanical stage  
77790 4x achromat objective  
77795 10x achromat objective  
77810 40x achromat objective  
77820 100x (oil) achromat objective  
77890 Abbe N condenser  
76970 Swing-out filter holder  
76914 Clear blue filter, 33mm  
76972 Vinyl dust cover (Ke type)



SBR-KT with Teaching Head Attachment and dual binocular body tubes.

### S-Kt Suggested Configuration for Phase Contrast Microscopy

- 77517 S-Kt "Compact" stand  
77750 "B" binocular body tube  
77858 HKW-10x eyepieces, paired  
77765 "R" rectangular mechanical stage  
77040 Phase turret condenser with centering telescope, green and heat absorbing filters  
77020 DLL-10x phase contrast objective  
77022 DLL-20x phase contrast objective  
77025 DLL-40x phase contrast objective  
77027 DLL-100x (oil) phase contrast objective  
76970 Swing-out filter holder  
77900 Vinyl dust cover

NOTE: For complete listings of optics, see pages 21-26.  
For complete listings of photomicrographic accessories, see pages 28-32.

### S-Kt Complete Assembly Breakdowns

	S-Kt Compact Stand (77517)	Binocular Head (77750)	U Trinocular (77759)	R Stage (77765)	P Stage (77773)	Paired Eyepieces HKW-10x (77858)	4x Achromat Obj. (77790)	10x Achromat Obj. (77795)	40x Achromat Obj. (77810)	100x Achromat Obj. (77820)	4x Plan Achromat Obj. (77794)	10x Plan Achrom. Obj. (77796)	40x Plan Achrom. Obj. (77806)	100x Plan Achrom. Obj. (77821)	Abbe N Condenser (77890)	Achromat Condenser (77894)	Filter, Clear Blue (76914)	Vinyl Dust Cover (77900)	Swing out Filter Holder (76970)	Lens Paper (76997)	HKW-10x Photo Eyepiece (77857)
SBP-Kt #77531	•	•			•	•	•	•	•	•					•		•	•	•	•	
SBR-Kt #77532	•	•		•		•	•	•	•	•					•		•	•	•	•	
SUR-Kt #77535			•	•		•	•	•	•	•					•		•	•	•	•	•
SBP-Kt FLAT FIELD #77533	•	•			•	•					•	•	•	•	•		•	•	•	•	
SBR-Kt FLAT FIELD #77534	•	•		•		•					•	•	•	•	•		•	•	•	•	
SUR-Kt FLAT FIELD #77536	•		•	•		•					•		•	•	•	•	•	•	•	•	•

## S-Ke Microscope

The S-Ke microscope stand is comprised of the "S" type body and the heavy "Ke" base that houses a complete Koehler illuminating and optical system. Koehler illumination makes the most efficient use of available light, as only the area under inspection is illuminated. Glare, flare and halo effects are reduced to a minimum. A built-in base turret with auxiliary condenser lenses to adjust the illumination for low, medium and high power objectives is one of the features that makes the S-Ke an ideal microscope for both visual and photomicrographic applications.

The 6v/30w tungsten illuminating system, with the 76708 metered transformer is standard and ordinarily furnished with the S-Ke stand. However, where higher light levels are desired, the 12v/100w quartz-halogen illuminator and power supply should be used; the S-Ke body is available without the 6v/30w tungsten system for such installations.



SBP-KE with "Ge" attachable mechanical stage and 6v/30w transformer.

SUR-KE Photomicroscope with flat field objectives and Nikkormat FTn camera on EFM semi-automatic Microflex attachment.

### S-Ke Basic Microscope Stands

76720	S-Ke Stand with 4 place nosepiece (Standard) and #76708 6v/30w Transformer; tungsten illuminator; 2 bulbs #77904
<u>76721</u>	S-Ke Stand with 5 place nosepiece (Optional) and #76708 6v/30w Transformer; tungsten illuminator; 2 bulbs #77904
76974	Carrying case
76705	S-Ke Stand with 4-place nosepiece, 12v/100w quartz-halogen illuminator, power supply and 76513 bulb.
76712	S-Ke Stand with 5-place nosepiece, 12v/100w quartz-halogen illuminator, power supply and 76513 bulb.

### S-Ke Microscopes — Complete Assemblies (See Chart)

76690	Model SBP-KE (Binocular, P stage)
76691	Model SBR-KE (Binocular, R stage)
76693	Model SUR-KE (Trinocular, R stage)
76695	SUR-KE Photomicroscope, (Trinocular, R stage, flat field objectives, achromat condenser)

**NOTE:** For complete listings of optics, see pages 21-26.  
For complete listings of photomicrographic accessories, see pages 28-32.

### S-Ke Suggested Configuration for Phase Contrast Microscopy

76720	S-Ke body, 4-place, with 6v/30w transformer
77750	"B" binocular body tube
77858	HKW-10x eyepieces, paired
77765	"R" rectangular mechanical stage
77040	Phase turret condenser with centering telescope, green and heat absorbing filters
77020	DLL-10x phase contrast objective
77022	DLL-20x phase contrast objective
77025	DLL-40x phase contrast objective
77027	DLL-100x (oil) phase contrast objective
76970	Swing-out filter holder
76972	Vinyl dust cover

### S-Ke Suggested Configuration for Cytological Examination

76721	S-Ke body, 5-place, with 6v/30w transformer
77750	"B" binocular body tube
77858	HKW-10x eyepieces, paired
77765	"R" rectangular mechanical stage
77892	Abbe condenser with oblique slider
77794	4x plan achromat objective
77796	10x plan achromat objective
77797	20x plan achromat objective
77841	40x plan fluorite objective
77807	40x NCG plan achromat objective (for use with smears without coverslips)
76970	Swing-out filter holder
76914	Daylight blue filter, 33mm
76972	Vinyl dust cover

### S-Ke Complete Assembly Breakdowns

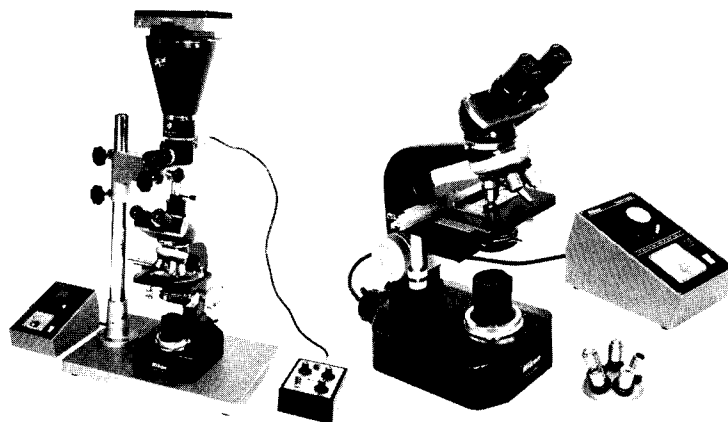
	S-Ke Stand 6v/30w Trans. (76720) w/illum.	Binocular Head (77750)	U Trinocular Head (77759)	P Stage (77775) w/ GE Attachable (77773)	R Stage (77765)	Paired HKW-10x Eyepieces (77858)	Abbe Cond. w/slider (77892)	Achromat Condenser (77894)	4x Achromat Obj. (77790)	10x Achromat Obj. (77795)	40x Achromat Obj. (77810) ▲	100x Achromat Obj. (77820) ▲	4x Plan Achromat Obj. (77794)	10x Plan Achromat Obj. (77796)	40x Plan Achromat Obj. (77806) ▲	100x Plan Achromat Obj. (77821) ▲	Swing Out Filter Holder (76970)	Vinyl Dust Cover (76972)	Clear Blue Filter (76914) 33mm.	Lens Paper (76997)	Mirror and Fork Assy. (76966)	HKW-10x Photo Eyepiece (77857)
<b>SBP-KE #76690</b>	●	●		●		●	●		●	●	●	●					●	●	●	●		
<b>SBR-KE #76691</b>	●	●			●	●	●		●	●	●	●					●	●	●	●		
<b>SUR-KE #76693</b>	●		●		●	●			●	●	●	●					●	●	●	●		●
<b>SUR-KE (Photo) #76695</b>	●		●		●	●		●					●	●	●	●	●	●	●	●		●

▲ Retractable objective

# L-Ke Microscope

The model L-Ke is a most versatile research grade microscope. True Koehler illumination is an important feature that ensures the most even, brightest illumination without flare. The L-Ke is an ideal instrument for both visual observation and photomicrography. The 6v/30w tungsten illuminator with metered transformer is standard, but a high light level 12v/100w quartz-halogen system is also available. This quartz halogen illuminator extends the capabilities of the L-Ke for use with the FITC fluorescence microscopy technique, while also furnishing an ideal light source for brightfield, darkfield, and phase contrast microscopy and photomicrography. The interchangeable

able dovetailed nosepieces for the L-Ke allow the user to take full advantages of these opportunities, as one nosepiece could be mounted with brightfield objectives, while another could hold phase contrast and/or phase fluorescence optics. The entire range of Nikon modular accessories and attachments can be mounted on the L-Ke stand. This versatility, combined with its precise focusing system that includes an oversized range of travel, and its centerable condenser mount, result in a microscope that is the ideal instrument for the pathologist, cytotechnologist, and research microscopist.



LFR-KE Photoscope with flat field objectives and Polaroid M-100 film pack adapter on one, with AFM Auto-Microflex attachment, mounted on cine/photo stand.

LBR-KE with additional interchangeable quintuple nosepiece on dovetail slider; 12v/100w quartz-halogen illuminator.

## L-Ke Basic Microscope Stand

- 76752 L-Ke body with 5 place nosepiece and #76708 6v/30w transformer illuminator, 2 bulbs #77904
- 76751 5 place nosepiece on dovetail (Spare)
- 76974 Carrying case
- 76753 L-KE body with 5 place nosepiece, 12v/100w quartz halogen illuminator, power supply, 76513 bulb.

## L-Ke Microscopes — Complete Brightfield Assemblies (See Chart)

- 76780 Model LBP-KE (Binocular, P stage)
- 76782 Model LBR-KE (Binocular, R stage)
- 76786 Model LUR-KE (Trinocular, R stage)
- 76790 LUR-KE Photomicroscope, (Trinocular, R stage, flat field objectives, achromat condenser)

## Model L-Ke Suggested Configuration for Brightfield, with Options for Phase Contrast, FITC Fluorescence Microscopy, and Optional Photomicrographic Capability:

- 76753 L-Ke body only with 5-place nosepiece, 12v/100w quartz-halogen illuminator with metered power supply and 1 bulb
- 77759 "U" trinocular body tube
- 77858 HKW-10x eyepieces, paired
- 77894 Achromat condenser with slider, n.a. 1.25
- 77794 4x plan achromat objective
- 77796 10x plan achromat objective
- 77797 20x plan achromat objective
- 77806 40x plan achromat objective
- 77821 100x (oil) plan achromat objective
- 76914 Clear blue filter, 33mm
- 76970 Swing-out filter holder
- 76966 Mirror and fork assembly

(Options continued in right column)

## Continued: Options for Phase Contrast, FITC Fluorescence Microscopy, and Optional Photomicrographic Capability

### Phase Contrast Option

- 76151 5-place nosepiece (extra) on dovetail slider
- 77040 Phase turret condenser with centering telescope, green and heat absorbing filters
- 77020 DLL-10x phase contrast objective
- 77022 DLL-20x phase contrast objective
- 77025 DLL-40x phase contrast objective
- 77027 DLL-100x (oil) phase contrast objective

### FITC Fluorescence Option

- 77825 100x (oil) achromat objective with iris diaphragm
- 77896 Ultra darkfield condenser
- 78516 FITC multicoated exciter filter, 45mm
- 78517 FITC barrier filter,  $\approx$ 12 deep yellow, 28mm

### Photomicrographic Option

- 77857 HKW-10x eyepiece (for trinocular photo tube)
- 77060 AFM Automatic Microflex attachment complete
- 77137 M-35S camera back, 35mm
- 77090 Camera cone with 1.3x relay lens for large format and Polaroid photography
- 77080 Grafflok back, 4"x5" (accepts both Polaroid #545 film holder for 4x5 and #405 film pack 3 1/4 x 4 1/4 holder, as well as 4x5 sheet film carriers) (for use with 77090)
- 77076 Polaroid #405 film pack holder (for use with 77090)
- 76551 Photo stand, type 3
- 77332 Vinyl dust cover (to fit over photo stand assembly)

For complete listings of objectives, eyepieces and condensers that may be used with this model, see pages 22, 23 and 26.

## L-Ke Complete Assembly Breakdowns

	L-Ke Body 6v/30w Trans. (76752) w/illum.	Binocular Head (77750)	U Trinocular Head (77759)	P Stage (77775) w/ GE Attachable Stage Motion (77773)	R Stage (77785)	Paired HKW-10x Eyepieces (77858)	Abbe Cond. w/slider (77892)	Achromat Condenser (77894)	4x Achromat Obj. (77790)	10x Achromat Obj. (77795)	40x Achromat Obj. (77810) ▲	100x Achromat Obj. (77820) ▲	4x Plan Achromat Obj. (77794)	10x Plan Achromat Obj. (77796)	40x Plan Achromat Obj. (77806) ▲	100x Plan Achromat Obj. (77821) ▲	Swing Out Filter Holder (76970)	Vinyl Dust Cover (76972)	Clear Blue Filter (76914) 33mm.	Lens Paper (76997)	Mirror and Fork Assy. (76966)	HKW-10x Photo Eyepiece (77857)
<b>LBP-KE #76780</b>	●	●		●		●	●		●	●	●	●					●	●	●	●	●	
<b>LBR-KE #76782</b>	●	●			●	●	●		●	●	●	●					●	●	●	●	●	
<b>LUR-KE #76786</b>	●		●		●	●	●		●	●	●	●					●	●	●	●	●	●
<b>LUR-KE (Photo) #76790</b>	●		●		●	●		●					●	●	●	●	●	●	●	●	●	●

▲ Retractable objective

# Apophot Universal Research Microscope

The APOPHOT Universal Research Microscope features a "vertical optical bench" design. Its large stand easily accepts a variety of attachments and accessories while retaining utmost rigidity as a rock-steady foundation for its entire system. The stand is furnished with a trinocular head containing 30° inclined observation binocular and vertical photo tube with automatic compensation for interpupillary distance adjustment. A lever controls the three-way prism for:

1. 30% visual, 70% photo
2. 100% visual
3. 100% photo

A unique zoom Koehler system is built into the APOPHOT body. By merely turning a calibrated knob, the user can match the illumination precisely to the numerical aperture of the objective. Two separate light sources can be mounted, to be used individually or simultaneously; both are controlled by a simple push-pull selector rod. This allows for combinations of 6v/30w tungsten; 12v/100w quartz-halogen; 150w Xenon-arc; HBO-200 mercury vapor as well as 200-watt second electronic flash. An episcopic illuminator is also available for on-axis reflected light illumination, which also may be used simultaneously with transmitted light illumination. Quadruple and quintuple remov-

able nosepieces on dovetail sliders allow easy interchange of objectives; especially desirable when both brightfield and phase contrast microscopy are required. A variety of stages is available for the APOPHOT: all are mounted on a dovetail mount for greater rigidity. Condensers are held in centerable mount by dovetail sliders for rapid interchange while retaining precision alignment.

The APOPHOT is normally equipped with a magnification changer, with factors of 1X, 1.25X and 1.5X. This component also contains a built-in phase centering telescope. The HKW-8x eyepieces are most popular for use with the APOPHOT. The APOPHOT offers Polarizing and Fluorescence attachments to meet your research requirements.

rescence attachments to meet your research requirements.

The massive APOPHOT stand makes it an ideal instrument on which to mount a full complement of photomicrographic accessories. A socket on top of the microscope arm accepts a special version of the MULTIPHOT "H" rail. This rail holds brackets for attaching to either the Polaroid Microflex cone or to mount a cine camera. It will also accept the entire MULTIPHOT 4" x 5" camera assembly, for unique photographic versatility.

NOTE: Often, inferior photographs are traceable to the influence of environmental vibrations. In such cases, please inquire about the EPOI Vibration Isolation Systems.

- 76450 Apophot Universal Stand consisting of: main body with coaxial coarse and fine stage focusing controls graduated to .001mm; dual illumination ports with mirror adjustment for selection of either or both illuminators in combination; built-in zoom Koehler collector system for transmitted light with knob selector for numerical apertures; 3-way trinocular tube with tube length compensation; nosepiece adapter; rack and pinion condenser focusing mount with centerable dovetail condenser holder and socket with clamp to accept vertical bar for mounting accessory equipment
- 76452 Rotary magnification changer with 4-position turret containing 1.0x, 1.25x, 1.5x lenses and phase centering Bertrand Lens
- 76505 Quadruple revolving nosepiece on dovetail slider
- 76510 Quintuple revolving nosepiece on dovetail slider
- 76462 Swing-out filter holder

## Stages

- 76460 Rectangular mechanical stage, graduated, rotatable, with right and left hand coaxial controls 75mm x 50mm, oval cutout
- 76466 Square mechanical stage, graduated, rotatable, with right and left hand coaxial controls, 75mm x 50mm travel, round cutout
- 76468 CgC Centerable, graduated, circular, rotatable stage; 140mm diameter
- 76478 CgC Centerable, graduated, circular rotatable stage with built-in X and Y graduated mechanical motion
- 76480 Circular, graduated ball bearing stage with 45° click stops

## Illuminators

- 76454 Lamp housing, centerable, for 6v/30w flat filament bulb (Cat. No. 77904)
- 76708 6v/30w Transformer with voltmeter (for above)
- 76459 Quartz-Halogen Light Source, 12v/100w, with adapter collar and continuously variable power supply, with one bulb (76513)
- 76457 Xenon-arc Light Source, 150w, with power supply
- 78574 200w Mercury (see Apophot Fluorescence listings)
- 76455 EPI illuminator (requires light source)
- 79882 Electronic Flash: includes Illuminator housing with flash tube, power pack and cord. Maximum output — 200 watt/secs. (for S-Ke, L-Ke & Apophot)

## Optics

See pages 21, 22, 23 & 26 for selection.

- 77881 HKW 8x, 1 each } recommended if #76452 magnification changer is used
- 77882 HKW 8x, paired }

## Accessories

- 76463 Dovetail condenser holder (extra)
- 76473 Adapter to mount 76965 Projection Head
- 76484 Adjustable Microflex adapter for use with HK5x, HKW10x, HKW15x eyepieces (replacement)
- 76485 Microflex adapter for use with HKW8x eyepiece (replacement)
- 76470 Support rail for Microflex cone, or Multiphot assembly
- 76471 Cine bracket for support rail
- 76472 Microflex cone bracket for support rail

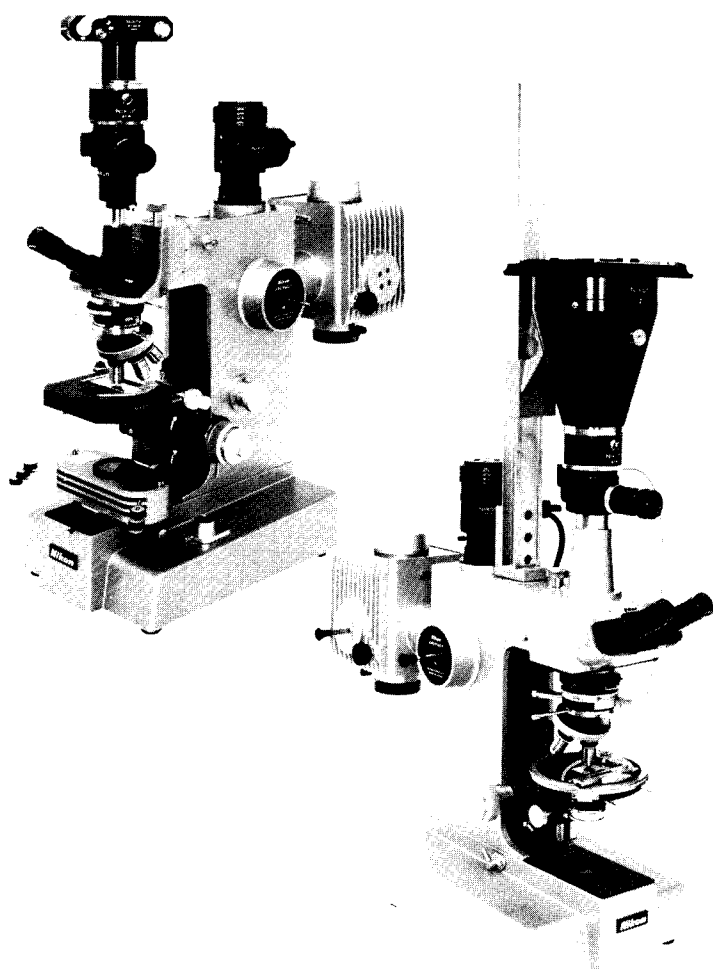
## Polarizing Accessories

- 76480 Circular, graduated ball bearing stage with 45° click stops
- 77237 Low-profile attachable mechanical stage (for above)
- 76483 Condenser with polarizer, flip-out top element
- 76479 Intermediate microscope tube containing: depolarizer, Bertrand lens, magnifier for reading Babinet compensator, ¼ wave length and sensitive tint plates, Senarmont compensator
- 76481 Quadruple revolving nosepiece with individually centerable objective receptacles, on Apophot dovetail slider (cannot be used with Babinet compensator)
- 76482 Single objective adapter (for use with Babinet compensator)
- 77216 Single objective holder
- 77217 Set of 4 single objective holders #77216
- 77224 Babinet compensator
- 76477 Polarizing filter set of polarizer and analyzer (for simple polarized light work only)

NOTE: For additional polarizing accessories, see pages 14 & 15.

## Fluorescence Accessories

- 78576 Fluorescence illuminator lamphousing
- 78574 { 78577 Lamp socket (requires power supply)
- 78578 Power supply with starter (for 78577)
- 78580 200 watt super high-pressure mercury burner for Apophot fluorescence
- 78579 Filter bridge with 3 exciter filters (2 B.V., 1 U.V.); 2 green filters and 1 neutral density filter; field diaphragm extension lever
- 76451 Body tube holder for (A) or (I) body tubes
- 77747 Inclined monocular (A) eyepiece tube with vertical photo tube (for 76451)
- 77740 Inclined monocular (I) eyepiece tube (for 76451)
- 78575 Intermediate microscope tube with filter turret and slider; 6 barrier filters
- 78583 Comparison photometer consisting of: meter with sensor on coil cord; special eyepiece; check plate



### **Apophot Suggested Configuration as a Research Polarizing Microscope with Polaroid Photomicrographic Capability and Xenon/Quartz Halogen Illumination**

76450	Basic body with trinocular body tube, vinyl dust cover
77212	DHKW-10x eyepiece with cross line reticle
77857	HKW-10x eyepiece
76480	CgC Polarizing stage
77237	Low profile attachable mechanical stage
76483	Swing-out condenser with polarizer
76479	Intermediate piece with depolarizer, Senarmont compensator, sensitive tint and 1/4 wave plates
76481	Quadruple revolving nosepiece with individually centerable objective receptacles
76840	Plan P4x strain-free objective
76842	Plan P10x strain-free objective
76844	Plan P40x strain-free objective
76846	Plan P100x (oil) strain-free objective
76459	12v/100w Quartz-Halogen light source with power supply
76513	Spare bulbs for above (2 each)
76457	150w Xenon-arc light source with power supply
76470	Support rail for Microflex
76472	Cone bracket for support rail
77060	AFM Auto-Microflex photo attachment
77857	HKW-10x eyepiece for photo tube
77090	Cone with 1.3x relay lens
77080	Graflok 4"x5" camera back
77076	#405 Polaroid 3 1/4"x4 1/4" Film Pack back
76937	45mm Dark green filter, 2mm thick
76941	45mm Daylight blue filter
76462	Swing-Out filter holder

### **Suggested Apophot Configuration for Bright Field Transmitted Light Microscopy with 35mm & Polaroid Photomicrographic Capability**

76450	Basic body with trinocular body tube, vinyl dust cover
76452	Magnification changer
76460	Rectangular stage
76454	Centerable Tungsten, 6v/30w lamp housing
76708	6v/30w transformer (for above)
76459	Quartz-Halogen Light Source, 12v/100w, with power supply
76510	Quintuple nosepiece
76462	Filter holder
77882	HKW 8x eyepiece, pair
77794	4x Plan Achromat objective
77796	10x Plan Achromat objective
77797	20x Plan Achromat objective
77841	40x Plan Fluorite objective
77850	100x (oil) Plan Apochromat objective
77888	Achromat/Aplanat condenser, n.a. 1.40
77881	HKW-8x eyepiece — for trinocular tube
77060	AFM-B Auto Microflex photo attachment
76470	Support rail for camera cone
76472	Microflex cone bracket for rail
77090	Camera cone with 1.3x relay lens
77086	Polaroid M-100 Camera Back
77128	M-35A Motorized 35mm Camera Back
76943	80B Conversion Filter, 45mm
76936	82B Conversion Filter, 45mm
76948	Didymium Filter, 45mm
76945	Wrattan No. 58 Green Filter, 45mm
77904	6v/30w replacement bulb (3 each)
76513	Quartz Iodine replacement bulb (2 each)

### **Apophot Suggested Configuration as a Combination Fluorescence and Brightfield Research Microscope with 35mm Photomicrographic Capability**

76450	Basic body with trinocular body tube, vinyl dust cover
76451	Body tube holder for (A) or (I) body tubes
77747	Inclined monocular body tube with photo tube (A)
77858	HKW-10X eyepieces, paired (for 77747 body tube)
76460	Rectangular mechanical stage
77896	Ultra darkfield condenser
77888	Achromat/Aplanat condenser
76463	Dovetail condenser holder (spare) for above
76459	12v/100w Quartz-Halogen light source with power supply and bulb
76513	Spare bulbs for above (2 each)
76510	Quintuple revolving nosepiece on dovetail slider
77796	10X Plan Achromat objective
77797	20X Plan Achromat objective
77841	40X Plan Fluorite objective
77842	70X Fluorite objective
77843	Darkfield funnel stop for 77842
77825	100X (oil) Achromat with iris diaphragm
78576	Fluorescence illuminator lamphousing
78577	Fluorescence illuminator mercury socket assembly
78580	200 Watt mercury burner
78578	Power supply and starter (for 78576)
78579	Filter bridge with exciter filters
78575	"FL" Intermediate tube with barrier filters
76941	45mm Daylight blue filter
77060	AFM-B Auto-Microflex photo attachment
77137	M-355 35mm Camera Back

## Model MS Inverted Microscope

The model MS is an extremely versatile inverted microscope. Two basic versions are available: the round floating stage type with a "joystick" control and the square stage with low-position coaxial mechanical motion.

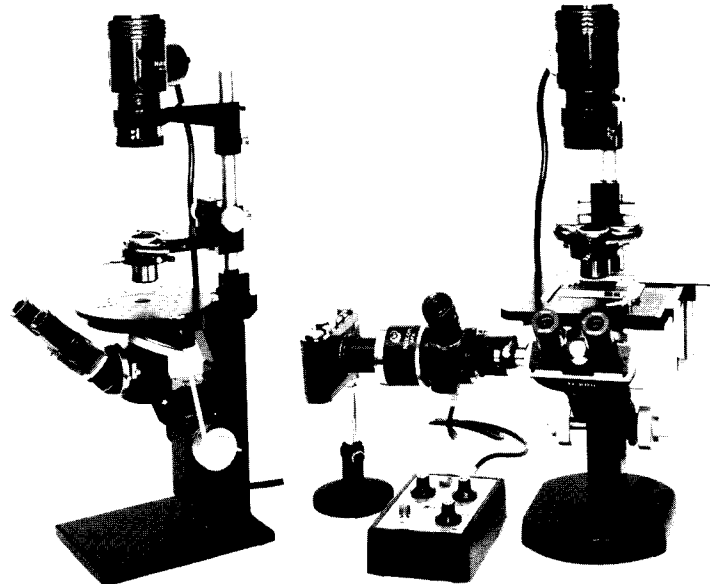
The round floating stage is preferred for most tissue culture work where chambers, flasks, or petri dishes are used. Its smooth gliding motion makes this stage very popular — special holders are available to hold petri dishes or test tubes.

The square mechanical stage version is especially useful where the MS is utilized in tissue typing with sedimentation plates; for immuno microscopy; and when microscope slides are

used. Special holders for sedimentation plates are available. Furthermore, the MS inverted microscope offers full photographic capabilities. A rotating lever diverts all of the image forming rays to the side photo tube. Any of the Microflex attachments can be coupled to the photo tube for still or cine-micrography. There is a built-in filter slider.

A new modification is available with a fixed stage and focusable optics, especially designed for use with micromanipulators.

The 6v/30w tungsten diascope illuminator is well suited to most applications. For those applications where higher light levels are needed, the 12v/100w quartz Halogen diascope illuminator is recommended. An episcopic illuminator for reflected light microscopy is also available.



Model MSFC with fixed gliding stage and focusable optics; Diascopic quartz-halogen illuminator

MSS — with mechanical stage, Quartz-Halogen Diascopic Illuminator and AFM Auto-Microflex on stand

- 76560 **Model MS Main Body** with quadruple revolving nosepiece, built-in tube for photomicrography, co-axial coarse and fine focusing knobs; **circular gliding stage** with lever motion attachable to right or left side (supplied with 4 stage plate adapters, 5mm, 10mm, 15mm, 20mm, 3 pair stage clips); vinyl instrument cover
- 76561 **Model MSS Main Body** with quadruple revolving nosepiece, built-in tube for photomicrography, co-axial coarse and fine focusing knobs; **square graduated stage** with built-in low position co-axial mechanical control, stage surface; 150mm x 150mm; vinyl instrument cover
- 76581 **Model MSFC Main Body**, with **fixed circular gliding stage** and **focusable optics** (especially recommended for use with micromanipulators)
- 76582 **Model MSFS Main Body**, as above, with **fixed square graduated stage** and **focusable optics** (especially recommended for use with micromanipulators)
- 76562 **Diascopic Tungsten Illuminator** MSD with focusable collector lens, field diaphragm and filter holders, support arm, column; 2 bulbs No. 77904, with 6v/30w transformer (76708)
- 76573 **Diascopic Quartz Halogen Illuminator** MSD, 12v/100w, including lamp housing with focusable collector lens, field diaphragm and filter holders; support arm column; continuously variable power supply with one bulb (76513) (condenser mount not included)
- 76567 **Condenser Mount MSD**, centerable, for transmitted illumination, with rack and pinion focusing
- 76565 **Episcopic illuminator MSE** with service table, 2 bulbs 6v/18w. #77910 (less transformer), with daylight, green and yellow filters
- 76171 **Transformer**, variable 6v/20w for MSE EPI illuminator
- 76571 **Polarizing Set** for MS Diascopic Illuminator
- 76572 **Polarizing Set** for MS Episcopic Illuminator
- 76570 **MS Test Tube Holder**
- 77098 **"MS" Auxiliary stand** for mounting M-35S with Microflexes; height adjustable 5-7 inches
- Filters for M & MS — 45mm diameter are listed on pages 23 & 32.**

### Tissue Culture Accessories

- 76593 M-line IN 61B Incubator circulating air type with fittings for mounting on Model M main body
- 76596 EPOI No. 17-504M Time Lapse Apparatus including special table top unit with base isolated from external vibrations, combination time lapse and normal speed cine drive, electronic timing controls and Bolex M5 Camera
- 76580 Sage Air Curtain Incubator Model 279, Range 30°C-40°C
- For complete listings of optics, see pages 21-26.**  
**For complete listings of photomicrographic accessories, see pages 28-32.**

### Suggested MS Inverted Phase Contrast Tissue Culture Configuration

- 76560 MS body with circular gliding stage and photo tube
- 76562 Diascopic tungsten 6v/30w illuminator on mounting column, with transformer
- 76567 Condenser mount
- 77750 Binocular body tube
- 77858 HKW-10x eyepieces, paired
- 77035 XLWD phase turret condenser with centering telescope, brightfield iris diaphragm, filters
- 77790 4x achromat objective
- 77020 DLL-10x phase achromat objective
- 77022 DLL-20x phase achromat objective
- 77809 DML-40x long-working-distance phase objective with correction collar
- 76569 Holder for 60mm diameter petri dish for use on MS-Rect. Mechanical Stage. Inserts for other sizes are available on special order.

### Options:

- (a) For use with slides, tissue typing and immuno microscopy, #76561 MSS body with square mechanical stage should be substituted for #76560 round stage type.
- (b) If 12 to 15mm condenser working distance is adequate, the more highly corrected #77049 LWD phase turret condenser should be substituted for #77035 XLWD type.
- (c) If photomicrography is a prime consideration, the #76573 diascope quartz halogen 12v/100w illuminator may be substituted for #76562 tungsten type, and an extra eyepiece must be purchased for the MS photo tube.

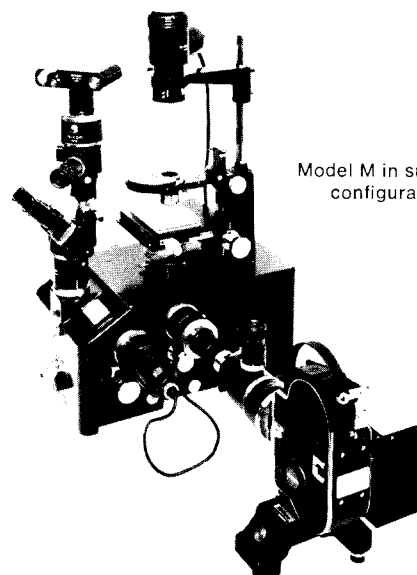
# Model M Research Inverted Microscope

The instrument of choice for tissue culture research. The massive unique box design of the M permits simultaneous still photomicrography from a trinocular eyepiece tube and cinemicrography through the side photo port. Allows use of a data illuminator to superimpose information onto the film. The stage is

located below the level of the eyepieces to afford ease in manipulating and changing specimens.

The stage assembly is especially designed to eliminate drifting, which ensures critically sharp time lapse cinemicrographs. The ultra-fine focus is located on the front control panel for pin-point precision control.

A 12v/100w quartz-halogen illuminator is available. The 6v/30w transformer for tungsten diascopic and episcopic illuminators is built into the microscope body.



Model M in suggested configuration

76502	<b>Inverted Microscope Model M:</b> main body with coaxial graduated mechanical stage; change-over Prism A (half-reflecting) and Prism B (full reflecting); 2 connecting tubes; built-in transformer with voltmeter; vinyl dust cover #76501; in fitted shipping case
76503	Circular Stage Rotating, Centerable Graduated for M (optional)
76505	Quadruple revolving nosepiece on dovetail slider
76510	Quintuple revolving nosepiece on dovetail slider
76512	Connecting Tubes replacement (2 — one each required for vertical and horizontal tubes)
76590	Fitted hardwood cabinet for Model M accessories, objectives and eyepieces
76555	Straight monocular tube, springloaded for cinemicrography
76520	Interference phase attachment for M with centering telescope for mounting on main body in place of connecting tube (The long working distance turret phase condenser, catalog No. 77042 is required for use with this attachment)
76538	<b>Diascopic M Tungsten Illuminator</b> , including lamp housing with focusable collector lens, field diaphragm and filter holders w/2 #77904 bulbs 6v/30w support arm, column and centerable condenser mount, with rack and pinion focusing
76545	<b>Diascopic M Quartz Halogen Illuminator</b> 12v/100w including lamp housing with focusable collector lens, field diaphragm and filter holders, support arm, column and centerable condenser mount, with rack and pinion focusing, continuously variable power supply, with one bulb (76513)
76535	<b>Episcopic M Tungsten Illuminator</b> including service table and 2 bulbs 6v/18w #77910; daylight, green and yellow filters
76517	Quartz Halogen Light Source, 12v/50w for Model M EPI Illuminator, with power supply and bulb (76516)
76540	Data illuminator and 2 #76907 bulbs 6v/18w
76519	Polarizing Set M Diascopic
76518	Polarizing Set M Episcopic
77099	"M" Auxiliary stand for horizontal mounting of Microflexes, height adjustable 4-6 inches

## Interchangeable Accessories for Both Models M & MS

76508	Quartz Halogen light source 12v/100w for conversion of Models M and MS Diascopic tungsten illuminator, with continuously variable power supply, with one bulb (76513)
76513	Quartz Halogen Bulb, 12v/100w (replacement)
77040	Phase Turret Condenser with 10x, 20x, 40x and 100x built-in phase annuli, iris diaphragm for brightfield; heat absorbing and green 33mm filters: phase centering telescope, in fitted case

## Suggested Model M Inverted Phase Contrast Configuration for Simultaneous Still Photomicrography and Automated Time-Lapse Cinemicrography (for culture flasks and culture chambers)

77162	DLL-40x apochromat phase objective
77163	DLL-100x apochromat phase objective
77759	"U" trinocular eyepiece tube
77858	HKW-10x eyepieces, paired
77857	HKW-10x eyepiece (for photo tube)
77060	AFM Auto-Microflex complete
77137	M-35S 35mm dark box
76555	Straight photo tube for side port
77857	HKW-10x eyepiece for photo tube
76540	Data illuminator
77119	CFMA Auto-cinemicrographic system with built-in photometer, motor drive and intervalometer for Bolex H-16
76585	Bolex H-16 J5 camera body
76543	Support base for Bolex camera
77049	Long-Working-Distance Phase Turret Condenser, with Centering Telescope, (12-15mm working distance) with 4 phase annuli: 10x, 20x, 40x and 100x; iris diaphragm for brightfield, green filter and heat absorbing filter, less case
77035	Extra-Long-Working-Distance Phase Condenser (40mm working distance) with 3 phase annuli: 10x, 20x and 40x, Brightfield iris diaphragm, heat absorbing and green 33mm filters, phase centering telescope, less case
77808	L40x Long-Working-Distance Brightfield Achromat objective, n.a. 0.60 with correction collar
77809	DML 40x Long-Working-Distance Phase objective, n.a. 0.60 dark contrast; medium with correcting collar
77041	Phase Centering Telescope only (replacement)
77910	Bulb, 6v/18w, round precentered for M and MSE EPI illuminator
77904	Bulb, 6v/30w, bayonet base, flat filament for M and MS Diascopic illuminator
76569	Holder for 60mm diameter petri dish for use on MS-Rect. Mechanical Stage.
76570	Test tube holder

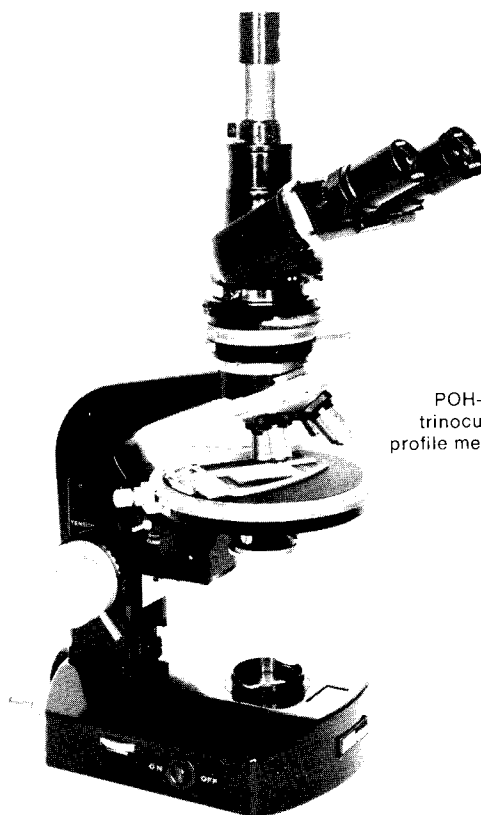
## Model POH-3 Research Polarizing Microscope

The POH-3 is a research Polarizing Microscope with an extra-long range of stage elevation and focusing. A maximum distance of 104.6mm from the objective shoulder to the stage surface makes it possible to mount the accessory Universal 4-axis stage that permits tilting of a specimen at any angle to the microscope optical axis.

A special 4-place revolving nosepiece with individually centerable objective receptacles is available. A dovetail adapter is also available to mount centerable single objective holders; these must be used if the graduated Babinet compensator is required. The special graduated circular rotatable stage has a goniometer divided into 1-degree increments; it reads to 6 minutes with either of two verniers placed 90° apart, and click stops at each 45° division. 45° click stops can be set at any optional point with a lever. A low-profile graduated mechanical motion with

point-count ratchets is also available.

The intermediate tube of the POH-3 contains: 1) a Bertrand lens for conoscopic observation; magnifier for reading Babinet compensator; 2) filter analyzer, rotatable 180°; 3) quarter wave and sensitive tint compensators. Because all of these components are contained in the intermediate tube, the eyepiece tubes can be changed without deterioration of optical performance. Monocular (IP), binocular (Y), and trinocular (F) eyepiece tubes are available. All have an inclination of 30° from the horizontal; the Y and F tubes have screw-in depolarizers. A precentered 6v/15w tungsten illuminator with transformer, rheostat and voltmeter is built into the POH-3 base. For reflected light, a 6v/15w Epi illuminator is available, which accepts the centerable single objective holders. A graduated Babinet compensator and a 6-order quartz wedge in slider are available accessories. The entire range of high quality Nikon strain-free polarizing objectives and special eyepieces can be used on the POH-3.



POH-3 with (F)  
trinocular and low  
profile mechanical stage

- 77205 Polarizing Microscope, POH-3 for 115v, A.C. consisting of: stand, built-in base illuminator with transformer, rheostat and voltmeter, 6v/15w pre-centered flat filament bulb; ball-bearing, graduated, circular rotatable stage; intermediate tube containing Bertrand lens, magnifier for reading Babinet compensator, 1/4 wave length and sensitive tint plates; Senarmont compensator, and 3 element condenser on dovetail slider with swing-out top element, iris diaphragm and rotatable filter polarizer, 2 bulbs (77903) and vinyl cover
- 77237 Attachable mechanical stage, low profile, 30x30mm for circular stages, with 2 sets of point-count ratchets
- 76058 Attachable mechanical stage, graduated, 30mm x 30mm, top control
- 77201 POH-3 as above, but with Koehler Illuminator base
- 76708 6v/30w Transformer with meter for use with No. 77201 POH-3 with Koehler base

### Body Tubes

- 77202 Polarizing Monocular eyepiece tube (IP), inclined 30°, takes 30mm diameter eyepieces, supplied with adapter for standard eyepieces
- 77246 Trinocular eyepiece tube (F), 2-way, prism (100% visual or 100% photo) inclined 30°, with depolarizer; magnification factor 1.25x, takes standard 25mm diameter eyepieces
- 77248 Binocular eyepiece tube (Y), inclined 30°, with depolarizer, takes standard 25mm diameter eyepieces
- 77247 Screw-in depolarizer for (F) and (Y) body tubes

### Eyepieces, 30mm For Inclined Monocular Tube IP

- 77204 Huygenian, wide-field, P 5x, with cross line reticle
- 77206 Huygenian, wide-field, P 7x, with cross line reticle
- 77208 Huygenian, wide-field, P 10x, with cross line reticle
- 77223 Adapter sleeve to fit standard eyepieces in #77202 (IP) (Replacement)

### Eyepieces, Standard for Trinocular Tube F

- 77855 High Eyepoint, compensating, HK 5x
- 77210 High Eyepoint, compensating, diopter adjustable, DHK 5x, with cross line reticle
- 77857 High Eyepoint, compensating, wide-field HKW 10x
- 77212 High Eyepoint, compensating, wide-field, diopter adjustable, DHKW 10x, with cross line reticle
- 77213 Micrometer reticle, 10mm in 100 graduations; replaces cross line reticle in DHKW eyepiece
- NOTE: One each HK 5x and DHK 5x or HKW 10x and DHKW 10x are required for binocular observation. An eyepiece micrometer holder sleeve is supplied separately to change from cross line reticle to

### Nosepieces

- 77214 Single objective holder adapter on dovetail, with slot for Babinet compensator
- 77216 Single objective holder with centering screws (one required for each objective)
- 77217 Set of 4 single objective holders (77216)
- 77218 Quadruple revolving nosepiece, on dovetail, with individually centerable objective receptacles (cannot be used with Babinet compensator)

### Strain Free Objectives For Transmitted Light

- 76802 Achromat, P 4x, n.a. 0.10
- 76804 Achromat, P 10x, n.a. 0.25
- 76806 Achromat, P 20x, n.a. 0.40
- 76810 Achromat, P 40x, retractable, n.a. 0.65
- 76815 Achromat, P 100x, oil, retractable, n.a. 1.25

### Strain Free Flat Field Objectives For Transmitted Light

- 76840 Plan achromat, Plan P 4x, n.a. 0.10
- 76842 Plan achromat, Plan P 10x, n.a. 0.25
- 76844 Plan achromat, Plan P 40x, retractable, n.a. 0.65
- 76846 Plan achromat, Plan P 100x, oil immersion, retractable, n.a. 1.30



### Additional Accessories

77224	Babinet compensator on slider, graduated, in wooden case
76825	Quartz Wedge in slider, 6-order, non-graduated (for POH-3 & SPO)
77230	Filter, daylight, 27.3mm
76930	Filter, green, 546mu, 33mm
76463	Dovetail condenser holder (for interchanging condensers)
77234	Epi-illuminator, w/filter polarizer 90° rotatable, lamp housing, collector lens, aperture and field diaphragms and filter holder with 2 16mm filters: daylight and green, (less transformer), 1.2x magnification factor
76171	6v/20w transformer for above
77235	Quartz-Halogen Light Source, 12v/50w, for POH-3 EPI, with power supply, bulb and adapter ring
77242	Filter, daylight 16mm (replacement)
77243	Filter, green, 16mm (replacement)
77244	Filter, yellow, 16mm (replacement)

### Strain Free Objectives For Opaque Specimens For Use With EPI Illuminator

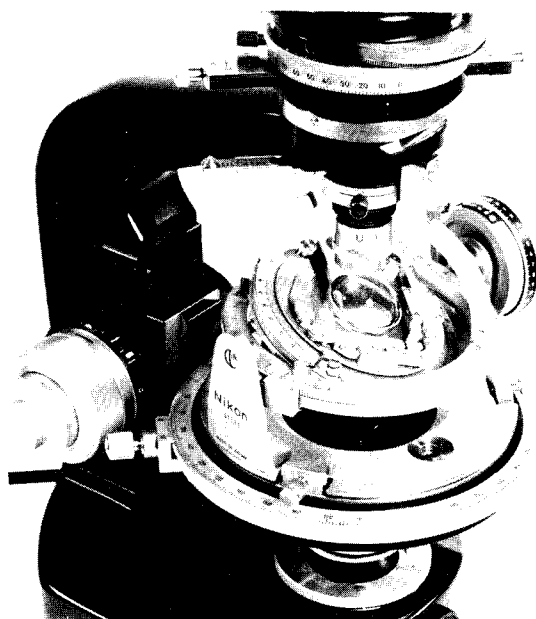
76813	Achromat PM 5x, n.a. 0.10
76814	Achromat PM 10x, n.a. 0.25
76811	Achromat PM 20x, n.a. 0.40
76812	Achromat PM 40x, n.a. 0.65 retractable
76817	Achromat PM 100x, n.a. 1.25, oil immersion, retractable

### Universal 4 Axis Stage

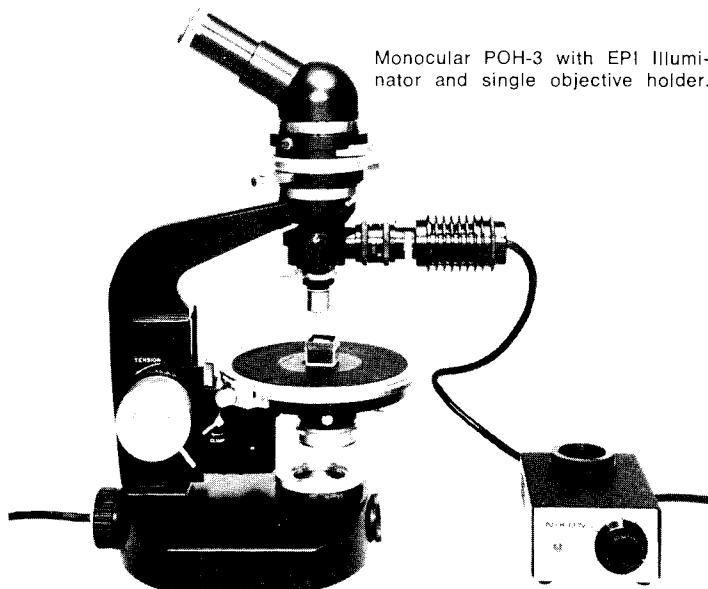
77240	Universal Stage, 4 axis with 3 pairs of 13.5mm diameter hemispheres with ND 1.516, 1.556 and 1.649, stage plate, 2 centering screws and fitted case
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### Long Working Distance Objectives For Use With Universal Stage

77250	Achromat U 5x, n.a. 0.10
77252	Achromat U 10x, n.a. 0.22
77254	Achromat U 20x, n.a. 0.33



Monocular POH-3 with EPI Illuminator and single objective holder.



### Suggested Configurations

#### Monocular Polarizing Microscope, POH-3 (M) consisting of:

77205	Basic Stand
77202	Monocular Eyepiece Tube IP
77204	Huygenian Eyepiece POH 5x with cross line reticle
77206	Huygenian Eyepiece POH 7x with cross line reticle
77208	Huygenian Eyepiece POH 10x with cross line reticle
77214	Single objective holder adapter
77217	Set of 4 single objective holders
76802	Achromat objective P 4x
76804	Achromat objective P 10x
76810	Achromat objective P 40x
76815	Achromat objective P 100x (oil)
77224	Babinet Compensator
77230	Daylight filter, 27.3mm
76930	Green filter, 33mm
77237	Low Profile Mechanical Stage
77523	Fitted Hardwood Cabinet

#### Trinocular Polarizing Microscope, POH-3 (F) consisting of:

77205	Basic Stand
77246	Trinocular Eyepiece Tube (F) with depolarizer
77855	Eyepiece HK 5x
77210	Eyepiece DHK 5x with cross line reticle
77857	Eyepiece HKW 10x
77212	Eyepiece DHKW 10x with cross line reticle
76802	Achromat objective P 4x
76804	Achromat objective P 10x
76810	Achromat objective P 40x
76815	Achromat objective P 100x (oil)
77213	Micrometer holder sleeve with 10/100 reticle
77218	Quadruple revolving nosepiece, indiv. centerable
77230	Daylight filter, 27.3mm
76930	Green filter, 33mm
77237	Low Profile Mechanical Stage

For photomicrographic equipment and other microscope accessories that can be used with the POH-3, see pages 28-32.

## Model SPO Polarizing Attachment

The polarizing microscope is used to examine birefringent properties in animal and plant tissues, as well as in rocks, minerals, metals, fibers and chemicals. The SPO Polarizing Attachment is designed to form a modern polarizing microscope when used on models S-Cb/D6 & S-Cb/D6QH, S-Kt, S-Ke and L-Ke.

The attachment is provided with a Sénarmont type compensator (equipped with a special quarter-wavelength retardation plate). Measurement of retardation can be readily taken with great accu-

### Specifications:

**Eyepieces** High-eyepoint HK 5x, field number 21.

High-eyepoint DHKW-10x, field number 18, diopter adjustable type. Provided with crossline reticle and locating pin.

**Eyepiece micrometer with eyepiece sleeve** 10mm scale, 1 division 0.1mm. An extra eyepiece sleeve is available as optional equipment for use with the micrometer.

**Condenser** Abbe-type double-lens N.A. 1.30, with iris diaphragm (conoscopic and orthoscopic observation possible). Conoscopic angle 82 degrees.

**"CgC" graduated centerable circular rotatable stage** 140mm in diameter, 360-degree rotatable, Goniometer is divided in 1-degree increments and read to 6' with vernier.

Centering and clamping knob and 2 clips are provided.

**Polarizer** Polarizing plate is made of "Mitsubishi Dichrome" and detachable from the condenser. Rotating angle graduations (0°, 90° and 270°).

**Analyzer** Analyzing plate is made of "Mitsubishi Dichrome"

racy, and a desired retardation can also be obtained.

The retention of the revolving "S" type nosepiece permits quick and accurate change of objectives. The specially designed graduated circular rotating stage does not require recentering after selecting a previously centered objective. The horizontal position of the stage eliminates flow in a liquid- or oil-immersed specimen.

The eyepieces employed are the wide-field, high-eyepoint type allowing observation over a wide field by spectacle wearers as well as normal sight observers. The objectives are strain-free and parfocal. The dimensions of the specimen can be measured by an eyepiece micrometer.

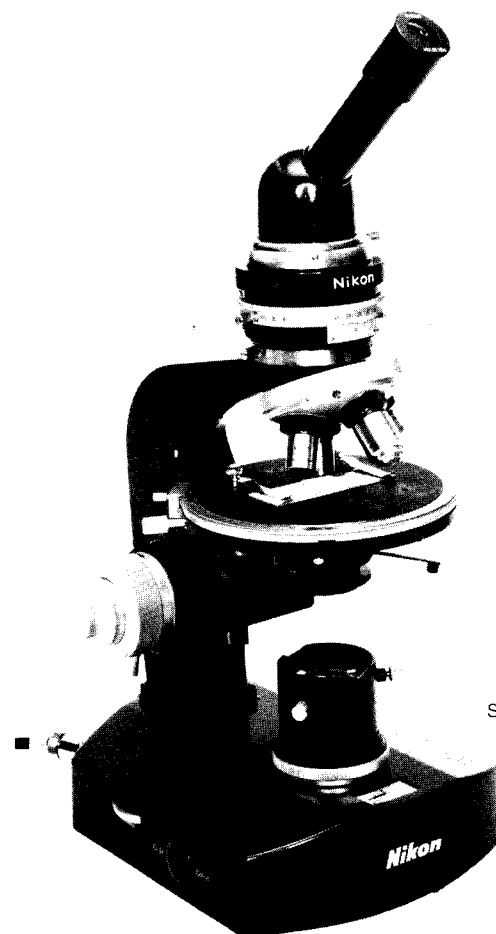
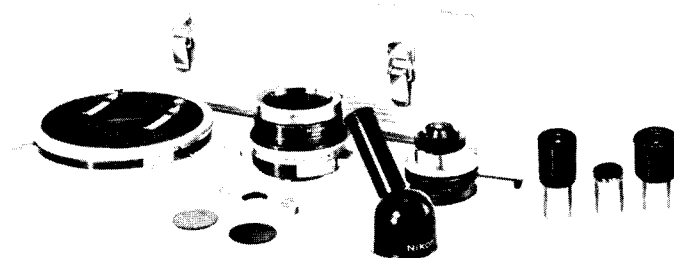
and mounted in the intermediate analyzer tube. The plate is put in or out of the light path and is rotatable 180° by means of a lever. The rotation angle is read to 2° directly and 6' with vernier.

**Bertrand lens** Mounted in the analyzer tube. Can be rotated into or out of the light path. Position of the lens is preadjusted, so further adjustment is unnecessary.

**1/4 wavelength retardation plate and tint plate** A 1/4-wavelength retardation plate ( $\lambda = 589m\mu$ ) and tint plate ( $R = 530m\mu$ ) are mounted on a slider which is inserted into a slot in the analyzer tube. Used for measuring the crystal axis, positive or negative direction, weak birefringence, etc.

**Compensator** Sénarmont type (a type of 1/4-wavelength retardation plate,  $\lambda = 546m\mu$ ) mounted on a slider which replaces the slider of the 1/4-wavelength retardation plate and tint plate. For accurate measurement of retardation.

SPO set supplied complete with monocular eyepiece tube, two filters, daylight mat and 546m $\mu$  green, and fitted wooden case.



SPO set on  
S-Kt Compact  
Stand

### 76800

**SPO Polarizing set, complete, consisting of the following components.**

76821*	Intermediate analyzer tube equipped with Bertrand lens and with 1/4 slider with 1/4 wave and tint plates
76828*	"Sénarmont" type compensator
77781	Rotatable circular centerable graduated stage with 2 clips (CgC)
76832*	Condenser with polarizer n.a. 1.25
77212	DHKW-10x eyepiece with cross line reticle
77855	HK 5x eyepiece
76913	Daylight diffusing blue filter
76930	Green filter 546m $\mu$
76836*	Fitted wooden case
76820	Inclined monocular tube SPO

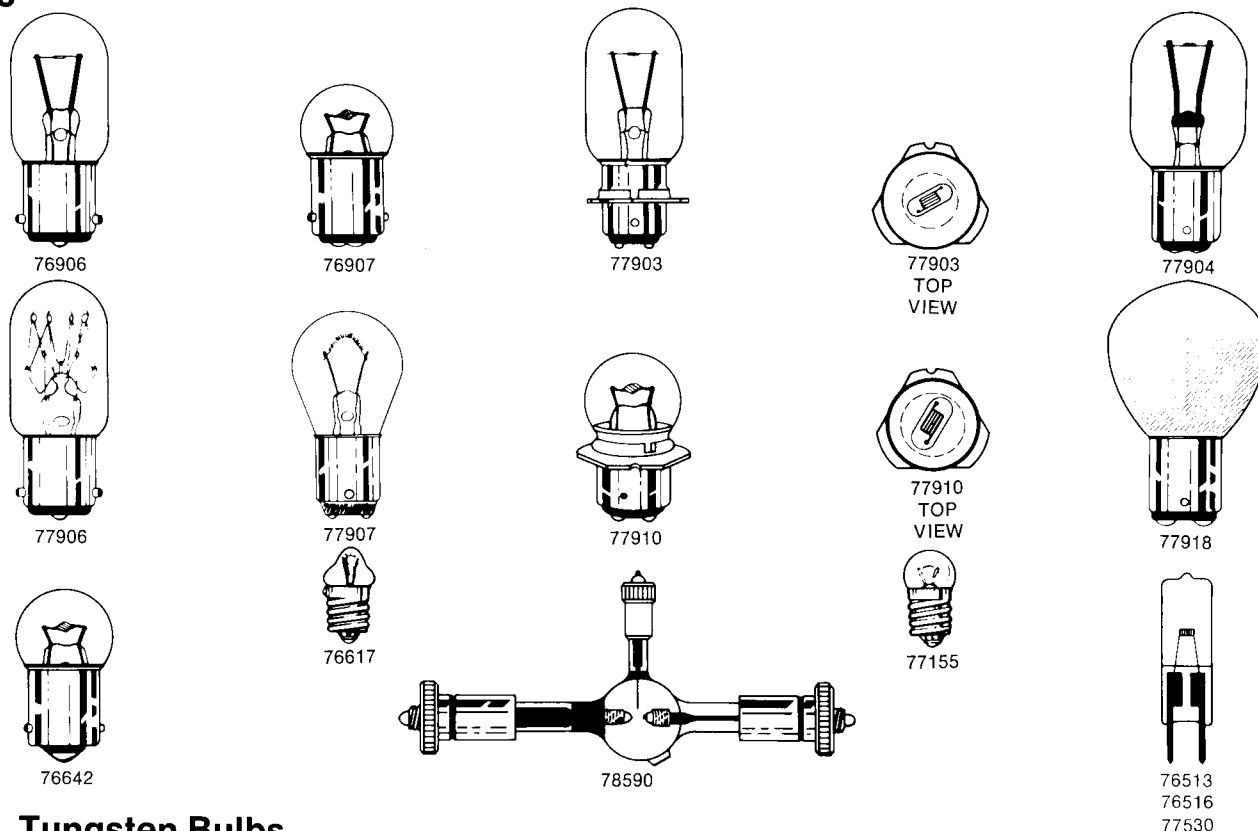
\*Components (available only on special order)

### Suggested Student Polarizing Microscope Configuration

77540	S-Cb/D6 QH microscope stand with quartz-halogen illuminator
77528	Replacement QH bulbs for 77540 (two)
76800	SPO polarizing set, complete
77529	Carrying case for S-Cb (optional)

**NOTE:** The SPO set should be used only with strain-free objectives listed on pages 15 and 26.

## Bulbs



## Tungsten Bulbs

Product #	Description	Fits Instruments:
76617	2.2v Miniature screw base	Model "H"
76642	6v/12w, double contact bayonet base, frosted	EPOI Inverted
76906	6v/15w, bayonet base, flat filament, oval shape	SU, Model 1 EPI, Stereo Illuminator (old)
76907	6v/15w, bayonet base, flat filament, round shape	Stereo Illuminator Model 2 (new)
▲ 77066	6v Miniature screw base	AFM Microflex Body pilot light
77155	3v Miniature screw base (GE No. 365)	Teaching Head Illuminator
77412	115v/30w, bayonet base, SUBSTITUTE 77427	"CL" Classic Binocular
▲ 77427	115v/20w, bayonet base half silvered reflector	"CL" Classic, S-Cb/D115, S-Cb/115
77903	6v/15w, bayonet precentered flange, flat filament	S-Kt, POH-3
77904	6v/30w, bayonet base, flat filament	S-Ke, L-Ke, M, MS, Apophot Tungsten, Multiphot Diascopic, Universal Illum. & FL-200 Tungsten
77906	110v/20w, bayonet base, SUBSTITUTE 77427	S, G, Classic Monocular
77907	6v/18w, bayonet base	S-Cb/D6, "S" substage
77910	6v/18w, bayonet precentered flange, flat filament	EPI Model 2, Differential "R", M&MS EPI, POH EPI
77918	115v/20w, bayonet base, reflector, blue frosted	SU 115v

## Quartz-Halogen Bulbs

76513	12v/100w, Quartz-Halogen bulb, 2 pin base	All 100w Quartz-Halogen Illuminators
76516	12v/50w, Quartz-Halogen bulb, 2 pin base	All 50w Quartz-Halogen Illuminators
77528	6v/20w, Quartz-Halogen bulb, 2 pin base	S-Cb/D6 QH
▲ 77530	Q.H. Conversion Adapter Plug for 77528	Converts S-Cb/D6 to S-Cb/D6 Q.H.
77771	21v/150w, Quartz-Halogen dichroic reflector	Fiber Optics Illuminator

## Special Bulbs: Xenon, Mercury, Etc.

▲ 76461	150w Xenon Arc Burner	Apophot Xenon Illuminator
▲ 78153	450w Xenon Arc Ozone-free Burner	Micropan
▲ 78580	200w USH200D Super High Pressure Mercury Burner	Apophot "FL" Illuminator
78590	200w HBO200 Super High Pressure Mercury Burner	FL200, FT200
▲ 79883	200 Watt-Second Electronic Flash Tube	Electronic Flash

▲ Not illustrated

## Illuminators

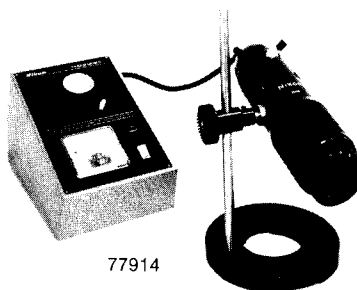
The 6-volt tungsten light sources are still the most popular and utilize the least expensive bulbs. The color temperature of tungsten illumination is approximately 3000°K. Both the 6v/18w Stereo Illuminator and the 6v/30w Universal Microscope Lamp are free-standing units that offer total flexibility of usage. They may be used for microscope illumination as well as side lighting for reflected light photomicrography with the MULTIPHOT. The Universal Microscope Lamp is a high intensity low voltage

Koehler illuminator for all types of microscopy, photomicrography, and photomacrography. Its focusable aspheric condenser lens system with iris diaphragm can be used for true Koehler illumination with virtually no glare or flare.

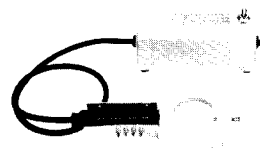


76153

**Note: Replacement bulb listings — page 17.**



77914



76495

- 77914 Universal Microscope Koehler Illuminator 6v/30w, with iris diaphragm, continuously variable transformer with voltmeter, and 2 bulbs. (No. 77904)
- 76153 Stereo illuminator, Model 2, including continuously variable transformer 6v/3a, with on/off switch; swivel mounting bracket and 2 bulbs. No. 76907
- 76156 Spotlight attachment for Stereo Illuminator
- 76708 Transformer 6v/30w, (variable) with meter
- 76171 Transformer, solid-state continuously variable, with on/off switch 6v/20w
- \*77916 Attachable Koehler illuminator with 6v/20w, continuously variable transformer (For S Bodies only)

\*Discontinued item (Available until stock is depleted)

### Stereo Microscope Illuminators — Attachable

- 76495 Cool Ring Illuminator (cold cathode) with transformer
- 76493 Cool Ring lamp only with reflector (replacement)
- 76491 Dual Ring with transformer (76494)
- 76492 Dual Ring lamp only (replacement)
- 76489 Dual Ring reflector only
- 76494 Transformer only (replacement for Cool Ring or Dual Ring)

## EPI Illuminator and Accessories

The EPI-Illuminator is an intermediate attachment that is interposed between the eyepiece tube and the objective to furnish "on-axis" illumination. Its beam of light is sent directly through the objective onto the specimen surface. Translucent specimens, such as some minerals, can be examined by combined reflected and transmitted light utilizing the different color filters supplied for contrast. The EPI's optical system fulfills all of the requirements for Koehler illumination; there is a 1.5x magnification factor. It is normally supplied with a 6v/18w tungsten light source, but can be mounted with a 12v/50w quartz-halogen source.



76994

- 76994 EPI ILLUMINATOR Model 2, for S-Cb, S-Kt, S-Ke, L-Ke, with daylight, green and yellow filters, 2 #76910 bulbs and variable transformers, 6v/20w
- 76995 Polarizing Attachment for EPI Model 2 with filter polarizer and analyzer

The following objectives (with prefix M) are Metallurgical type, and are recommended for use with the EPI Illuminator for opaque specimens.

- 77832 Achromat M 5x n.a. 0.10, work. dist. 15mm.
- 77833 Achromat M 10x n.a. 0.25, work. dist. 7.1mm.
- 77834 Achromat M 20x n.a. 0.40, work. dist. 5.7mm
- 77837 Achromat M 40x n.a. 0.65, retractable, work. dist. 0.52mm
- 77836 Achromat M 100x oil, n.a. 1.25, retractable, work. dist. 0.16mm
- 77813 Plan Achromat M 10x n.a. 0.25, work. dist. 7.0mm
- 77811 Plan Achromat M 20x n.a. 0.40, work. dist. 1.6mm
- 77812 Plan Achromat M 40x n.a. 0.65, retractable, work. dist. 0.24mm
- 77814 Plan Achromat M 100 n.a. 1.30, retractable, work. dist. 0.12mm

## Electronic Flash

This 200-watt-second electronic flash is designed to freeze motion of living specimens, as well as specialized applications for photomicrography of fixed specimens. It can be installed on models S-Ke, L-Ke, APOPHOT, M and MS. A unique relay lens system allows use of the standard 6v/30w tungsten illumination source for normal visual observation while the electronic flash

is in firing position. The #79885 version is designed for use on the EPI Illuminator or the Differential-Interference Type R.

- 79882
- 79885
- 79883

Electronic flash includes illuminator housing with flash tube, power pack and cord. Maximum output 200 watts/sec. (for S-Ke, L-Ke, Apophot) Same as above for EPI Illuminator and Differential Interference Attachment Type R Flash tube only (replacement)



79882

## Quartz-Halogen Light Attachment

Quartz-halogen (also known as quartz-iodine or tungsten-halogen) light sources have a greater light output than regular tungsten, and their special characteristics are responsible for their rapidly increasing usage. The tungsten lamp filament in iodine halogen gas within a quartz envelope continues to burn at a

constant 3200°K. temperature (ideal for photomicrography) without darkening the quartz envelope, throughout the entire life of the lamp. The spectral emission of the Q.H. lamp peaks at 385nm, which is ideal for the new FITC fluorescence technique (p. 36). The Q.H. lamps are relatively inexpensive and are ideal for applications such as phase contrast and differential interference, where high light levels are advantageous.



76983

### 12v/50w Quartz-Halogen

These Quartz-Halogen light sources are available to convert the following EPI Tungsten Illuminators for increased illumination.

- 76983 Q.H. Conversion for Model 2 EPI (76994)
- 76984 Q.H. Conversion for Differential Interference Type R (76985)
- 77235 Q.H. Conversion for Model POH-2 EPI (77234)
- 76517 Q.H. Conversion for Model M EPI (76535) — power supply not required

Complete units consist of: Lamp Housing with Socket (#76509), Power Supply (#76508), Bulb (76515), and adapter, if required.  
76516 Quartz-Halogen Bulb, 12v/50w (replacement)

### 12v/100w Quartz-Halogen

76508

Quartz-Halogen Light Source 12v/100w for conversion of Models M and MS Diascopic Tungsten Illuminator; with continuously variable power supply; one bulb (76513)

76459

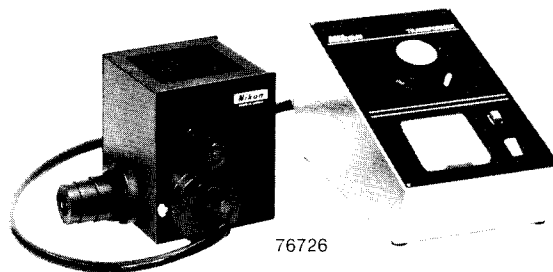
Quartz-Halogen Light Source 12v/100w; adapter collar for Apophot; continuously variable power supply and one bulb (76513)

\*76726

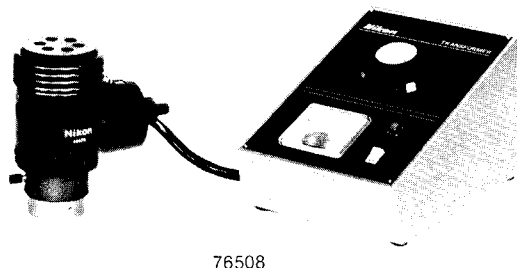
Quartz-Halogen Light Source 12v/100w for S-Ke and L-Ke Microscopes. With relay lens system; continuously variable power supply; one bulb (76513)

76513

Quartz-Halogen Bulb, 12v/100w (replacement)



76726



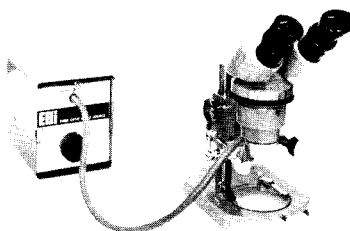
76508

## Fiber Optic Illuminators

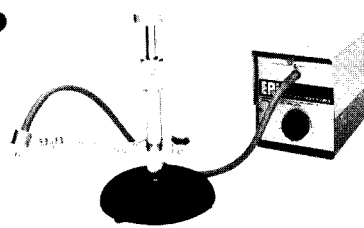
A new series of fiber optic illuminators is now available which utilizes a 150w quartz-halogen lamp in a heat-reducing dichroic

reflector. These illuminators offer extremely intense pin-point illumination with minimum heat output. The #77637 fiber optic illuminator on #77645 telescoping stand is ideal for reflected light photomicrography with the MULTIPHOT; a pair of units is recommended for side-lighting.

- 77637 Fiber optic quartz-halogen 150w illuminator with power supply and ball joint mount
- 77645 Telescoping table stand for #77637 illuminator (extends 12")
- 77771 DNF lamp, 150w Q.H. with dichroic reflector for #77637 (replacement)



77637 with SMZ  
Zoom Stereo #76000



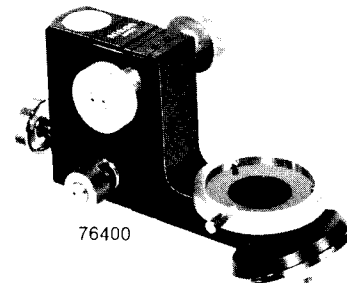
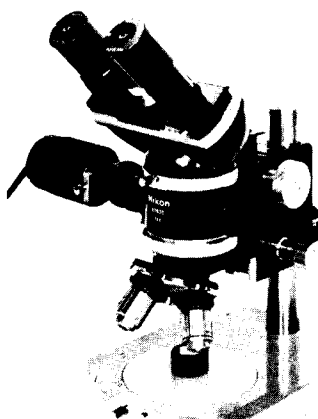
77637 on 77645  
Telescoping Stand

**Note: Replacement bulb listings — page 17.**

## Modular Focusing Mount

This module is designed for special microscope applications when an EPI illuminator or Differential Type R is used with an eyepiece tube, oculars, and objectives. Separate coarse and fine focus controls are located on both sides of the modular mount.

- 76402 Modular Focusing Mount with single objective nosepiece
- 76400 Same as above, but with triple revolving nosepiece
- 76404 Same as above, but with quadruple revolving nosepiece
- 76013 Plain Stand only
- 76135 Universal Table Stand Type 3 (plain)
- 76140 Universal Table Stand Type 4 (with rack & pinion motion for boom arm extension control)
- 76139 Universal Table Stand Type 3 on Large Platform Base

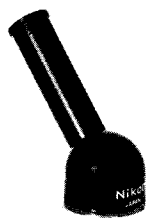


76400

On Stereo Plain  
Stand (76013) with EPI  
Illuminator (76994)

## Accessories

### Body Tubes



77740 (I)



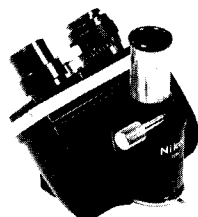
77747 (A)



77750 (B)



77751 (Y)



77759 (U)



77753 (F)



77745 (V)

### Body Tubes

- 77740 (I) Monocular, 45° inclination  
 77747 (A) Monocular, with 30° inclination and vertical photo tube, 2 way prism: 100% visual; 100% photo "Monocular-Monocular"  
 77750 (B) Binocular, 45° inclination  
 77751 (Y) Binocular, 30° inclination  
 77759 (U) Trinocular, 45° inclination; 3-way sliding prism: 1. 30% visual, 70% photo, 2. 100% visual, 3. 100% photo

77753

(F) Trinocular, with 30° inclination from the horizontal, 2 way prism: 100% visual; 100% photo. 1.25 magnification factor

77745

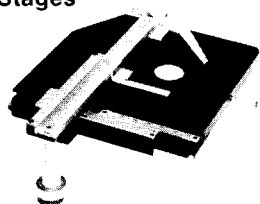
(V) Vertical Monocular Photo Tube

77247

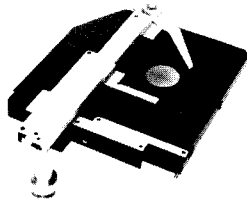
Depolarizer for (F) and (Y) Tube

NOTE: The (F) and (Y) body tubes are recommended for polarization microscopy; both accept #77247 depolarizer. The (A), (F), and (U) body tubes require an extra eyepiece for the photo tube.

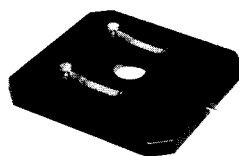
### Stages



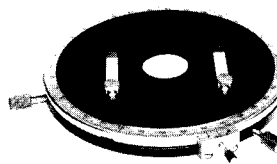
77765 (R)



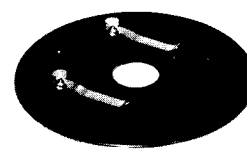
78525 (RS)



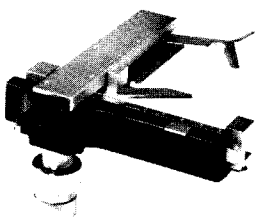
77775 (P)



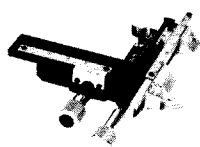
77781 (CgC)



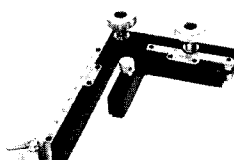
77770 (C)



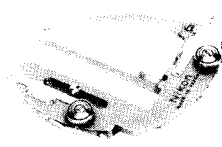
77773 (Ge)



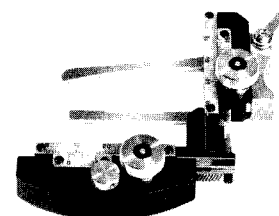
77785 (J)



77784



77237



76058

### Stages

- 77765 "R" Rectangular, graduated, with built-in low position co-axial mechanical control, stage surface: 130mm x 140mm; travel 50mm x 75mm  
 78525 "RS" Stage, as above with concentric grooves for use with ultra darkfield oiled condenser; especially for use in fluorescence microscopy  
 77775 "P" Square plain stage, 130mm x 130mm  
 77781 "CgC" Centerable, graduated, circular, rotatable; stage surface: 140mm Diam.  
 77770 "C" Circular gliding stage, stage surface: 140mm Diam.

### Attachable Mechanical Stages

- 77773 "Ge" attachable low position co-axial mechanical with 76mm x 25mm movement  
 77774 Same, but left hand model  
 77785 "J" Attachable mechanical for "C" or "P" stages, 50mm x 30mm movement  
 77783 Same, but with 75mm x 50mm movement  
 77784 Attachable mechanical, top control, 66mm x 28mm movement  
 77237 Attachable graduated mechanical stage, low profile, 30 x 30mm, with point-count ratchets for circular stages  
 76058 Attachable graduated mechanical stage, 30 x 30mm for circular stages

## Selecting the Correct Objectives and Eyepieces

Careful thought should be given to the proper selection of optics to achieve the required image quality and resolution. Nikon's modular design concept facilitates tailoring the microscope to the user. Some necessary basic considerations are:

How critical are the resolution requirements?

Are highly corrected, relatively costly, fluorite or apochromatic objectives necessary?

Which oculars are correct?

Objectives are generally classified into three categories, describing the degree of correction of chromatic and spherical aberrations.

**ACHROMATS** are chromatically corrected for two colors and spherically corrected for one color. They are suitable for visual observation and photomicrography with either color or black and white films. Image quality in black and white photomicrography can be improved by the use of a green filter.

**SEMI-APOCHROMATS** or **FLUORITES** are a compromise between the economy of the achromat and the high performance of the apochromat. They are chromatically corrected for two colors and spherically corrected for two colors. Improved aberration correction results in sharper contrast and higher numerical apertures. The higher n.a. offers increased resolution and the improved corrections make for better visual and photo images.

**APOCHROMATS** are corrected chromatically for three colors and spherically for two colors. These optimum corrections allow the highest n.a. for unexcelled resolution. Apochromats are the finest objectives for both visual examination and photomicrography and are especially recommended for best color rendition. **"PLAN" OBJECTIVES:** For specific applications such as visual examination of smears or thin sections and for large format photomicrography, it is desirable to have the entire field of view in sharp focus. Superior photomicrographs and low fatigue from

prolonged viewing of flat specimens justify the higher relative prices of such "plan" or "flat field" objectives, which are available in achromatic, fluorite, and apochromatic corrections.

**EYEPIECE (OCULAR)** selection is a less difficult task than objective selection. Inexpensive Huygenian eyepieces are recommended for use with low power achromat objectives only. When employing high power achromats, fluorites or apochromats, either regular or flat field, a "compensating" eyepiece should be selected. This compensation actually improves color correction in addition to magnifying the image from the objective. The "high-eyepoint" eyepiece is especially recommended, as it reduces eye fatigue and eliminates the hazard of scratching either ocular or spectacle lenses for eyeglass wearers. The widefield type of ocular provides a larger apparent image, which is more relaxing to view. The Nikon HKW eyepieces fulfill all of these recommendations.

A high-magnification objective and a low-magnification eyepiece give the best resolving

power. A low-power objective and a high-power eyepiece give the greatest depth of focus.

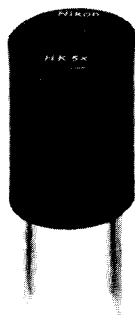
**TOTAL MICROSCOPE MAGNIFICATION** is computed by multiplying the objective magnification by the eyepiece (ocular) magnification. This total may be increased by a body tube or intermediate attachment tube factor. Examples:

- 1) 40x objective  
x 15x eyepiece  
600x total magnification
- 2) 10x objective  
x 10x eyepiece  
100x  
x 1.25x teaching head tube factor  
125x total magnification
- 3) 20x objective  
x 8x eyepiece  
160x  
x 1.5x Epi illuminator tube factor  
240x  
x 1.25x "F" Trinocular tube factor  
300x total magnification

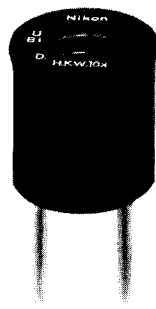
## Eyepieces



77881



77855



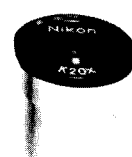
77880



77857



77861



77863



78164

- 77855 High eyepoint, compensating HK 5x, field no. 21.0  
77856 High eyepoint, compensating HK 5x, paired  
77881 High eyepoint, compensating widefield HKW 8x, field no. 18.6  
77882 High eyepoint, compensating widefield HKW 8x, paired  
77857 High eyepoint, compensating widefield HKW 10x, field no. 18.0  
77858 High eyepoint, compensating widefield HKW 10x, paired  
77861 High eyepoint, compensating wide angle HKW 15x, field no. 14.0  
77862 High eyepoint, compensating wide angle HKW 15x, paired  
77863 Compensating K 20x, field no. 8.0  
77864 Compensating K 20x, paired  
77865 Huygenian, widefield HW 10x, field no. 17.5  
77866 Huygenian, widefield HW 10x, paired

The following eyepiece contains a picture frame for 35mm. format and should be ordered for the "U" "F" and "MM" heads.

77880 DHKW 10x photo eyepiece w/picture frame, field no. 18.0

### Polarization Eyepieces

- 77210 High Eyepoint, compensating, diopter adjustable, DHK 5x, with cross line reticle  
77212 High Eyepoint, compensating, widefield, diopter adjustable, DHKW 10x, with cross line reticle

### Large diameter, for POH Polarizing IP Monoc

- 77204 Huygenian, widefield, P 5x, with cross line reticle  
77206 Huygenian, widefield, P 7x, with cross line reticle  
77208 Huygenian, widefield, P 10x, with cross line reticle

### Projection Eyepiece

- 78164 3.2X with adapter collar for projection mirror housing #78162 (requires #77158 eyepiece holder)

## Objectives



77827



77842



77825



77808



77810



77795



77798

### Achromat Objectives

77790	Achromat 4x, n.a. 0.10, work. dist. 9.50mm
77795	Achromat 10x, n.a. 0.25, work. dist. 7.10mm
77800	Achromat 20x, n.a. 0.40, work. dist. 5.70mm
77810	Achromat 40x, n.a. 0.65, retractable, work. dist. 0.54mm
77820	Achromat, oil, 100x, n.a. 1.25, retractable, work. dist. 0.16mm
77897	Funnel Stop for darkfield use of 77820
77825	Achromat, oil, 100x, n.a. 1.25, with iris diaphragm for darkfield, work. dist. 0.16mm
77835	Achromat 40x, NCG, n.a. 0.65, for uncovered slides, retractable, work. dist., 0.52mm

### Flat Field Achromat Objectives

77826	Plan 1.2x with iris diaphragm, n.a. 0.03, work. dist. 29.7mm
77827	Plan 2x with iris diaphragm, n.a. 0.05, work. dist. 35.6mm
77828	Plan 3x with iris diaphragm, n.a. 0.08, work. dist. 28.6mm
77891	Spectacle Lens Condenser (for use with above objectives)
77794	Plan Achromat 4x, n.a. 0.10, work. dist. 18.2mm
77796	Plan Achromat 10x, n.a. 0.25, work. dist. 7.0mm
77797	Plan Achromat 20x, n.a. 0.40, work. dist. 1.6mm
77806	Plan Achromat 40x, n.a. 0.65, retractable, work. dist. 0.24mm
77821	Plan Achromat, oil, 100x, n.a. 1.30, retractable, work. dist. 0.12mm
77807	Plan Achromat 40x, NCG n.a. 0.65, for uncovered slides, retractable, work. dist. 0.32mm

### Special Objectives

77841	Plan Fluorite 40x, n.a. 0.75, retractable, work. dist. 0.45mm
77845	Apochromat 40x, n.a. 0.80, retractable, work. dist. 0.19mm
77842	Fluorite 70x, oil, n.a. 1.25, retractable, work. dist. 0.16mm
77843	Dark field funnel stop for 77842
77847	Apochromat, oil, 100x n.a. 1.40, retractable, work. dist. 0.10mm
77850	Plan Apochromat, oil, 100x n.a. 1.30, retractable, work. dist. 0.12mm
77808	Long-Working-Distance L 40x Achromat, n.a. 0.60, with correction collar, work. dist. 2.0mm
77809	DML 40x Long-Working-Distance Phase, n.a. 0.60 dark contrast; medium, with correcting collar, work. dist. 2.0mm

### Water Immersion Objectives

77798	Achromat W 10x n.a. 0.22, work. dist. 0mm to 2.0mm
77803	Achromat W 20x n.a. 0.33, work. dist. 0mm to 2.0mm
77804	Achromat W 40x n.a. 0.65, retractable, work. dist. 0.74mm

### Special Phase Objectives for Combined Phase Fluorescence

78540	DLL-F 10x Achromat, n.a. 0.25, work. dist. 7.10mm
78541	DM-F 100x oil, Achromat with iris diaphragm, n.a. 1.25, work. dist. 2.0mm

### Metallurgical Objectives (for use with EPI Illuminator)

77832	Achromat M 5x n.a. 0.10, work. dist. 15.0mm
77833	Achromat M 10x n.a. 0.25, work. dist. 7.10mm
77834	Achromat M 20x n.a. 0.40, work. dist. 5.70mm
77837	Achromat M 40x n.a. 0.65, retractable, work. dist. 0.52mm
77836	Achromat M 100x n.a. 1.25, retractable, work. dist. 0.16mm
77813	Plan Achromat M 10x n.a. 0.25, work. dist. 7.0mm
77811	Plan Achromat M 20x n.a. 0.40, work. dist. 1.6mm
77812	Plan Achromat M 40x n.a. 0.65, retractable, work. dist. 0.24mm
77814	Plan Achromat M 100x n.a. 1.30, retractable, work. dist. 0.12mm

### Strain Free Objectives (for polarizing microscopy)

76802	P 4x strain free Achromat, n.a. 0.10 work. dist. 9.50mm
76804	P 10x strain free Achromat, n.a. 0.25, work. dist. 7.0mm
76806	P 20x strain free Achromat, n.a. 0.40, work. dist. 5.70mm
76810	P 40x strain free Achromat, n.a. 0.65, retractable, work. dist. 0.54mm
76815	P 100x oil, strain free Achromat, n.a. 1.25, retractable, work. dist. 0.16mm

### Flat Field Objectives, Stain Free (for polarizing microscopy)

76840	Plan achromat, Plan P 4x, n.a. 0.10, work. dist. 18.2mm
76842	Plan achromat, Plan P 10x, n.a. 0.25, work. dist. 7.0mm
76844	Plan achromat, Plan P 40x, retractable, n.a. 0.65, work. dist. 0.24mm
76846	Plan achromat, Plan P 100x, oil immersion, retractable, n.a. 1.30, work. dist. 0.12mm

### Metallurgical — For use with Differential "R" or Polarized EPI

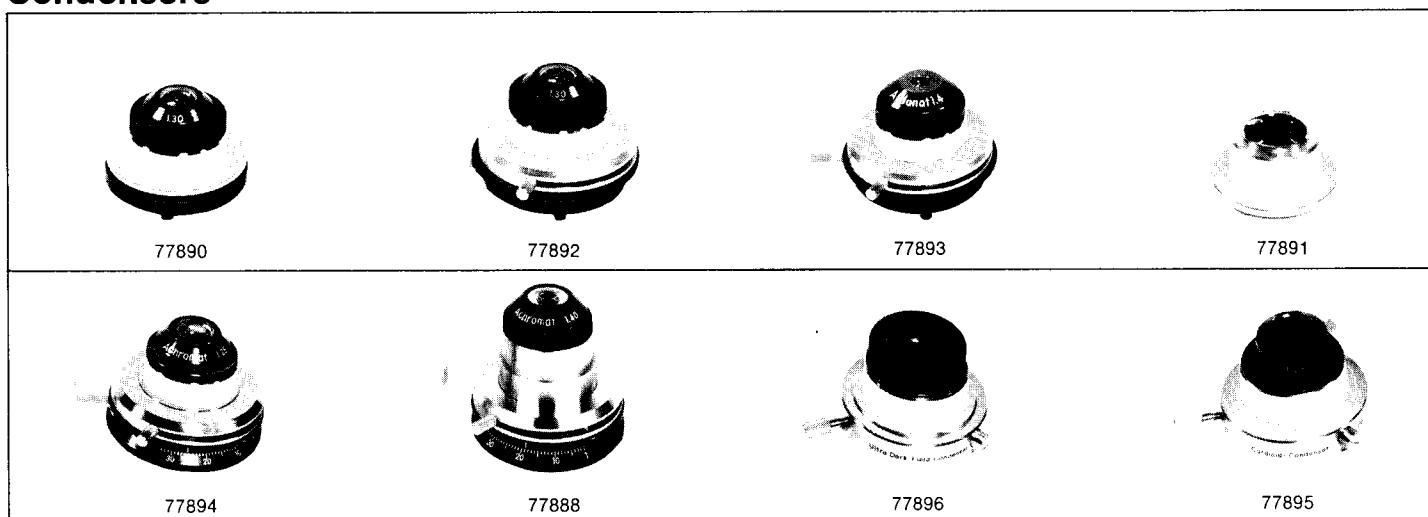
76813	PM 5x strain free Achromat, n.a. 0.10, work. dist. 15.0mm
76814	PM 10x strain free Achromat, n.a. 0.25, work. dist. 7.1mm
76811	PM 20x strain free Achromat, n.a. 0.40, work. dist. 5.7mm
76812	PM 40x strain free Achromat, n.a. 0.65, retractable, work. dist. 0.52mm
76817	PM 100x oil, strain free Achromat, n.a. 1.25, retractable, work. dist. 0.16mm

### Strain Free — Long-Working-Distance

77250	Achromat U 5x, (3.2x) n.a. 0.07, work. dist. 18.8mm
77252	Achromat U 10x, (6.5x) n.a. 0.15, work. dist. 16.4mm
77254	Achromat U 20x, (13x) n.a. 0.21, work. dist. 14.6mm
NOTE:	Above specifications applicable when used <u>without</u> universal stage hemispheres (page 23).



## Condensers



77890	Abbe "N" 2 lens with iris diaphragm and filter holder, n.a. 1.30	77894	Achomat, 5 lens with iris diaphragm, oblique illumination slider and filter holder, n.a. 1.25. Recommended for photomicrography
77892	Abbe, 2 lens with iris diaphragm, oblique illumination slider and filter holder, n.a. 1.30	77888	Achromat/Aplanat, 7 lens with iris diaphragm, oblique illumination slider and filter holder, n.a. 1.40. Most highly corrected; for highest resolution
77893	Aplanat, 3 lens with iris diaphragm, oblique illumination slider and filter holder, n.a. 1.40	77895	Darkfield, cardioid, with centering screws, n.a. 1.20-1.35
77891	Spectacle lens, for use with 1.2x, 2x, & 3x plan low power objectives	77896	Ultra dark field, with centering screws (recommended for fluorescence), n.a. 1.20-1.40

## Functions of Filters

- 1) Daylight blue — simulate daylight and reduce red and infrared rays that cause eye fatigue.
- 2) Diffusing — eliminate bulb filament shadow at low magnification.
- 3) Neutral density — reduce intensity of illumination without affecting color.
- 4) Light balancing — balance color temperature of light for "indoor" type color film.
- 5) Conversion — balance color temperature of light for "daylight" type color film. 820B and 840B for Polacolor.
- 6) Heat absorbing — absorb infrared to keep specimen cool.
- 7) Dark green, 2mm thick — recommended for phase contrast. Dark green, 1mm thick — recommended for interference phase.
- 8) Didymium — enhance red color saturation of eosin and fuchsin stained specimens for color films, especially Kodachrome.
- 9) Color contrast sets — especially useful for biological specimens: green enhances red, yellow enhances violet, orange enhances blue.
- 10) Wratten No. 58 — for high resolution monochrome photography with achromat objectives.

## Filters

### 33mm. Diam. to fit condenser filter retaining ring and swing-out filter holders: S-Cb, S-Kt, S-Ke, L-Ke

76909	Interference, 546nm, high transmission
76910	Light blue, clear, for "Classic"
76914	Daylight, clear blue
76915	Lemon skin diffusing high transmission filter
76918	Neutral density, 10% transmission
76920	Neutral density, 25% transmission
76922	Neutral density, 50% transmission
76924	Light balancing, 82B
76926	Light balancing, 82C
76927	Conversion filter, 80A
76923	Conversion filter, 80B
76925	Conversion filter, 80C
76929	Conversion filter, 820B
76921	Conversion filter, 840B
76928	Heat absorbing
76930	Dark Green, 2mm thick
76931	Dark Green, 1mm thick
76932	Didymium
76934	Diffusing, blue frosted
77133	Contrast filters, set of 3, Green, Yellow, Orange
78654	Wratten No. 58 Green

### 16mm. Diam. to fit Epi illuminator

77242	Daylight, clear blue
77243	Green
77244	Yellow

### 45mm. Diam. to fit Universal Microscope Lamp, Inverted Microscopes M, MS; Apophot, S-Ke, & L-Ke, Kt & CL lamp condensers.

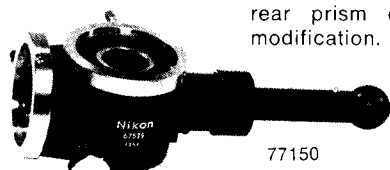
76941	Daylight, clear blue
76935	Lemon skin diffusing, high transmission
76912	Neutral density, 10% transmission
76917	Neutral density, 25% transmission
76919	Neutral density, 50% transmission
76936	Light balancing, 82B
76939	Light balancing, 82C
76942	Conversion filter, 80A
76943	Conversion filter, 80B
76944	Conversion filter, 80C
76946	Conversion filter, 820B
76947	Conversion filter, 840B
76940	Heat absorbing
76937	Dark Green, 2mm thick
76948	Didymium
76945	Wratten No. 58 Green

### Special Fluorescence Filters

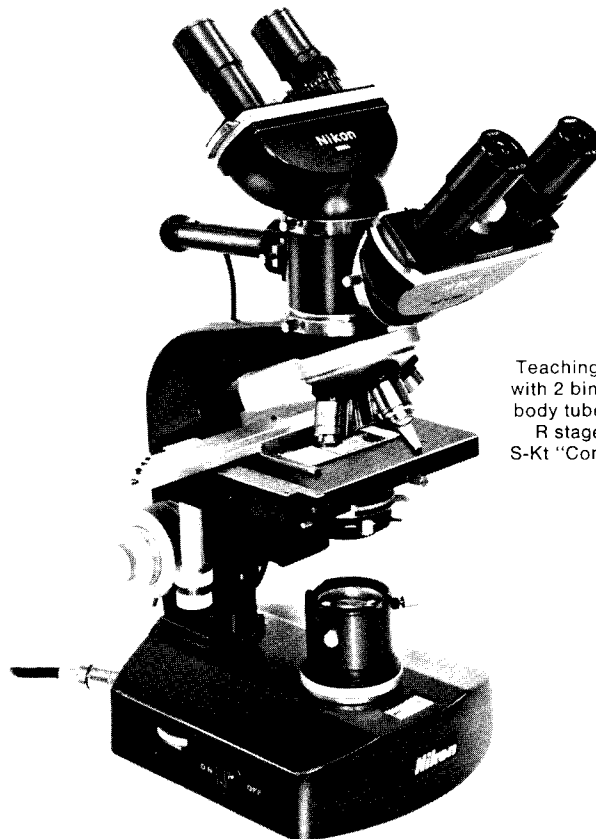
78516	FITC Excitation, 45mm
78517	Barrier, #12 deep yellow, 28mm for use with #78516

## Teaching Head

The teaching head attaches to models L-Ke, S-Ke, S-Kt or S-Cb/D6 or D6QH to permit simultaneous observation by two persons. The moveable arrow pointer is illuminated in white, red or green to maximize contrast with the background. Powered by a separate 115v/3a transformer, the pointer illumination does not dim with the microscope illuminator. Tube magnification factor: 1.25x: May be equipped with any combination of monocular, binocular, or trinocular body tubes. The 30° inclined (Y) Binocular is recommended to keep the configuration at a convenient user height. For trinocular use, the (F) head should be used, as the (U) head's rear prism overhang requires modification.



- 77150 Teaching head with built-in illuminated pointer, green and red filters and transformer; 2 bulbs. Magnification factor 1.25. (requires extra body tube with eyepieces)
- 77155 Replacement Bulb (GE No. 365)
- 77048 Special short phase centering telescope only. For use with Teaching Head when using phase contrast.



Teaching head with 2 binocular body tubes and R stage on S-Kt "Compact"

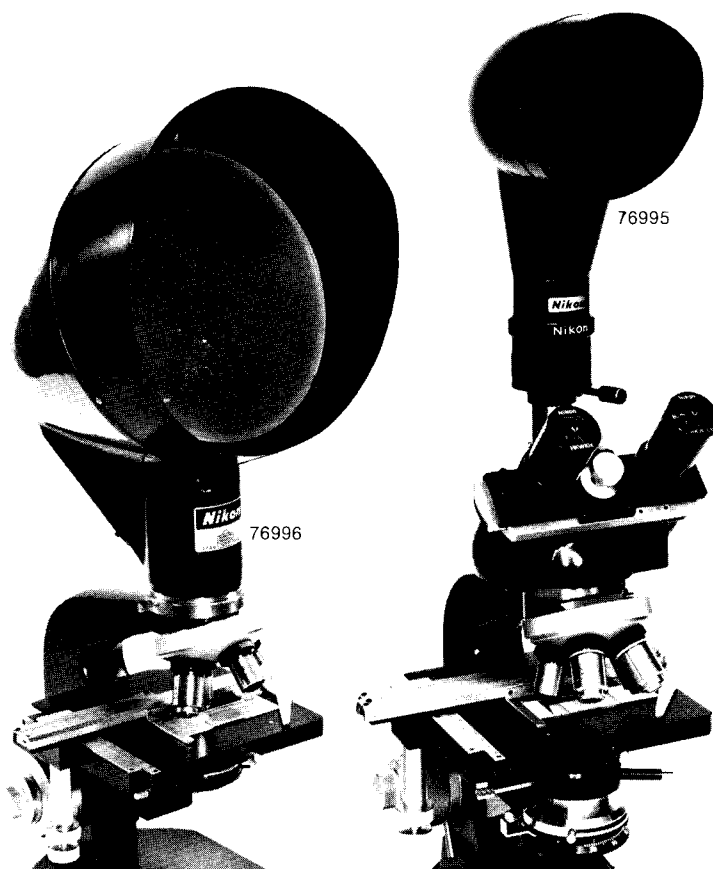
## Projection Head

**Type I** attaches to microscope body in place of a body tube. Equipped with clips to hold tracing sheet. Effective diameter of screen: 170mm. Magnification of projected image — same as observed image of microscope.

**Type II** attaches on top of a vertical monocular tube (V) or trinocular (F) or (U) with standard eyepiece adapter. Effective screen size: 88mm. Magnification of projected image — 2/3x of total magnification of microscope.

Use of Flat-field objectives is recommended to ensure edge sharpness.

- 76996 Projection head Type I in fitted case, 6 3/4" screen (HKW 10x No. 77857 eyepiece required for use)
- 76965 Projection head Type II with 3 1/2" screen (requires 77111)
- 77111 Universal eyepiece adapter (diam. 25mm for 76965)
- 76473 Adapter to mount 76965 Projection Head on Apophot

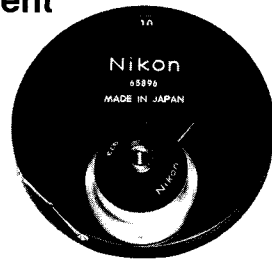


## Differential Interference Attachment

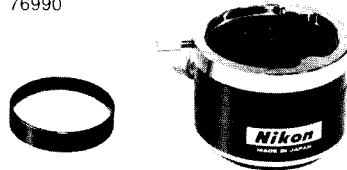
### Type "T"

The Differential Interference "T" attachment is a shearing type transmitted light interference contrast accessory. It displays optical path differences in brilliant interference colors resulting in an image with three dimensional appearance showing minute specimen details.

Applications cover stained subjects as well as living material. The image comes out haloless and more luminous than phase contrast. Since the condenser aperture is fully utilized, the resolution is maintained.



76990



### Type "T"

76990

76804

76806

76810

77781

Differential Interference Attachment, Type T (for transmitted light) consisting of: Compensator unit with 1 each filter analyzer and Savart plate; turret condenser with aperture diaphragm, filter polarizer and 3 Savart plates for 10x, 20x, and 40x objectives

#### Strain Free Achromat Objectives

(Recommended for use with Type T)

P 10x strain free Achromat, n.a. 0.25, work. dist. 7.0mm

P 20x strain free Achromat, n.a. 0.40, work. dist. 5.7mm

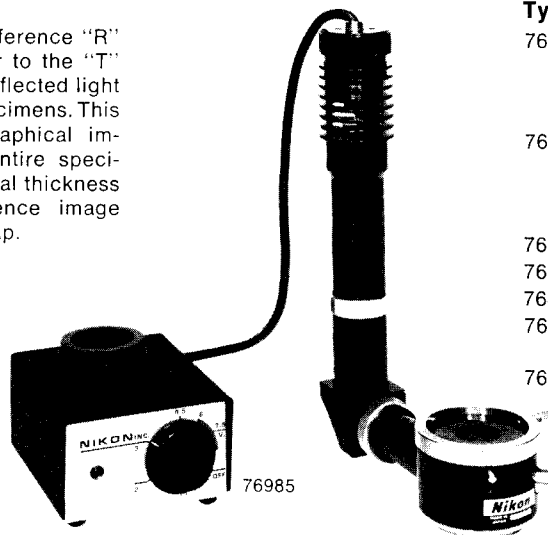
P 40x strain free Achromat retractable, n.a. 0.65, work. dist. 0.54mm

(Recommended for use with Type R & T)

Circular stage, Rotating, Graduated and Centerable (CgC)

### Type "R"

The Differential Interference "R" attachment is similar to the "T" but is designed for reflected light use with opaque specimens. This unit gives a topographical impression over the entire specimen; where the optical thickness varies, the interference image looks like a relief map.



76985

### Type "R"

76985

76984

76813

76814

76811

76812

76817

Differential Interference Attachment Type R (for reflected light) Francon-Yamamoto with 6v/3a transformer Cat. No. 76171 and 2 bulbs No. 77910 to fit S-Cb, S-Kt, S-Ke, and L-Ke bodies

Quartz-Halogen Lamp, 12v/50w for Differential Interference, Type R; with power supply

#### Strain Free Achromat Objectives

(Recommended for use with Type R)

PM 5x Achromat, n.a. 0.10, work. dist. 15.0mm

PM 10x Achromat, n.a. 0.25, work. dist. 7.1mm

PM 20x Achromat, n.a. 0.4, work. dist. 5.7 mm

PM 40x Achromat, retractable, n.a. 0.65, work. dist. 0.52mm

PM 100x Achromat, retractable, oil, n.a. 1.25, work. dist. 0.16mm

### Drawing Attachment, Model II

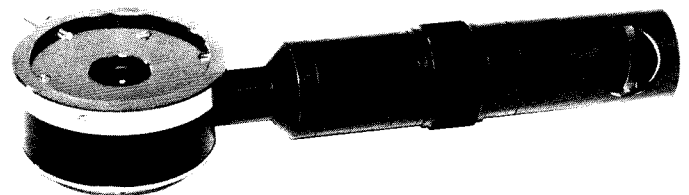
Provides a magnified image of the specimen superimposed upon an erect image of the drawing surface and the pen or pencil. The desired subject details are traced onto the drawing paper. Shallow depth of focus under high magnification can be compensated by focusing at differ-

ent levels and drawing-in the details as they are resolved.

This new model transmits more than twice the light of Model I; this allows drawing with a much weaker light source. The visible drawing area is more than twice as great as with Model I; this enables the user to reproduce finer details with great accuracy.

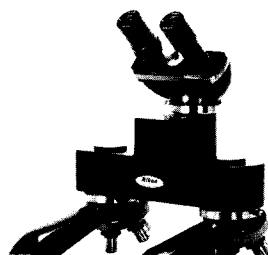
76980

Drawing tube attachment in wooden case, for Models S-Cb, S-Kt, S-Ke, L-Ke, MS



### Comparison Eyepiece Bridge

The images from two matching microscopes can be viewed in a field divided equally between the two in any ratio by means of a sliding prism. Includes a 1:1 relay lens system. Either a binocular or trinocular body tube can be mounted for visual observation and photomicrography.



77763

COMPARISON EYEPIECE BRIDGE, Model 2, with sliding prism and bayonet mount

NOTE: Designed for use with models S-Cb, S-Ke & L-Ke only.

## Phase Contrast Objectives and Accessories

Phase contrast microscopy allows the detailed examination of colorless, unstained specimens that cannot be seen by standard brightfield techniques. It is ideal for viewing living material.

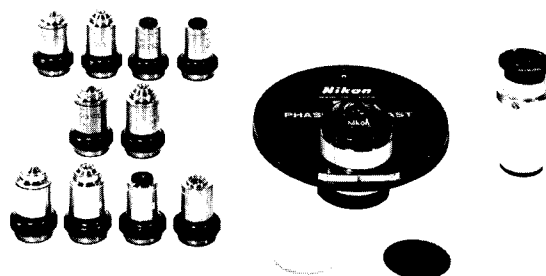
To convert a Nikon brightfield microscope to phase contrast, both the objectives and condenser must be replaced with optics containing the special phase annuli. The same condensers can be utilized with the three types of phase contrast objectives.

a) DLL (Dark — Low — Low) — designed to furnish the strongest dark contrast in ob-

jects having major differences in refractive indices. Subject is dark against light background. The most popular type of phase contrast for examination of cells and other living material; especially suited for photomicrography.

b) DM (Dark — Medium) — designed for high image contrast of specimens with small phase differences, such as fine fibers, granules and particles. Subject is relatively dark against a light background.

c) BM (Bright — Medium) — designed to give contrast similar to darkfield: the subject is light against a dark background. Especially suited for visual examination of bacterial flagelli, protozoa, fibrin fibers, minute globules and blood cell counting.



**The complete sets of objectives listed below are furnished with centering telescope, turret phase condenser, green filter and heat absorbing filter in fitted case.**

Phase contrast sets are arranged for convenience in ordering.

77018	SET TYPE A: Achromat DLL 10x, DLL 20x, DLL 40x and DLL 100x objectives
77019	SET TYPE B: Achromat DLL 10x, DLL 20x, DLL 40x, DLL 100x oil, DM 40x, DM 100x
77045	SET TYPE C: Achromat DLL 10x, DLL 20x, DLL 40x, DLL 100x oil, BM 10x, BM 20x, BM 40x, BM 100x oil
77021	SET TYPE D: Complete set of 10 Achromat objectives (4DLL, 2DM, 4BM)



77035



77040



77049

### Phase Contrast Condensers

77040	Phase Turret Condenser with 10x, 20x, 40x and 100x built-in phase annuli; iris diaphragm for brightfield; heat absorbing and green 33mm filters; phase centering telescope; in fitted case
77049	Long-Working-Distance Phase Turret Condenser (working distance 12-15mm) with 10x, 20x, 40x and 100x built-in phase annuli; iris diaphragm for brightfield; heat absorbing and green 45mm filters, phase centering telescope
77035	Extra-Long-Working-Distance Phase Turret Condenser (40mm working distance) with 10x, 20x, and 40x built-in phase annuli; iris diaphragm for brightfield; heat absorbing and green 45mm filters; phase centering telescope
77041	Phase Centering Telescope only (standard)
77048	Phase Centering Telescope only (short type) for use with Teaching Head or Interference Phase Attachment

### Achromat Phase Objectives

77020	DLL 10x, dark contrast, light, n.a. 0.30, work. dist. 6.40mm
77022	DLL 20x, dark contrast, light, n.a. 0.40, work. dist. 4.50mm
77025	DLL 40x, dark contrast, light, retractable, n.a. 0.65, work. dist. 0.54mm
77027	DLL 100x oil, dark contrast, light, retractable, n.a. 1.25, work. dist. 0.16mm
77029	DM 40x, dark contrast, medium, retractable, n.a. 0.65, work. dist. 0.54mm
77031	DM 100x oil, dark contrast, medium, retractable, n.a. 1.25, work. dist. 0.16mm
77032	BM 10x, bright contrast, medium, n.a. 0.30, work. dist. 6.40mm
77034	BM 20x, bright contrast, medium, n.a. 0.40, work. dist. 4.50mm
77037	BM 40x, bright contrast, medium, retractable, n.a. 0.65, work. dist. 0.54mm
77039	BM 100x oil, bright contrast, medium, retractable, n.a. 1.25, work. dist. 0.16mm

### Long-working-distance phase objective

77809	DML 40x Long-Working-Distance Phase, n.a. 0.60 dark contrast; medium, with correcting collar, work. dist., 2.0mm
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### Flat Field Phase Objectives

77174	Plan Achromat, DLL 40x, dark contrast, light, retractable, n.a. 0.65, work. dist. 0.24mm
77175	Plan Achromat, DLL 100x oil, dark contrast, light, retractable, n.a. 1.30, work. dist. 0.12mm
77178	Plan Achromat, DM 40x, dark contrast, medium, retractable, n.a. 0.65, work. dist. 0.24mm
77179	Plan Achromat, DM 100x oil, dark contrast, medium, retractable, n.a. 1.30, work. dist. 0.12mm
77182	Plan Achromat, BM 40x, bright contrast, medium, retractable, n.a. 0.65, work. dist. 0.24mm
77183	Plan Achromat, BM 100x, oil, bright contrast, medium, retractable, n.a. 1.30, work. dist. 0.12mm

### Apochromat Phase Objectives

77162	Apochromat DLL 40x, dark contrast, light, retractable, n.a. 0.80, work. dist. 0.19mm
77163	Apochromat DLL 100x oil, dark contrast, light, retractable, n.a. 1.40, work. dist. 0.10mm
77166	Apochromat DM 40x, dark contrast, medium, retractable, n.a. 0.80, work. dist. 0.19mm
77167	Apochromat DM 100x oil, dark contrast, medium, retractable, n.a. 1.40, work. dist. 0.10mm
77170	Apochromat BM 40x, bright contrast, medium, retractable, n.a. 0.80, work. dist. 0.19mm
77171	Apochromat BM 100x oil, bright contrast, medium, retractable, n.a. 1.40, work. dist. 0.10mm

## Interference Phase Attachment

A unique form of Nikon microscopy that utilizes polarization to introduce interference colors into phase contrast, enabling the user's eye to distinguish ultrafine details. Must be used with standard achromat objectives.

77000	Includes intermediate piece, short centering telescope, turret phase-interference condenser, green and heat absorbing 33mm filters in fitted case
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## Miscellaneous Accessories

### Micrometers

- 76951 Filar eyepiece micrometer, internal reading, 10x, scale 10mm/.01
- 76952 Micrometer eyepiece, Kellner-type, 10x
- 76954 Stage micrometer A, 1mm/scale length divided in 100 parts
- 76955 Stage micrometer B, 0.2mm/400 squares

### Projection Accessories

- 78162 Projection Mirror Prism Attachment (for use on trinocular S-Ke or L-Ke for short-distance micro-projection with Quartz-Halogen illuminator). Mounting requires universal eyepiece adapter
- 77111 Universal eyepiece adapter
- 78164 3.2x projection eyepiece with adapter collar for projection mirror

### Microscope Cases

- 76974 Fitted Hardwood Cabinet, S-Ke and L-Ke
- 77523 Fitted Hardwood Cabinet, S-Kt and POH-3 monoc
- 77529 Fitted Hardwood Cabinet, S-Cb
- 77410 Plastic case for S-Cb and Classic

### Miscellaneous Accessories

- 76997 Lens cleaning tissue 4" x 6" book, 50 sheets
- 76999 Immersion oil (non drying) in plastic oiler, 8cc. (PCB free)
- 76970 Swing-out filter holder for Su, S-Ke, L-Ke
- 76973 "A" Type filter holder for use with achromat/aplanat condenser
- 77735 Dust cap for nosepiece objective hole (RMS thread)
- 77901 Stage clips, paired (replacement)
- 76960 Eyepiece pointer
- 76968 Polarizing set: filter polarizer and analyzer in fitted case

### Vinyl Dust Covers

- 77900 Type 102 Fits basic binocular and monocular CL Classic; S-Cb/D115; S-Cb/115; S-Cb/D6; S-Cb/D6QH; Kt Compact
- 76972 Type 104 Fits binocular and trinocular S-Ke; L-Ke and POH-3; trinocular S-Kt; all models with teaching head attachments, EPI illuminators, Differential-Interference Type R, or SPO attachment, MSE
- 77332 Type 109 Fits MULTIPHOT and Ke Photoscope on Photo stand types 2 or 3 with Microflex and 1.3x cone
- 76486 Type 107 Fits APOPHOT and MICROPAN
- 76568 Type 103 Fits MS inverted with diascope illuminator
- 78043 Type 108 Fits MS diascope with attached Microflex
- 76501 Type 111 Fits Model M inverted with side mounted photo attachment
- 78508 Type 106 Fits FL-200 and FT-200 fluorescence microscopes

### TV Adapter

- 78122 T.V. Adapter with 90° prism for horizontal use, with C mount collar for T.V. camera, with 1/4x projection lens
- 78123 Adapter to mount T.V. camera on Cine/Photo stand



78123



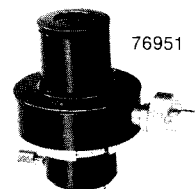
78122



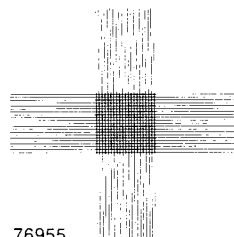
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76952



76951



76955



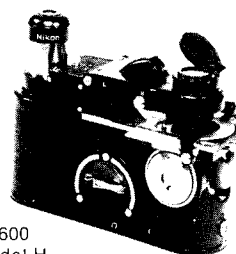
76954

## Model H Portable Microscope

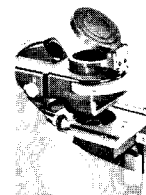
- 76600 Model H Portable Microscope with 4x, 10x, 40x and 100x objectives, powered by 2AA batteries for field use, in leather case
- 76612 Model H-3 for Phase Contrast Microscopy equipped with HK 10x eyepiece, phase achromat objectives, dark-light contrast, DLL 10x, DLL 20x, DLL 40x and DLL 100x (oil), phase turret condenser with annular diaphragm, centering telescope, neck strap and leather case

### Model H Accessories

- 76614 Hole glass slide with cemented cover slip
- 76625 Achromat 20x Objective, Model H
- 76616 Achromat 40x N.C.G. objective for uncovered slides
- 76619 Table clamp with swivel head
- 76620 Transformer for Model H (battery eliminator)
- 76624 Hemacytometer (Blood Counting Chamber) (Thoma type) for Model H specially modified
- 76613 Polarizing set for Model H
- 76617 Illuminator bulb 2.2v penlight (replacement)



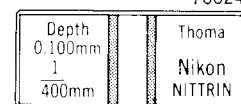
76600  
Model H



76612  
Model H-3



76619



76624

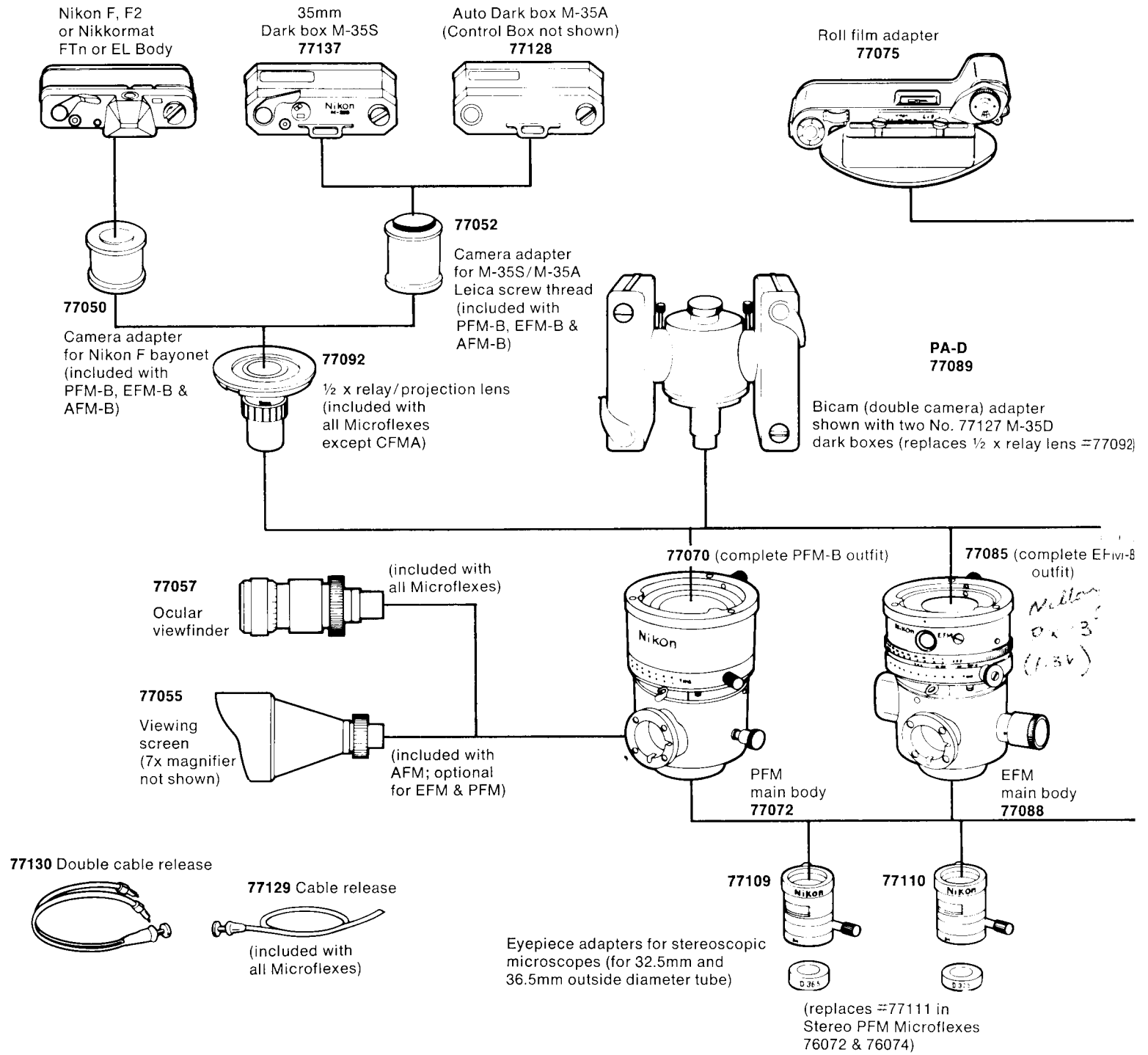


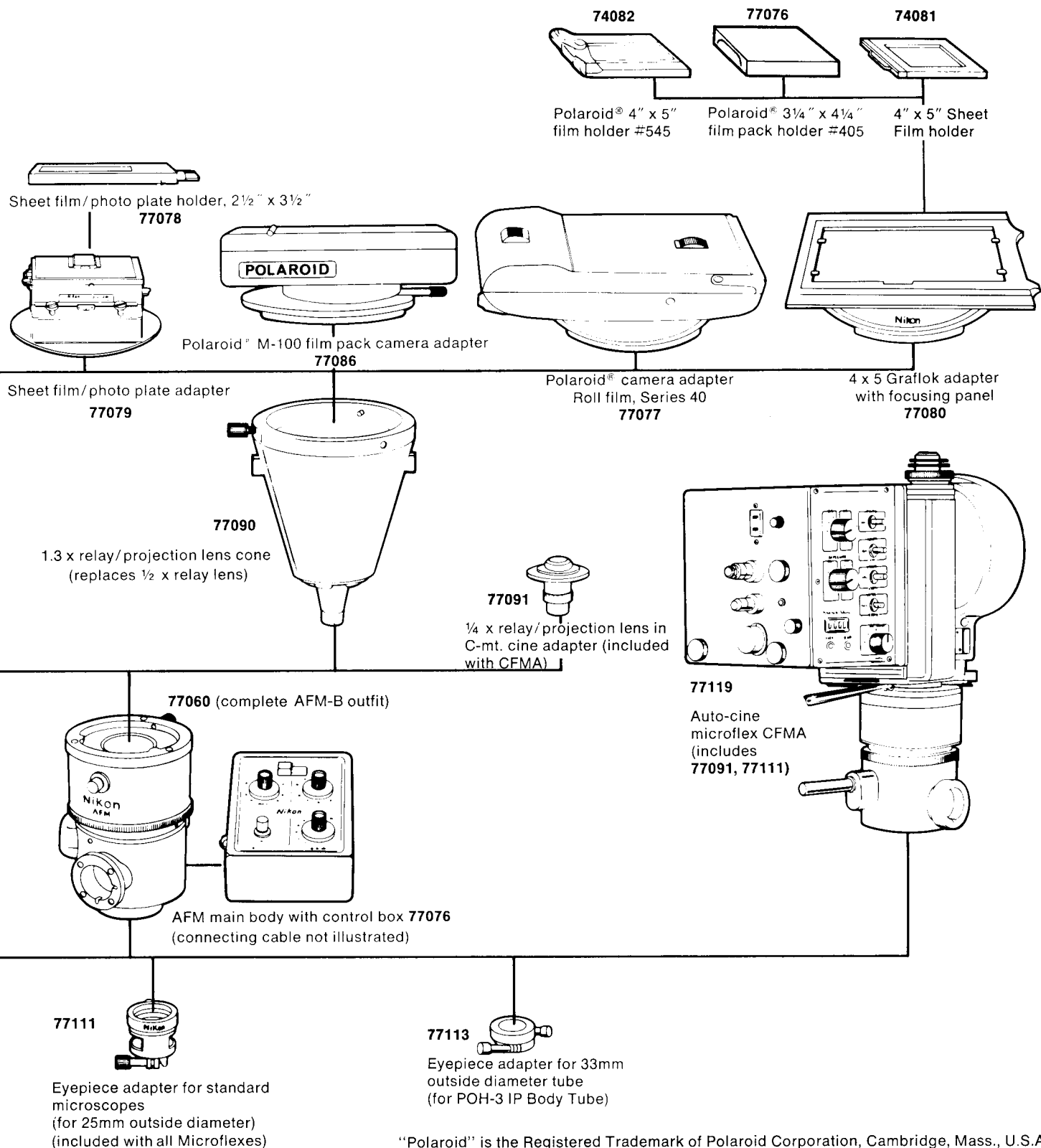
76614

# System of Photo-/Cinemicrographic Equipment

*FNA to FA adapter*

This self-explanatory "family-tree" shows how the basic attachments and accessories combine together and interchange with one another to make a complete system.





# Photomicrographic Equipment

**Model PFM:** A standard prism reflex Microflex attachment with a built-in leaf-type shutter with speeds from 1/250 second to 1 second, plus T and B. Its full-reflecting mirror transmits all the light to the finder for focusing, and swings out of the optical path at the moment of exposure. The model has a built-in X-synchronization contact.

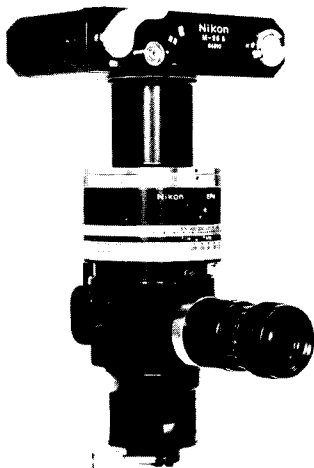


## Standard Microflex PFM

- 77070 Standard Microflex, Model PFM-B consisting of: main body with swingout prism, 1/2 x projection lens, ocular viewfinder, universal eyepiece adapter, cable release and camera adapter for M-35S, (case available as option)
- 77071 Standard Microflex, Model PFM-F, same as above except with Nikon F/Nikkormat camera adapter
- 77081 Plastic carrying case for Microflex

PFM shown with Nikon F2 camera.

**Model EFM:** A semi-automatic Microflex attachment with a built-in match-needle exposure meter. The shutter speed setting is cross-coupled with the meter in the 1/250-1 second range. Exposure reading down to 32 seconds. The meter has a built-in 1.3-volt mercury battery which eliminates the need for a power cord or AC power source.

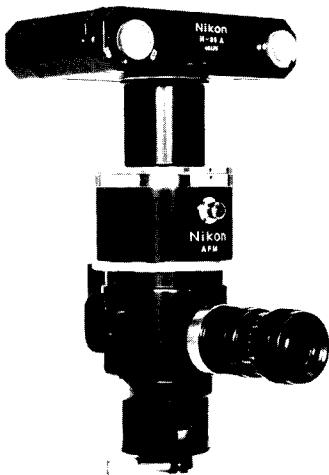


## Semi-Automatic Microflex EFM

- 77085 Semi-automatic Microflex Model EFM-B with built-in CdS exposure meter; consisting of: main body, ocular finder, 1/2 x projection lens, camera adapter for M-35S, universal eyepiece adapter, cable release, in plastic case.
- 77084 Semi-automatic Microflex Model EFM-F, same as above except with Nikon F/Nikkormat camera adapter

EFM shown with M-35S camera back.

**Model AFM:** A fully automatic Microflex attachment with a built-in transistorized shutter that sets correct exposure time automatically. Its sensitive CdS cell measures light levels as low as 10-minute exposure times; it can thus be used for bright- or dark-field microscopy, interference phase, polarizing and fluorescence work.

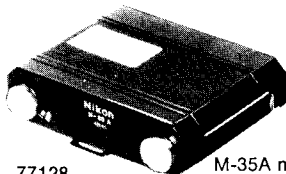


## Automatic Microflex AFM

- 77060 AFM-B Auto-Microflex consisting of: main body, control unit, 1/2 x projection lens, ocular view finder, viewing screen with 7x magnifier, universal eyepiece adapter, cable release and camera adapter for M-35S, in plastic case.
- 77061 AFM-F Auto-Microflex, same as above but with Nikon F/Nikkormat camera adapter
- 77062 A.C. adapter for AFM. Replaces batteries with 115v Transformer.
- 77066 Pilot bulb for AFM body (replacement)
- 77126 M-35A-AFM 6v DC Adapter to power AFM from M-35A power pack

AFM shown with M-35A motorized 35mm camera back. (AFM and M-35A control boxes not illustrated).

## Interchangeable Accessories for PFM, EFM, AFM



77128

M-35A motorized camera back with control box.



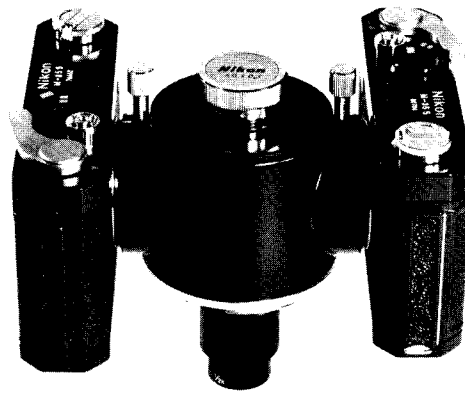
## 35mm Format

- 77050 Camera adapter only for Nikon F/Nikkormat (replacement)
- 77052 Camera adapter only for M-35S camera back (replacement) thread mount
- 77092 1/2 x projection lens (replacement)
- 77137 Camera Back M-35S with full 35mm and 1/2 frame capability
- 77128 M-35A Motorized Camera Back for full-frame 35mm; automatic film advance, with control box



### 35mm Format (Continued)

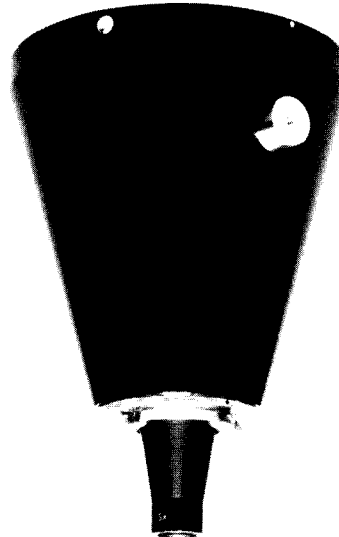
- 77089 "BICAM" Double head camera adapter (permits the mounting of 2 each M-35D camera backs for color and black and white) with built-in  $\frac{1}{2}x$  projection lens, fitted case; complete, less cameras (a unique Nikon accessory)
- 77127 M-35D Camera Back similar to M-35S, but especially for use with "BICAM" Head



"Bicam" with  
2 #77127 M-35D  
camera backs  
77089

### Large Format Photography

- ▲ 77090 **Camera cone with built-in 1.3x projection lens (required for the following accessories)**
- 77086 (M-100) camera adapter Polaroid  $3\frac{1}{4}'' \times 4\frac{1}{4}''$  Film Pack
- 77077 Polaroid roll film camera adapter for series 40,  $3\frac{1}{4}'' \times 4\frac{1}{4}''$
- 77075 Roll film adapter (6cm x 9cm) No. 120 film
- 77078 Cut film adapter  $2\frac{1}{2}'' \times 3\frac{1}{2}''$
- 77079 Set of 6 cut film plate holders ( $2\frac{1}{2}'' \times 3\frac{1}{2}''$ )
- ▲ 77080 **Graflok**  $4'' \times 5''$  adapter (requires 77090 cone)
- ▲ 74081  $4'' \times 5''$  Sheet film holder for Graflok back
- ▲ 74082  $4'' \times 5''$  Polaroid 545 holder for  $4'' \times 5''$  Polaroid sheet film
- ▲ 77076 #405 Polaroid  $3\frac{1}{4}'' \times 4\frac{1}{4}''$  Film Pack adapter for Graflok back



Camera Cone  
77090

▲ These items comprise the most versatile combination for large format photomicrography.  $3\frac{1}{4}'' \times 4\frac{1}{4}''$  film pack and  $4'' \times 5''$  Polaroid film may be used, in addition to  $4'' \times 5''$  sheet film, such as the new Kodak 2483 color photomicrography film.

**NOTE:** The above listed backs may also be used on the Multiphot photomacrographic stand, but require #77319 ring adapter.

### General Accessories For Photomicrography

- 77055 Viewing screen with hood and 7x magnifier (supplied with AFM, but can be ordered as accessory for PFM and EFM—For low power photomicrography)
- 77057 Ocular viewfinder (furnished with all Microflexes.)
- 77111 Microflex eyepiece adapter — Universal (diam. 25mm)
- 77109 Microflex eyepiece adapter — for Models SMZ and SM5 Stereo microscopes (diam. 36.5mm)
- 77110 Microflex eyepiece adapter — for Model SM stereo microscope (diam. 32.5mm)
- 77113 Microflex eyepiece adapter — for Model POH polarizing microscope with IP monoc body tube (diam. 33mm)
- 77124 Camera adapter to convert Leica type screw to Leica "M" bayonet mount (suggested for use with PFM only.)
- 77129 Single cable release for Microflex and M-35S (replacement)
- 77130 Double cable release for Microflex and M-35S
- 77054 **Air bulb release** (replaces cable for extra smooth shutter release)
- 77140 S & M Photometer with eyepiece body tube adapter (for 23.5mm I.D.)
- 76551 **Photo stand** type 3 (recommended for extra stability, especially when #77090 cone is used with large format backs)
- 76537 Vertical T.V. adapter with C mount for Photo stand

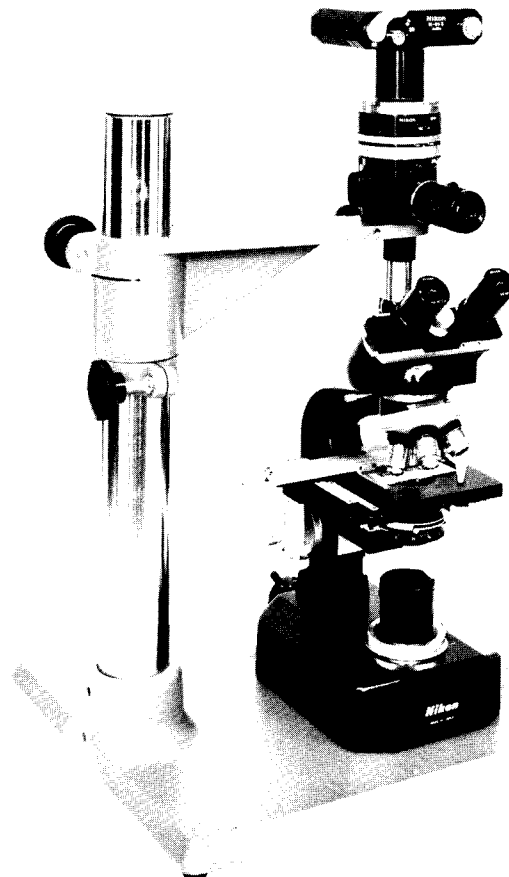


Photo Stand,  
Type 3  
76551

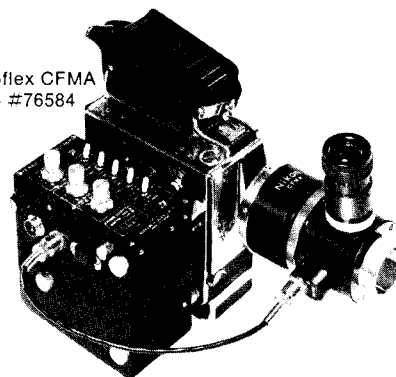
## Cinemicrographic Equipment

The unique Nikon Model CFMA employs an intervalometer, motor drive, and automatic exposure control to provide fully automatic continuous time-lapse cinemicrography with the Bolex H-16 cine camera. Continuous shooting is possible at up to 200 frames per minute. When used on an upright microscope, the #76551 photo-stand accessory is available to reduce the effects of environmental vibration. Automatic exposure settings from 1/5 second to 15 seconds. Film ASA settings 12 to 400. Standard exposure times: 1/4, 1/2, 1, 2, 4, and 8 seconds. Continuous or shutter-synchronized film advance and a 1/4x relay projection lens and a frame counter are other features that lend themselves ideally to cinemicrography of tissue culture specimens, isolated unicellular organisms, crystal formation as well as such analogous time-lapse applications as observing slow changes in microorganisms.

### Auto Cine-Microflex CFMA

- 77119 Automatic cinemicrographic attachment Model CFMA: consisting of main body with built-in photometer, ocular finder, universal eyepiece adapter, 1/4 x projection lens and control box (price does not include camera)
- 76584 Bolex H-16 M5 Camera, less lens
- 76585 Bolex H-16-J Camera, less lens (industrial model)
- 76543 Adjustable base for Bolex used with CFMA on Model M
- 76471 Cine bracket for Apophot and Multiphot support rail

77119  
Auto-Cine Microflex CFMA  
on Bolex H-16 #76584



76543  
Adjustable Base



## Functions of Filters

- 1) Daylight blue — simulate daylight and reduce red and infrared rays that cause eye fatigue.
- 2) Diffusing — eliminate bulb filament shadow at low magnification.
- 3) Neutral density — reduce intensity of illumination without effecting color.
- 4) Light balancing — balance color temperature of light for "indoor" type color film.
- 5) Conversion — balance color temperature of light for "daylight" type color film. 820B and 840B for Polacolor.

- 6) Heat absorbing — absorb infrared to keep specimen cool.
- 7) Dark green, 2mm thick — recommended for phase contrast. Dark green, 1mm thick — recommended for interference phase.
- 8) Didymium — enhance red color saturation of eosin and fuchsin stained specimens for color films, especially Kodachrome.
- 9) Color contrast sets — especially useful for biological specimens: green enhances red, yellow enhances violet, orange enhances blue.
- 10) Wratten No. 58 — for high resolution monochrome photography with achromat objectives.

## Filters

### 33mm. Diam. to fit condenser filter retaining ring and swing-out filter holders: S-Cb, S-Kt, S-Ke, L-Ke

- 76909 Interference 546 nm, high transmission
- 76910 Light blue, clear, for "classic"
- 76914 Daylight, clear blue
- 76915 Lemon skin diffusing high transmission filter
- 76918 Neutral density, 10% transmission
- 76920 Neutral density, 25% transmission
- 76922 Neutral density, 50% transmission
- 76924 Light balancing, 82B
- 76926 Light balancing, 82C
- 76927 Conversion filter, 80A
- 76923 Conversion filter, 80B
- 76925 Conversion filter, 80C
- 76929 Conversion filter, 820B
- 76921 Conversion filter, 840B
- 76928 Heat absorbing
- 76930 Dark Green, 2mm thick
- 76931 Dark Green, 1mm thick
- 76932 Didymium
- 76934 Diffusing, blue frosted
- 77133 Contrast filters, set of 3, Green, Yellow, Orange
- 78654 Wratten No. 58 Green

### 16mm Diam. to fit EPI Illuminator

- 77242 Daylight, clear blue
- 77243 Green
- 77244 Yellow

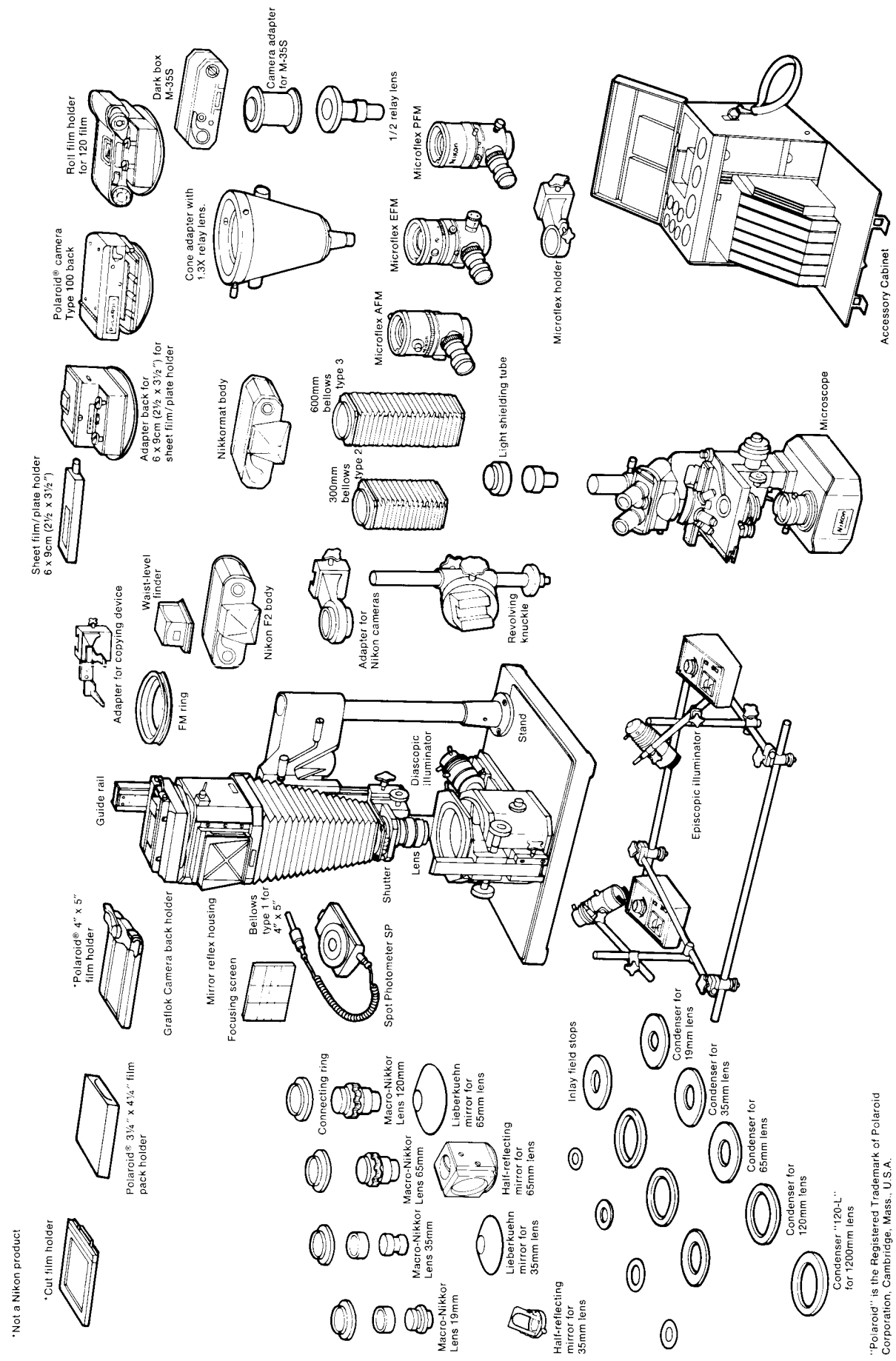
### 45mm. Diam. to fit Universal Microscope Lamp, Inverted Microscopes M, MS; Apophot, S-Ke & L-Ke, Kt & CL lamp condensers.

- 76941 Daylight, clear blue
- 76935 Lemon skin diffusing, high transmission
- 76912 Neutral density, 10% transmission
- 76917 Neutral density, 25% transmission
- 76919 Neutral density, 50% transmission
- 76936 Light balancing, 82B
- 76939 Light balancing, 82C
- 76942 Conversion filter, 80A
- 76943 Conversion filter, 80B
- 76944 Conversion filter, 80C
- 76946 Conversion filter, 820B
- 76947 Conversion filter, 840B
- 76940 Heat absorbing
- 76937 Dark green, 2mm thick
- 76948 Didymium
- 76945 Wratten No. 58 Green

### Special Fluorescence Filters

- 78516 FITC Excitation, 45mm
- 78517 Barrier, #12 deep yellow, 28mm for use with #78516

# Multiphot Universal Photographic System



\*Polaroid® is the Registered Trademark of Polaroid Corporation, Cambridge, Mass., U.S.A.

## Multiphot Universal Photographic Stand

The MULTIPHOT is an extremely versatile camera with a full range of components and accessories that enables it to span the gap between the magnification ranges covered by close-up cameras and the microscope. Both 4 x 5 and 35mm formats and Polaroid are included in the system; the magnification range is from 1/3x to 40x.

The MULTIPHOT stand, with its double support columns and "H" rail mounting for bellows, is rock-steady. A revolving knuckle joint permits the entire camera assembly to revolve a full 90° in either direction.

For transmitted light photomicrography, the MULTIPHOT utilizes a superbly designed diascopic transilluminating base assembly with a low voltage lamp for extremely even homogeneous illumination of transparent specimens. Built-in mirror

rotation also permits oblique and dark-field illumination. The matched focal length condenser lenses utilize a unique double lens system. The condensers match the 4 Macro Nikkor lenses designed especially for the MULTIPHOT.

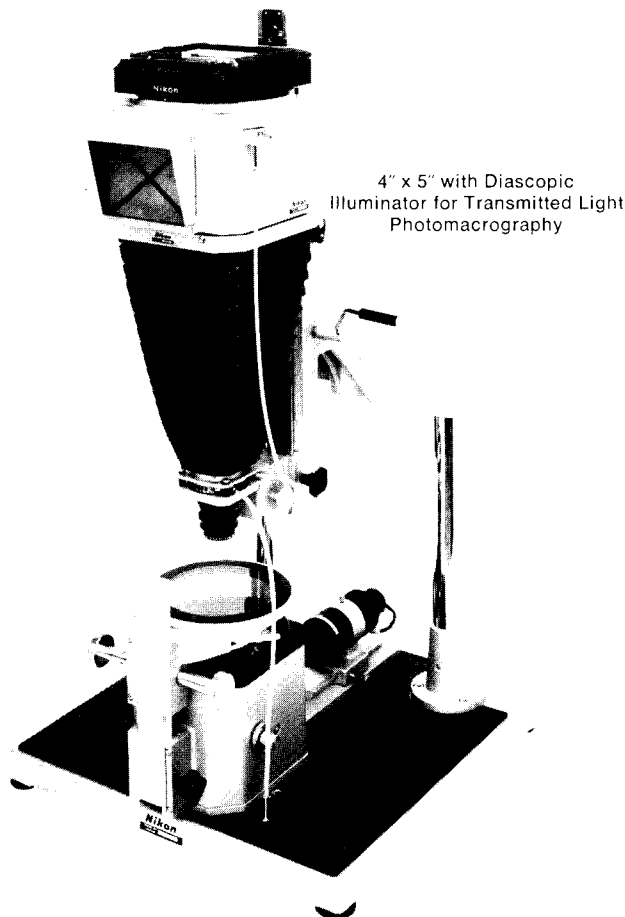
The Macro Nikkor lenses have built-in iris diaphragms to control contrast and depth of focus for reflected light photomicrography.

The MULTIPHOT is designed as a part of the Nikon System; an adapter is available for Nikon F, F2 and Nikkormat camera bodies. With Nikon lenses, such as the 55mm Auto Micro Nikkor, the MULTIPHOT becomes a rock-steady photocopying stand.

**NOTE:** Often, inferior photographs are traceable to the influence of environmental vibrations. In such cases, please inquire about the EPOI Vibration Isolation Systems.

- 77300 Multiphot stand including large base plate with anti-vibration pad, guide rail on dual column adjustable in height by rack and pinion
- 77302 Camera Bellows 4" x 5" with bracket and mount
- 77304 Self-cocking shutter, 1 sec. to 1/125 and bulb, anti-vibration mounted with fine focus drive on bracket
- 77306 Mirror Reflex Housing with two interchangeable focusing screens and cable release to open shutter while focusing; 7x focusing magnifier
- 77305 Coupling Long Cable Release: mirror reflex housing to shutter (replacement)
- 77308 4" x 5" Graflok Back for use with film holders on p. 31: Nos. 74081, 74082, 77076
- 77345 Macro-Nikkor Lens, 19mm f/2.8, with 77316 & 77318 adapters
- 77346 Macro-Nikkor Lens, 35mm f/4.5, with 77316 & 77318 adapters
- 77347 Macro-Nikkor Lens, 65mm f/4.5, with 77316 adapter
- 77348 Macro-Nikkor Lens, 120mm f/6.3, with 77316 adapter
- 77316 Adapter to fit Macro-Nikkors to shutter bracket
- 77318 Adapter to fit microscope objectives (RMS thread) to No. 77316 adapter
- 77330 Direct reading spot Exposure Meter
- 77322 Revolving Knuckle Joint with post, allows rotation of camera assembly
- 77319 Ring Adapter for mounting No. 77075, 77077, 77078 and 77086 camera attachments to mirror reflex housing (see page 31)
- 77331 Filter, 50mm square, green
- 77333 Filter, 50mm square, 1/8 neutral density
- 77343 Half reflecting mirror for 35mm Macro-Nikkor
- 77344 Half reflecting mirror for 65mm Macro-Nikkor
- 77315 Wooden Fitted Accessory Cabinet for Multiphot Bellows, lenses, condensers, etc.
- 77637 Fiber Optic Quartz-Halogen 150w illuminator with power supply and mounting bracket assembly
- 77645 Telescoping Table Stand for #77637 illuminator
- 77914 Universal Microscope Lamp, 6v/30w, with iris diaphragm, continuously variable transformer with voltmeter, 2 bulbs (#77904)

**NOTE:** For additional available camera backs see pages 28 to 31.



### Accessories for Transmitted Light Photomicrography

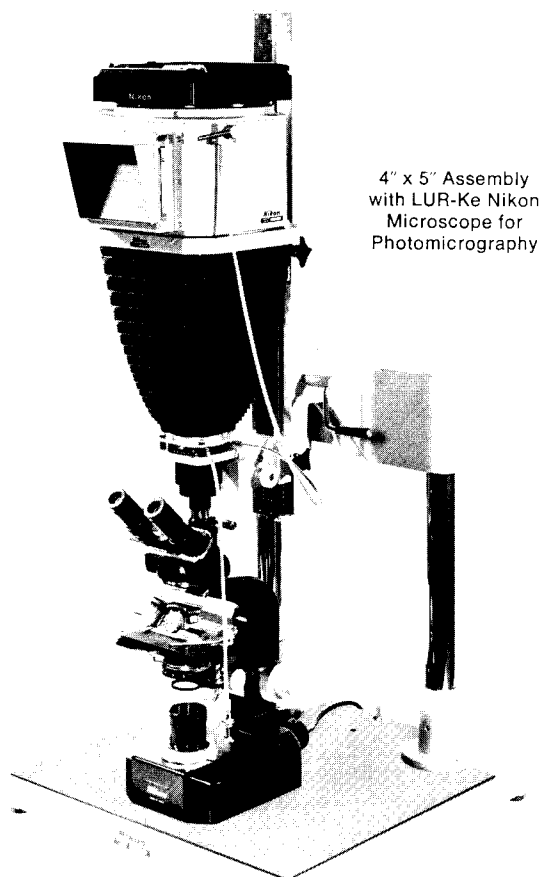
- 77320 Diascopic illumination assembly with variable field diaphragm, supplementary condenser and 6v/30w lamp with 2 bulbs No. 77904 and transformer with meter
- 77321 Inlay ring field diaphragms (set of 8) drilled and tapped for microscope mechanical stage
- 77784 Attachable mechanical stage, top control, 66mm x 28mm travel for 1 x 3 microscope slides. For use on #77321
- 77323 Condenser lens, 19mm
- 77324 Condenser lens, 35mm
- 77326 Condenser lens, 65mm
- 77328 Condenser lens, 120mm
- 77311 Lieberkuehn Mirror, matte surfaced, for 35mm Macro-Nikkor
- 77313 Lieberkuehn Mirror, matte surfaced, for 65mm Macro-Nikkor

**NOTE:** Above condensers should be ordered with Macro-Nikkor lenses of corresponding focal length.

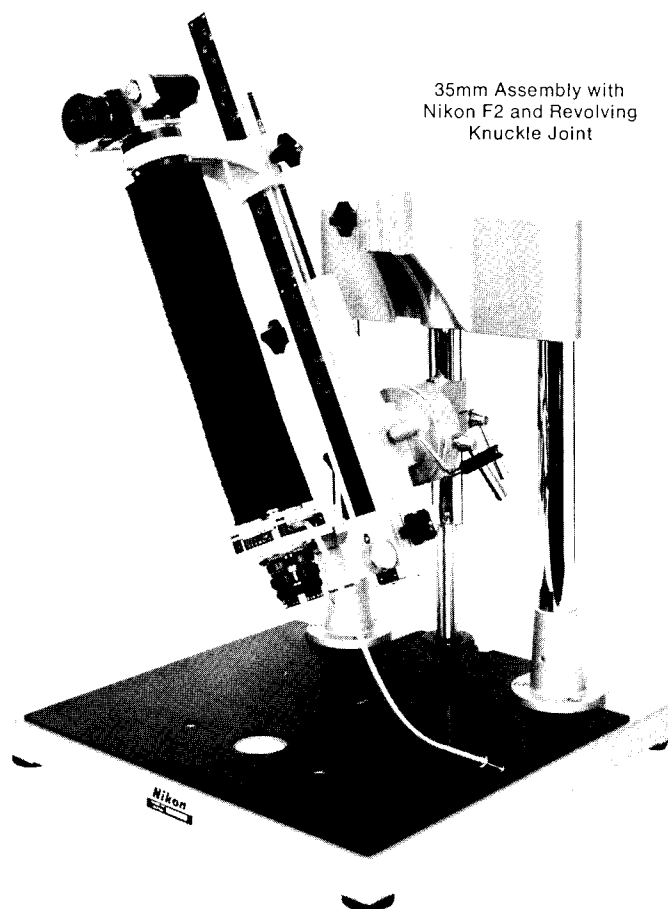
### Accessories for 35mm.

#### Photomicrography and Photomicroscopy

- 77334 Narrow Bellows, type 2 (short)
- 77336 Narrow Bellows, type 3 (long)
- 77329 120L Condenser lens for 1/3x to 2x magnification for use with 35mm camera on diascopic illumination base
- 77338 F Bracket for mounting Nikon F camera body and narrow bellows
- 77340 FM Bracket for mounting Microflexes
- 77341 Photocopying adapter for Nikon F2, or Nikkormat
- 77342 Light excluding collar for coupling to microscope
- 76471 Cine bracket for support rail
- 76472 Microflex cone bracket for support rail



4" x 5" Assembly  
with LUR-Ke Nikon  
Microscope for  
Photomicrography



35mm Assembly with  
Nikon F2 and Revolving  
Knuckle Joint

**Suggested Multiphot Configuration for Large-Format Transmitted Light Photomicrography (full 1x to 40x magnification range):**

77300	Multiphot stand
77302	4" x 5" camera bellows
77304	Shutter, self-cocking leaf type, in bracket
77306	Mirror reflex housing
77308	4" x 5" Grafflok back
74082	Polaroid 545 holder, 4" x 5"
77345	19mm Macro-Nikkor lens w/adapters
77346	35mm Macro-Nikkor lens w/adapters
77347	65mm Macro-Nikkor lens w/adapters
77348	120mm Macro-Nikkor lens w/adapters
77320	Diascopic illumination assembly
77323	19mm condenser lens
77324	35mm condenser lens
77326	65mm condenser lens
77328	120mm condenser lens
77321	Inlay diaphragm ring set (8), drilled and tapped for mechanical stage
77784	Mechanical Stage for 77321
77311	35mm Lieberkuehn mirror (for opaque specimens)
77313	65mm Lieberkuehn mirror (for opaque specimens)
77331	Green filter, 50mm square
77333	1/8 neutral density filter, 50mm square
77330	Exposure meter, spot type, direct reading
77315	Wooden fitted accessory cabinet

**Suggested Multiphot Configuration for 35mm Reflected Light Photomicrography (full 1/3x to 40x magnification range):**

77300	Multiphot stand
77322	Revolving knuckle joint
77338	"F" bracket to mount camera
1600	Nikon F2 camera body (chrome)
2317	Nikon 6x focusing viewfinder for F2
2333	"C" focusing screen for F2
77334	35mm bellows, type 2 (short)
77336	35mm bellows, type 3 (long)
77304	Shutter, self-cocking leaf type, in bracket
77345	19mm Macro-Nikkor lens, with adapters
77346	35mm Macro-Nikkor lens, with adapters
77347	65mm Macro-Nikkor lens, with adapter
77348	120mm Macro-Nikkor lens, with adapter
77343	35mm half-reflecting mirror
77344	65mm half-reflecting mirror
77330	Exposure meter, spot type, direct reading
77315	Wooden fitted accessory cabinet
77914	Universal microscope lamp, 6v/30w, with metered transformer. (Two required for dual side lighting)
<b>or</b>	
77637	Fiber optic illuminator (150 watt quartz-halogen). (Two required for dual side lighting)
77645	Telescoping stand for fiber optic illuminator. (Two required for dual side lighting)

**Optional Copy Equipment**

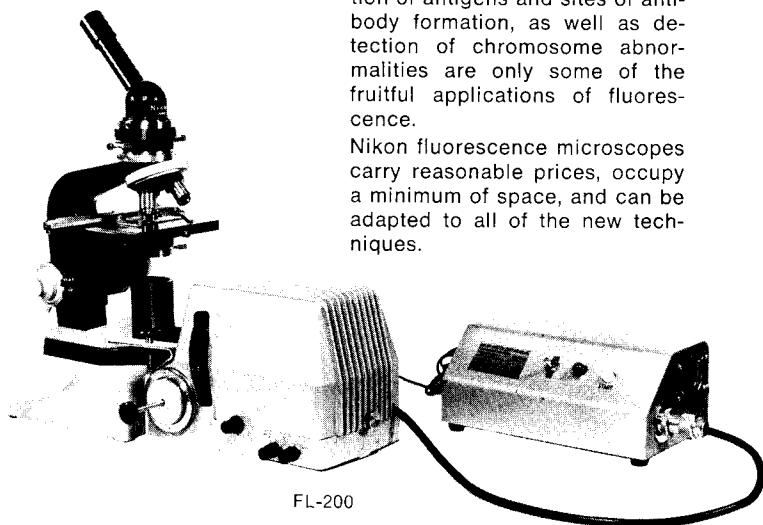
77341	Photocopying adapter bracket for Nikon F2
62	F2 Photomic exposure meter/viewfinder for through-the-lens metering
924	55mm Auto-Micro-Nikkor f/3.5 lens for F2



## Nikon High Intensity Fluorescence Systems

The use of fluorescence microscopes in medical and biological research is growing daily. Diagnosis of disease-causing bacteria, protozoa and viruses, detection of antigens and sites of antibody formation, as well as detection of chromosome abnormalities are only some of the fruitful applications of fluorescence.

Nikon fluorescence microscopes carry reasonable prices, occupy a minimum of space, and can be adapted to all of the new techniques.



FL-200



FT-200

### FL-200

78506

**FLUORESCENCE ILLUMINATOR, FL 200 (HIF)** consisting of: Lamp housing with cooling fan and base for microscope; centering and focusing controls for mercury burner; Arc centering accessory; light path change over knob; Light shielding tube; Two filter turrets with 8 interchangeable exciter filters; Arm rests; High pressure 200 watt mercury burner; 115v A.C. Power Supply with starter; Intermediate attachment with barrier filter slider and turret including 6 filters; Tungsten Illuminator, 6v/30w with 1 red and 1 green filter, continuously variable transformer with 2#77904 bulbs; Turret aplanat condenser, n.a. 1.4 with focusing telescope and 4 fluorescence/phase annular diaphragms in fitted case for combined phase-fluorescence studies

#### Accessories for FL-200

78521

**SIR-F Microscope for FL-200** equipped for fluorescence microscopy with the following: Inclined monocular tube, HKW-10x eyepieces, RS spiral-grooved mechanical stage, achromat objectives: 10x, 20x, 40x retractable, 100x (oil) with iris

77747

Monocular-Monocular (A) photo head No. 77747 can be *substituted* for inclined monocular (I) body tube at additional cost.

77896

Ultra Darkfield Condenser

### FT-200

78520

**BASIC FLUORESCENCE ILLUMINATOR, FT-200**, consisting of: Lamp housing with base for microscope; centering and focusing controls for mercury burner, arc centering accessory; Filter box containing excitation filters, interchangeable by push-pull rods; 1 UV and 2 BV excitation filters; 1 UV absorption and 1 BV absorption eyepiece barrier filters; High pressure 200 watt mercury burner; 115v A.C. Power Supply with starter attached **SIR-F Microscope** equipped for fluorescence microscopy with the following: Inclined monocular tube, HKW-10x eyepiece, RS spiral-grooved mechanical stage, achromat objectives: 10x, 20x, 40x retractable, 100x (oil) with iris (requires #77896 Condenser)

77896

Ultra Darkfield Condenser

NOTE:

Model FT-200 does not have provision for tungsten illuminator or exciter filter turret as does the FL 200.

#### Special Phase Objectives for FL-200 Combined Phase Fluorescence

78540

DLL-F 10x Achromat, n.a. 0.25, work. dist. 7.10mm

78541

DM-F 100x oil, Achromat with iris diaphragm, n.a. 1.25, work. dist. 2.0mm

#### Accessories for Both FT-200 and FL-200

77896

Ultra Dark Field Condenser, n.a. 1.20-1.40 with centering screws (Required for FT-200 optional for FL-200)

78575

Intermediate attachment with filter slider and turret including 6 barrier filters

78590

High pressure mercury burner 200w (replacement)

78513

Fluorescence Test Slide

78583

Comparison photometer for preparatory measurement of UV radiation intensity. Consisting of: meter with CdS sensor on coil cord; special eyepiece; check plate with 4 pin holes for different magnifications

#### Suggested Fluorescence System for Antigen Antibody Technique

78520

Basic FT-200 illuminator with SIR-F Microscope

77896

Ultra Darkfield Condenser

78590

Spare Burner

#### Suggested Fluorescence System for combined Fluorescence Phase studies as well as Antigen Antibody Technique

78500

FL-200

78521

SIR-F Microscope

77896

Ultra Dark Field Condenser

78590

Spare High Pressure Burner

Both systems are also provided with exciter and barrier filters for blue-green fluorescence such as for acridine orange method.

The NIKON High Intensity Fluorescence systems will accept a wide variety of additional accessories, including photomicrographic and cinemicrographic attachments. See listings pages 28 to 32.

## Low Voltage Fluorescence

The new FITC technique (fluorescence isothio cyanate) has been made possible by the development of high transmission interference filters and the so-called ultra-darkfield condensers. The FITC technique has expanded the use of fluorescence microscopes by making possible a compact instrument at much lower cost through use of the simple tungsten-halogen (quartz-iodine) low-voltage illuminator instead of the mercury vapor arc burner. This light source is also ideal for normal brightfield and phase contrast microscopy, mak-

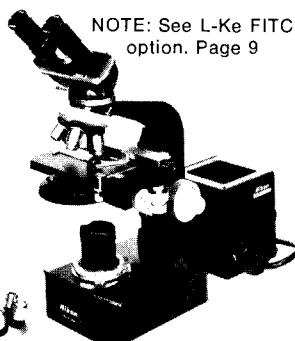
ing possible new economical multi-purpose microscopes with the single illuminator.

76726

78516

78517

Quartz-halogen illuminator, 12v/100w; for S-Ke and L-Ke; power supply; 76513 bulb  
FITC excitation filter, 45mm  
FITC barrier filter, #12 deep yellow, 28mm (for use with 78516)



NOTE: See L-Ke FITC option. Page 9

## Micropan Microprojector

The Nikon MICROPAN is an advanced microprojector that combines maximum image brightness with superb resolution and unprecedented ease of operation. It utilizes a 450w Xenon-arc ozone-free burner and a special optical system capable of projecting microscopic specimens with critical sharpness at auditorium distances. Its special heat filtration system virtually eliminates the slide bleaching and melting that has historically been the drawback of such intense illumination sources.

All of the MICROPAN's operating controls face the operator for easy accessibility. A single large rotating knob simultaneously changes the objective turret and its gear-coupled condenser turret. Flat-field 1.2x, 4x, 10x, fluo-rite 40x, and 100x oil objectives and a matched condenser for

each are standard. An electroluminescent panel lights-up to display the objective in use. All lamp alignments and adjustments are accomplished by only three knobs facing the projectionist.

The MICROPAN zoom projection eyepiece is specially designed to match the image size to the screen at varying projection distances. It contains three built-in reticles: an arrow pointer, a micrometer scale, a center circle.

This center circle, when projecting with the 10x objective encloses the area of the specimen that will comprise the entire field of view with the 40x objective.

For critical projection when intra-cellular detail and brightness is required, such as blood or bone marrow smear haematology, a fixed-focus 3.2x projection eyepiece is available to

provide maximum definition. The MICROPAN is normally supplied with a coaxially controlled rectangular mechanical stage. An optional round stage with joystick control is also available. The 115v A.C. power supply has an adjustable range of 13a to 30a. Power supply and lamp can

be instantly re-started with no "cooling-down" time required. Average lamp life is 600 to 1,000 hours.

A special rigid all-metal rolling projection table with locking casters, utility shelf, and hooks for cord storage is a basic accessory.



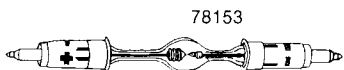
78157  
Zoom Eyepiece  
with 78102  
Projection Mirror



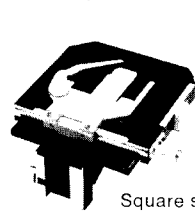
78164  
3.2X  
Eyepiece  
with Mirror  
Prism Collar



Eyepiece holder  
#78158



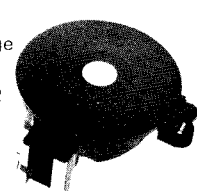
78153  
450 Watt Xenon-Arc Burner



Square stage  
78156

Gliding Stage

78152



78150

MICROPAN Zoom Microprojector including: Main body with 2.5x-5x zoom projection lens head with built-in pointer, micrometer and central circle reticles; 5 flat field objectives including 1.2x, 4x, 10x and 100x plan achromats and 40x plan fluorite, each with coupled matching condenser; rectangular mechanical stage, graduated, with coaxial controls; power supply; 450w Xenon Arc ozone-free lamp; dust cover, complete with safety goggles for lamp replacement

78160

MICROPAN Microprojector as above, less zoom projection lens head, but with eyepiece holder and 3.2x projection eyepiece

78151

Projection table on wheels for microprojector and power supply

78153

450W Xenon Arc ozone-free lamp (replacement)

NOTE: The following projection heads and stages may be interchanged on either model.

78157

Zoom Eyepiece with 2.5x-5x magnification range; built-in pointer, micrometer and central circle reticles

78164

3.2x Projection Eyepiece with collar to mount projection mirror (Requires 78158 holder)

78158

Projection Eyepiece Holder

78156

Rectangular Mechanical Stage, graduated with coaxially controlled X (75mm) and Y (25mm) travel

78152

Circular Gliding Stage with joystick control

78162

Projection Mirror Attachment for 78157 and 78158

## Nikon Stereoscopic Microscopes

"Compound" microscopes, whether equipped with monocular or binocular viewing tubes, have only one objective. Stereo microscopes, however, actually have two separate optical systems; i.e., each eyepiece is paired with its own objective. These two systems are focused to converge at a specific point at which their images overlap, thereby giving the user a three-dimensional or "stereoscopic" view of the specimen. By virtue of its design, the stereo microscope must be precisely collimated and its dual optical systems matched. Nikon uses prisms, not mirrors, and the superb quality of its stereo optics allows prolonged use of the microscope without eye strain or fatigue.

### SMZ-2

This 45° inclined stereo-zoom microscope features continuously variable magnification, with a 5x zoom ratio (objective magnification range: 0.8x to 4x). Magnification range with 10x eyepieces: 8x to 40x; with 15x eyepieces: 12x to 60x; with 20x eyepieces: 16x to 80x. In addition, a variety of attachable auxiliary objective lenses is available. The 0.4x, 0.5x, and 0.7x reduce the magnification in order to achieve greater working distance and depth of field. The 1.5x offers a 50 percent magnification increase, without changing eyepieces.

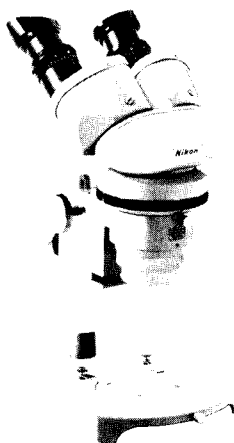
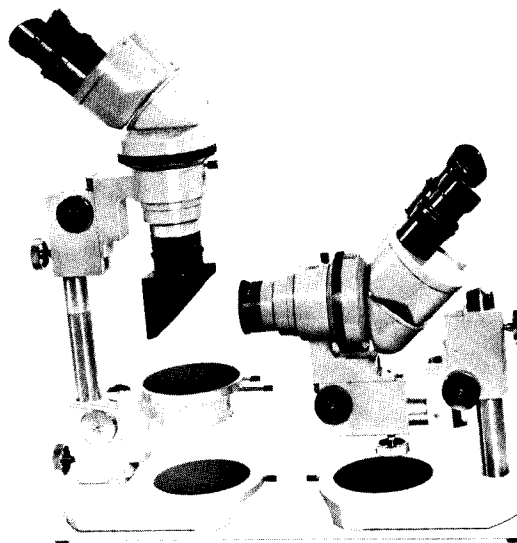
**SMZ-6** is similar to the SMZ-2, except its head is inclined at 30° from the vertical; its zoom ratio is 4.4 (zoom objective magnification is 0.9x to 4x). Magnification range with 10x eyepieces: 9x to 40x; with 15x eyepieces: 13.5x to 60x; with 20x eyepieces: 18x to 80x.

### SM-5

Similar in styling and quality to the SMZ, this is a fixed magnification non-zoom stereo microscope with 2x objectives. Magnification can be varied by changing the eyepieces or by using auxiliary attachable objectives. The inclination is 45°. Magnification range: With 10x eyepieces is 20x. With 15x eyepieces is 30x. With 20x eyepieces is 40x.

76002

SMZ-TEACHING UNIT includes 2 SMZ zoom stereos with 0.5x objectives; half reflecting mirror; base plate; special stage, etc. (less stereo illuminator)



SMZ-2 #76000



SM-5 #76010

### Model SMZ-2 (45° Inclination)

76000

SMZ ZOOM STEREO, 45° inclination from vertical), with Plain Stand, opal/black stage plate insert, 1 pair of wide field eyepieces (10x, or 15x or 20x), 1 pair plastic eyecups, vinyl cover, less case

76005

SMZ-AU as above, less Plain Stand but with Universal Table Stand Type 3

76006

SMZ-AU4 as above, less Plain Stand but with Rack & Pinion Universal Table Stand Type 4

76009

SMZ-A STEREO MICROSCOPE HEAD, with focusing mount (less stand), with 1 pair of wide field eyepieces (10x, or 15x or 20x), 1 pair plastic eyecups and vinyl cover; for use with Universal Table Stand or for mounting optical head on other types of equipment

### Model SMZ-6 (30° Inclination)

76001

SMZ-6 ZOOM STEREO (30° inclination from vertical) with Plain Stand, opal/black stage plate insert, 1 pair of wide field eyepieces (10x, 15x or 20x), 1 pair plastic eyecups, vinyl cover, less case

### Model SM-5 (45° Inclination)

76010

SM-5 STEREO MICROSCOPE with Plain Stand, opal/black stage plate insert Disc, 1 pair of wide field eyepieces (10x or 15x or 20x), 1 pair plastic eyecups, vinyl cover, less case

76015

SM-5AU as above, less Plain Stand, but with Universal Table Stand Type 3

76017

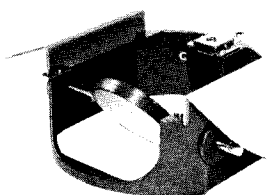
SM-5AU4 as above, less Plain Stand but with rack & pinion Universal Table Stand Type 4

76020

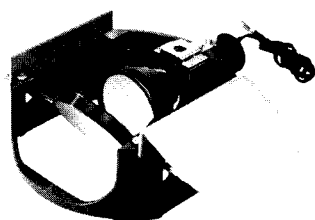
SM-5A STEREO MICROSCOPE HEAD (less stand) with focusing mount, 1 pair of wide field eyepieces (10x or 15x or 20x), 1 pair plastic eyecups and vinyl cover for use with Universal Table Stand or for mounting optical head on other types of equipment



## Interchangeable Accessories for All Stereo Models



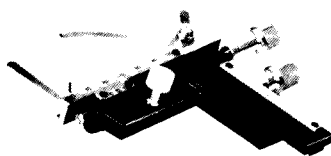
76145



76147



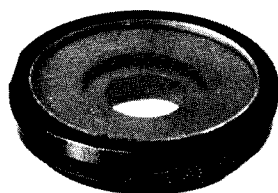
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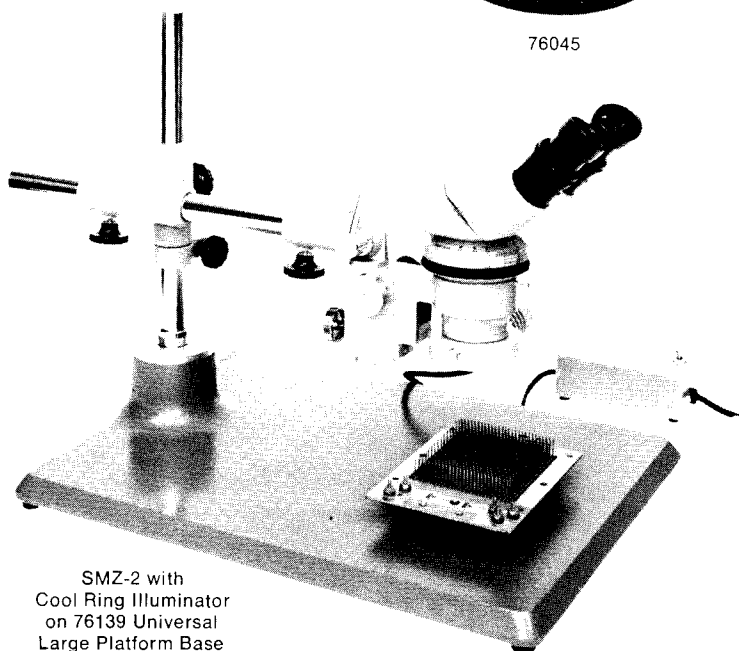
77785



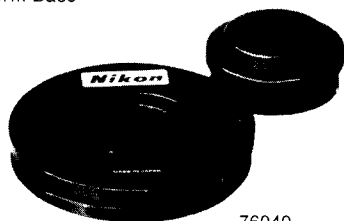
76175



76045



SMZ-2 with  
Cool Ring Illuminator  
on 76139 Universal  
Large Platform Base



76040

### Substage Bases for Diascopic Transillumination of Transparent Specimens.

- 76145 Substage Base for SMZ-SM5 Microscope; with mirror, clear glass plate, arm rests, with provision for rear mounting of illuminator
- 76147 Substage Base for SMZ-SM5; with mirror, clear glass plate for transmitted illumination, arm rests and rear lamp housing (requires socket assembly and transformer listed below)
- 76160 Socket Assembly only for substage illumination base, with 2 6v/18w bulbs, No. 76907
- 76171 Transformer, solid-state, continuously variable with on/off switch, 6v/20w

### Stages

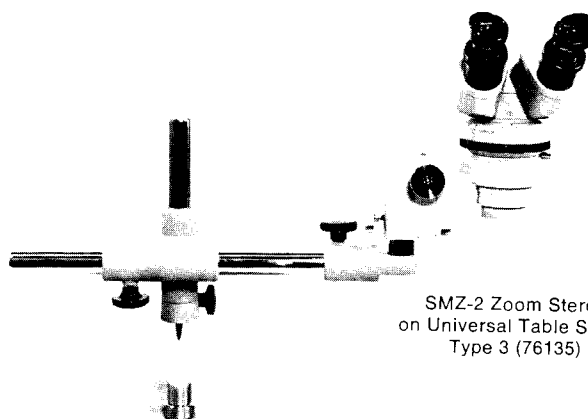
- 76045 Circular Gliding Stage
- 77785 Attachable Mechanical Stage
- 76168 Opal black plate (replacement)
- 76169 Clear Glass plate for substage (replacement)
- 76178 Stereo Stage Clips (pair)
- 75628 Cross travel stage,  $\frac{5}{8}$ " x  $\frac{5}{8}$ ", rotatable

### Eyepieces and Objectives

- 76100 10x paired wide field eyepieces with plastic eyecups
- 76105 15x paired wide field eyepieces with plastic eyecups
- 76110 20x paired wide field eyepieces with plastic eyecups
- 76119 0.4x attachable auxiliary objective
- 76115 0.5 attachable auxiliary objective with extension post for Plain Stand
- 76120 0.5x attachable auxiliary objective
- 76125 0.7x attachable auxiliary objective
- 76130 1.5x attachable auxiliary objective
- 76175 Half reflecting mirror attachment
- 76176 Half reflecting mirror only (replacement)
- 76162 Eye shields (pair)
- 76040 Polarizing Set for all model stereos consisting of filter polarizer and analyzer
- 76250 Objective glass protector (screw in) prevents objects from damaging objective lenses.

### Stands, Cases and Covers

- 76013 Stereo Plain Stand
- 76135 Universal Table Stand Type 3 (plain)
- 76140 Universal Table Stand Type 4 (with rack and pinion motion for boom arm extension control)
- 76139 Universal Table Stand Type 3 on Large Platform Base
- 77900 Vinyl cover for all Stereo (Type 102)
- 76164 Large vinyl cover for SMZ Teaching and AU Stand
- 76065 Polished fitted hardwood case for SMZ, SMZ-6 & SM-5, SM-6
- 76012 Focusing Mount only: for SMZ, SMZ-6 & SM-5, SM-6



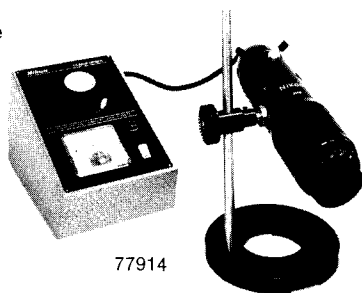
SMZ-2 Zoom Stereo  
on Universal Table Stand,  
Type 3 (76135)

## Illuminators and Accessories

- 76153 Stereo illuminator, Model 2, including 6-step variable transformer 6v/20w, with on/off switch; mounting bracket and 2 bulbs. No. 76907
- 76156 Spotlight attachment for Stereo Illuminator
- 76160 Socket Assembly only for Stereo Illuminator and for substage illumination, with 2 bulbs, 6v/18. No. 76907
- 76171 Transformer, solid-state continuously variable with on/off switch, 6v/20w
- 76907 Bulb, 6v/18w bayonet base, round, for Stereo Illuminator Model 2 & Substage Base
- 77914 Universal Microscope Lamp 6v/30w, with iris diaphragm, continuously variable transformer with voltmeter, and 2 bulbs. (No. 77904)
- 77637 Fiber Optic Illum. Complete w/Bracket Assembly
- 77645 Telescoping Stand to mount Fiber Optic
- 76495 Cool Ring Illuminator (cold cathode) with transformer
- 76493 Cool Ring lamp only with reflector (replacement)
- 76494 Transformer only (replacement) for Dual & Cool Ring
- 76491 Dual Ring with transformer (76494 has twice the illumination of the Cool Ring)
- 76492 Dual Ring lamp only (replacement)
- 76489 Dual Ring reflector only
- 76167 Oversized Focusing Knob, slipover, with set screw

## Slip-on Filters for Stereo Illuminator

- 76230 White Diffusing
- 76232 Clear Blue
- 76234 Diffusing Blue
- 76236 Yellow
- 76238 Green
- 76240 Orange



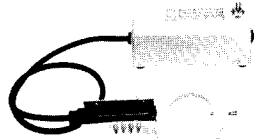
77914



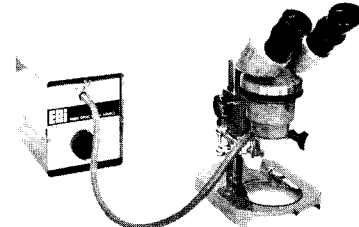
76491



76153



76494



77637 with SMZ  
Zoom Stereo #76000

## Photomicrography

- 76072 Microflex Model PFMB Photomicrographic attachment with main body, viewing screen with 7x magnifier, adapter for M-35S or Leica Camera with screw mount (specify Model Stereo: SMZ, SM-5 or SM)
- 76074 Microflex Model PFMF, same as above, except with camera adapter for Nikon F/Nikkormat cameras
- 77109 Stereo adapter only for SMZ or SM-5 eyepiece tube (diam. 36.5mm)
- 77110 Stereo adapter only; for use with 32.5mm outer diameter eyepiece tube
- 77137 Camera Back M-35S with full 35mm frame and 1/2 frame capability
- 76541 Photo Stand Type II with swivel point, to support Microflex on all Nikon Stereos. Especially recommended for formats larger than 35mm

For additional accessories and other models of Photomicrographic attachments, see pages 28-31.

## Microscope Reticles

### Simplified Reticle Ordering System

In the past, we have listed the same eyepiece reticles under several different product numbers, according to the reticle scale at specific magnifications. This new system, utilizing prefixes for specific identification, should eliminate all confusion.

### KEY

- SO 21mm reticles
- AO 21mm reticle in adapter to 24mm
- FO 21mm reticle in 24mm adapter with reticle holder
- MO 24mm reticle
- HO 24mm reticle with reticle holder

### RETICLE DIAMETER:

- 21mm
- 24mm
- FITS MICROSCOPE MODELS:**
- S-Cb, S-Kt COMPACT, S, S-Ke, L-Ke, APOPHOT, M, MS, EPI Darkfield, CL CLASSIC, POH-3 Trinocular, EPOI/Nikon Forensic
- SMZ, SM-5, SM-1 Stereos, POH-3 Monocular

NEW NO.	DESCRIPTION	OLD NO.
SO 75950	0.1" Scale	76957
AO 75950	Length. 100 graduations	76216
FO 75950		
MO 75951	0.4" Scale	NONE
HO 75951	Length. 200 graduations	

NEW NO.	DESCRIPTION	OLD NO.
MO 75952	0.6" Scale	76205
HO 75952	Length. 200 graduations	76210
SO 75955	0.5" Scale	76201
AO 75955	Length. 100 graduations	76202
FO 75955		76195 76200 76959
MO 75956	0.5" Scale	
HO 75956	Length. 50	NONE
MO 75957	0.6" Scale	76203
HO 75957	Length. 40	76204 76206 70805
SO 75960	5mm Scale	
AO 75960	Length. 100 graduations	NONE
FO 75960		
SO 75961	10mm Scale	
AO 75961	Length. 100 graduations	76956
FO 75961		
SO 75962		
AO 75962	1mm Squares	76963
FO 75962		
SO 75963	0.5mm Squares	
AO 75963		76961
FO 75963		
MO 75965	Cross Line and	76220
HO 75965	30°, 60°, 90°	70817
SO 75966	Cross Line 90°	76962
SO 75967	Whipple disk	

This general survey has been designed to furnish only the most basic facts about Nikon Microscopes and Accessories.

Comprehensive catalogs, fully detailing each piece of equipment, are available. To receive full information, please detach card and indicate the areas of your interest.

## OTHER NIKON PRODUCTS

### Photographic Equipment:

NIKON F2, F2 Photomic cameras  
NIKKORMAT EL camera  
NIKKORMAT FT2 camera  
NIKONOS II all-weather camera  
NIKON SUPER 8 movie camera  
NIKKOR interchangeable lenses  
NIKON accessories including the  
NIKON electronic flash system

### Optical Measuring Instruments:

PROFILE PROJECTORS  
SURFACE FINISH MICROSCOPE  
MEASURESCOPE  
MASK ALIGNMENT MICROSCOPE  
AUTOCOLLIMATOR  
High Temperature MICRO HARDNESS TESTER

### Ophthalmic Instruments:

ZOOM PHOTO SLIT LAMP  
ASPHERICAL OPHTHALMOSCOPIC LENSES  
PROJECTION LENSOMETER  
OCULAR LENSOMETERS

### Astronomical Telescopes

### Binoculars

## Regional Offices:

### Mid-Atlantic

Kensington, Maryland 20795 • 10605 Concord Street  
(301) 621-1080

### West Coast

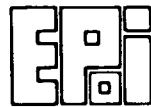
San Francisco, California 94105 • 501 Folsom Street  
(415) 362-7484

### Mid West

Niles, Illinois 60648 • 7550 No. Oak Avenue  
(312) 647-8100

### New England

Wellesley Hills, Massachusetts 02181 • 36 Washington Street  
(617) 969-8600



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Instrument Group,  
623 Stewart Avenue, Garden City, N.Y. 11530 USA  
(516) 248-5200. Telex 967806.  
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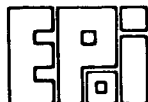


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