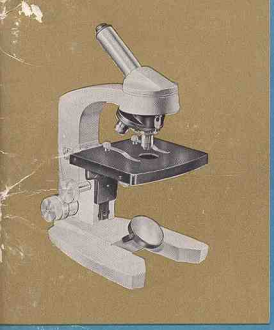
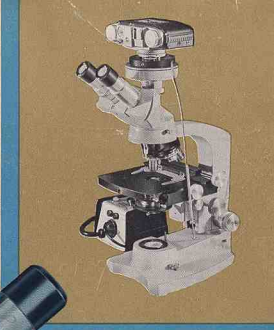
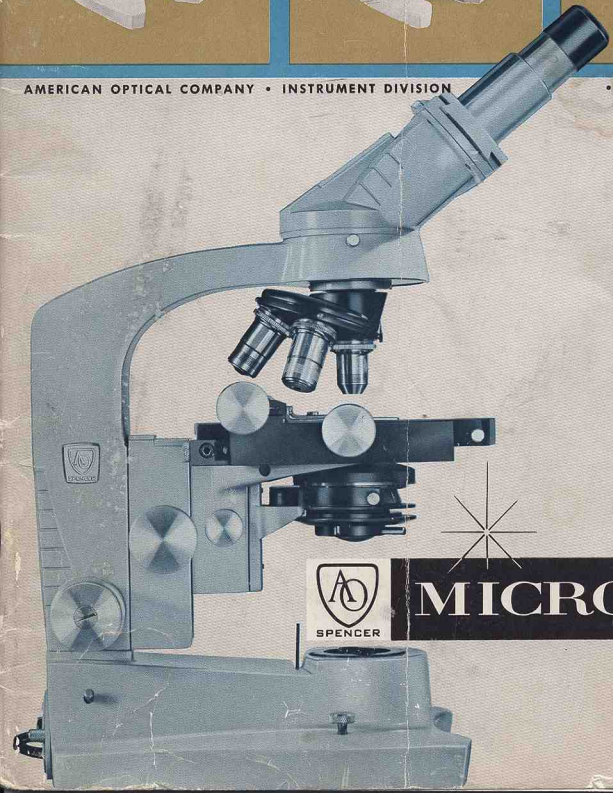


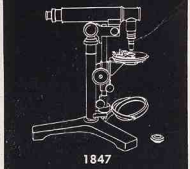


AMERICAN OPTICAL COMPANY • INSTRUMENT DIVISION • BUFFALO 15, NEW YORK



SPENCER

MICROSTAR



1847

1850

Charles A. Spencer, 1813-1881, first American microscope builder.

Mr. Spencer . . . and the microscope

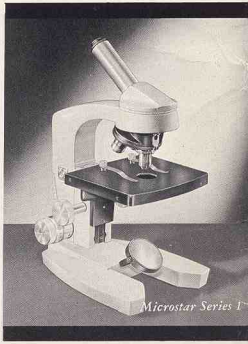
Charles A. Spencer of Canastota, New York, made the first American microscope in 1846. It won for him instant recognition as one of the world's greatest microscope makers. European manufacturers were amazed that a "backwoods American" could make such a precise instrument, and Professor J. W. Bailey of West Point, a world-famous microscopist of that day, called it "a proud triumph for American art".

Charles Spencer died in 1881, but his son, Herbert, remained to carry on the business. In 1890 he moved to Buffalo, N. Y., to establish the Spencer and Smith Optical Company. The name was changed in 1893 to Spencer Lens Company and remained so until 1935 when it became the Instrument Division of the American Optical Company.

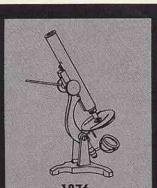
The parent American Optical Company, itself, has a continuous history dating back to 1833 and is the world's largest manufacturer of optical products.

The Instrument Division has been outstanding in the progressive development and production of microscopes for over 100 years . . . was the first in America to produce apochromatic objectives, side fine adjustments, attachable mechanical stages, fork-type substages, converging tube binocular microscopes, divisible substage condensers, dark field illuminators and AUTO-FOCUS. International recognition has also been gained for pioneering such outstanding aids to the Sciences and Industry as the Phase and Interference Microscopes.

American Optical is proud to continue this leadership with its latest series of Microscopes . . . MICROSTAR. These outstanding microscopes carry the proud name of Spencer which is today, as it has been for over a century, your guarantee of the finest quality available in scientific instruments.

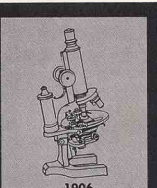


1855

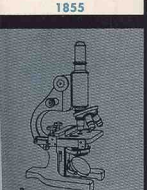


1876

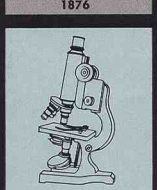
1900



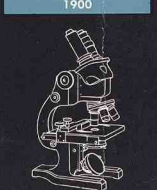
1906



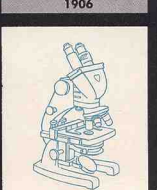
1915



1920



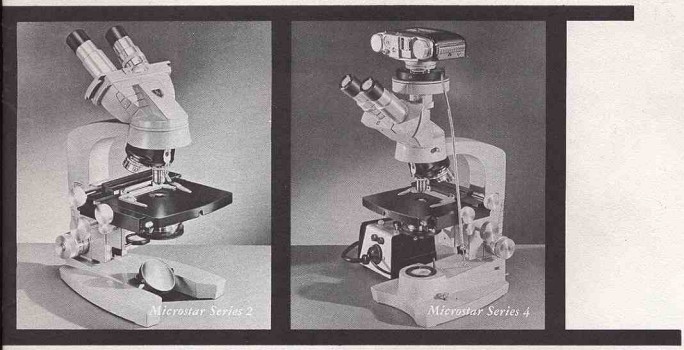
1933



1949

OVER 125 YEARS OF LEADERSHIP IN OPTICS

these basic models give unmatched versatility



a galaxy of outstanding

MICROSTAR FEATURES

Dual cone revolving nosepieces

Advanced styling and design

Interchangeable and reversible bodies

Rigid, well-balanced arm

Focusable stages . . . Variable Autofocus

Wide selection of mechanical stages

Built-in base illuminator

Top quality coated optics

New Epoxy finish

interchangeable . . .

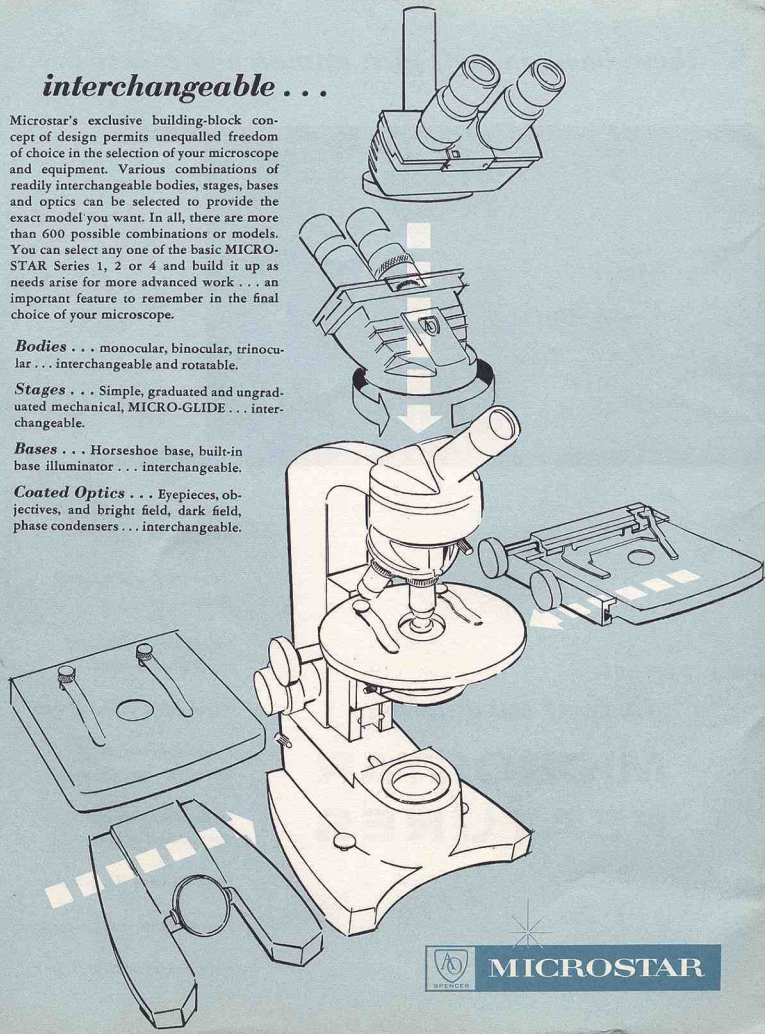
Microstar's exclusive building-block concept of design permits unequalled freedom of choice in the selection of your microscope and equipment. Various combinations of readily interchangeable bodies, stages, bases and optics can be selected to provide the exact model you want. In all, there are more than 600 possible combinations or models. You can select any one of the basic MICRO-STAR Series 1, 2 or 4 and build it up as needs arise for more advanced work . . . an important feature to remember in the final choice of your microscope.

Bodies . . . monocular, binocular, trinocular . . . interchangeable and rotatable.

Stages . . . Simple, graduated and ungraduated mechanical, MICRO-GLIDE . . . interchangeable.

Bases . . . Horseshoe base, built-in base illuminator . . . interchangeable.

Coated Optics . . . Eyepieces, objectives, and bright field, dark field, phase condensers . . . interchangeable.

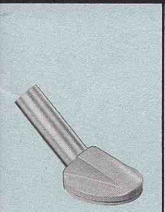


SPENCER MICROSTAR

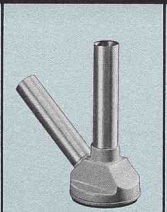
INTERCHANGEABLE AND REVERSIBLE BODIES

Three inclined bodies are available for interchangeable use on MICROSTAR series: monocular, binocular and trinocular; vertical monocular bodies and special photographic monocular body with vertical tube can be supplied for photomicrography (see page 21). All bodies are rotatable 360° so that MICROSTAR can be used in conventional or reverse position. Inclined bodies have magnesium fluoride coating . . . AMERICOTE . . . on the prisms to decrease internal reflection, increase light transmission and improve imagery. Glass windows in the eyetubes of the binocular and trinocular bodies protect the prisms from foreign particles. Binocular and trinocular bodies are graduated for interpupillary and eye-refraction differences. Optimum body inclination and tube convergence assure maximum comfort for efficient observation and photomicrography. An accessory 35mm camera (Cat. No. 635) can be mounted on the trinocular body and special photographic monocular body in place of vertical photomicrographic tube (see page 21).

Bodies Instantly Interchangeable



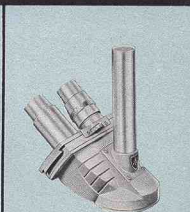
Inclined Monocular Body



Special Photographic Monocular Body

Vertical Monocular Body

Inclined Binocular Body



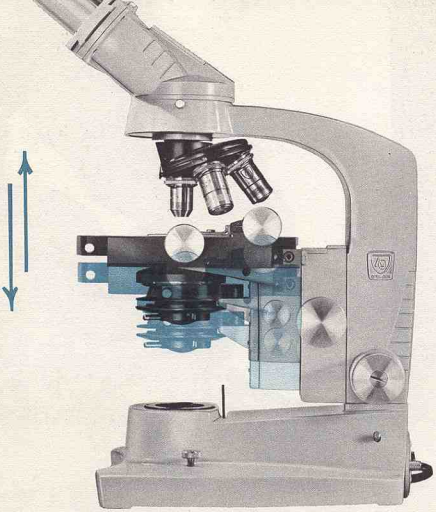
Inclined Trinocular Body

RIGID, WELL-BALANCED ARM

The arm—the structural unit which supports all optical and mechanical parts—is rigid and well-balanced for stability . . . withstands hard usage and handling . . . insures lasting optical alignment. The arm curves away from the stage for an unobstructed view of the stage area and for instant unimpeded access to the specimen. Horizontal clearance between the optical axis and the arm is 112mm. All standard bodies are inclined . . . the inclination joint has been eliminated . . . no nuisance of overflowing immersion oil, mounting fluid, or wet specimens. The fine adjustment knobs are positioned low on the arm for fatigue-free focusing and reduced impact damage.

Rigid, Well-balanced Arm

Sure-grip Portability



focusable stage

The stage and specimen are focusable to the objective by low-positioned coarse and fine adjustments. Body tube height never changes . . . eye level remains constant. The conveniently located ball-bearing-slideway fine adjustment is actuated by a large drum calibrated in 1 micron units . . . and has been time proven for accuracy, responsiveness and durability.

Autofocus, originally developed by AO, has been further advanced to—NOW!—VARIABLE AUTOFOCUS.

Easy to use, VARIABLE AUTOFOCUS essentially eliminates objective and specimen damage even with thick slides, hemacytometers and hanging drop preparations. VARIABLE AUTOFOCUS will tolerate slides 5mm thicker than standard 1.25mm.

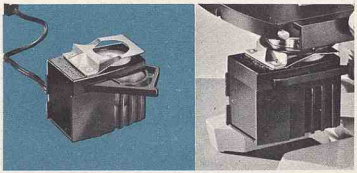
dual-cone revolving nosepieces

Dual-cone construction—an AO exclusive—increases nosepiece life and assures parfocality and correct alignment of all objectives. Hardened steel ball and stainless steel clip engagement provides exact objective centration. As the nosepiece is rotated, objectives not in use pivot under the arm leaving the stage area unobstructed and in clear view. A double, triple or quadruple revolving nosepiece is supplied with MICROSTAR to accommodate the number of objectives specified.

Shock absorbing spring loaded assembly located above revolving nosepiece, together with VARIABLE AUTOFOCUS reduce possibility of damage to objective and specimen.

Click-stop, Dustproof Nosepiece

Damage Prevention Spring



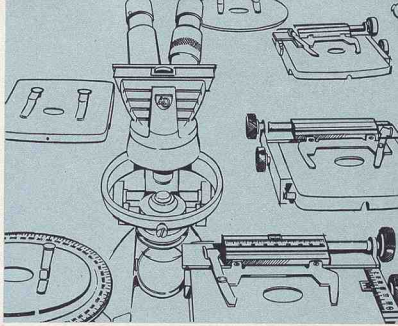
starlite attachable illuminator

STARLITE series illuminators are moderately priced . . . assure sufficient intensity for use with binocular and monocular microscopes . . . completely and uniformly illuminate the entire field of view—low power scanning through oil immersion objectives.

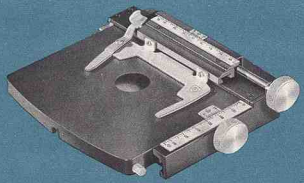
All models feature a swing-out filter holder . . . accommodate and provide convenient interchange of filters for controllable intensity and color contrast . . . bulb replacement is quick and easy.

STARLITE attachable illuminators "N", 612B, and "U", 618B, feature a unique adapter and lock spring device . . . permits positive alignment and attachment to any substage—AO Spencer and other makes—equipped with standard filter holder similar to MICROSTAR type.

Loosen single set screw to remove and interchange stages.



stages . . . interchangeable



1565 "G" Stage, right-hand dual control adjustments.

1562 "U" Stage, left-hand dual control adjustments.

MICROSTAR'S unique building-block concept of design permits you to choose from a wide variety of readily interchangeable stages . . . you select the stage that best suits your requirements for precise specimen positioning.

MECHANICAL STAGES, "G" AND "U"

Two mechanical stages, Graduated "G" stage and Ungraduated "U" stage are available for use with MICROSTAR. Conveniently located dual-control knobs provide fine adjustment accuracy for positive slide and specimen positioning. Both stages are offered with either right or left hand adjustments . . . *mechanical stages for right hand use are supplied unless otherwise specified.* Mechanical stages can be readily racked off to accommodate specimen slides greater than 2" x 3", Petri dishes and special larger chambers.

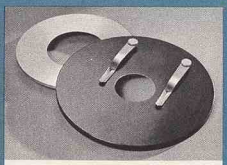
MICRO-GLIDE "F" STAGE

Large bearing surfaces and proper interface lubrication provide unbelievably fine adjustment accuracy of movement . . . in any horizontal direction . . . ideal for quick, low-power scanning . . . intermediate magnification . . . and oil immersion work.

MICRO-GLIDE "C" STAGE

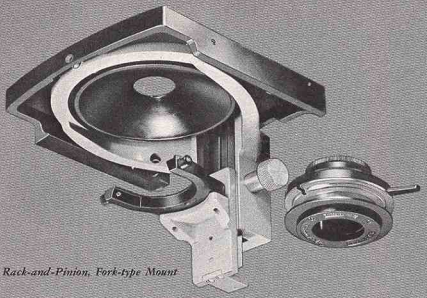
Micro-Glide "C" stage is a graduated rotating model of the Micro-Glide "F" stage. The periphery is graduated in degrees with a vernier reading to three minutes of arc . . . centerable to permit proper specimen orientation.

1536 Rotating, Graduated Stage.



1547 MICRO-GLIDE Stage "F"

1537 Rotating, Graduated MICRO-GLIDE Stage "C"

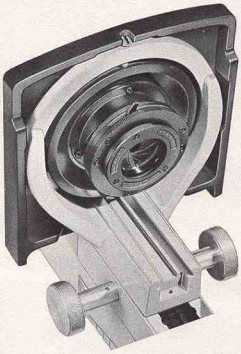


Rack-and-Pinion, Fork-type Mount

The AO SPENCER exclusive fork-type condenser mount with iris diaphragm and appropriate condenser is supplied with MICROSTAR Series 2 and 4. Rack and pinion tension is adjustable to your preference. Fork-type construction permits instantaneous interchange of condensers—is keyed for critical optical and mechanical alignment—and affords easy removal of condenser for effective routine cleaning.

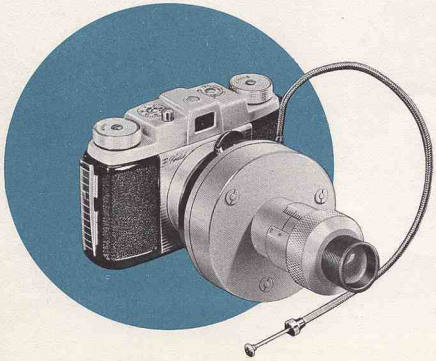
A spiral type focusable condenser mount with iris diaphragm and appropriate condenser is supplied with MICROSTAR I. The condenser can be locked in optimum position by means of a set screw located in the slotted cylindrical mount. MICROSTAR E1 is furnished with an iris diaphragm only but MICROSTAR I substage items can be added to increase usefulness at a future date.

substage mounts



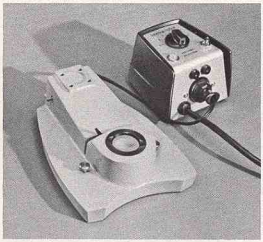
Spiral Cylindrical Mount

35mm Photomicrographic Camera For Use with Trinocular Body and Special Photographic Monocular Body.

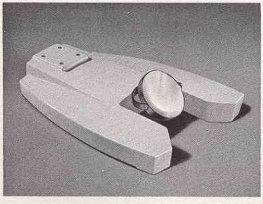


35mm camera

The 35mm Camera with adapter is specifically designed for and conveniently attaches to the trinocular body . . . is rotatable 360° . . . features a coupled visual and photographic system . . . permits simultaneous observation and photography. A built-in camera compensating lens replaces conventional photographic eyepiece . . . matches the parfocality and field coverage of the binocular viewing system. The latest Eastman Kodak Camera Back accepts 35mm black-and-white or color 36 exposure film . . . a dependable Ibsor shutter with speeds T, B, 1/125, 1/50, 1/25, 1/10, 1/5, 1/2, 1 second is supplied.

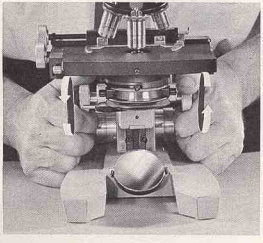


Built-in Base Illuminator Supplied with Microstar 4.

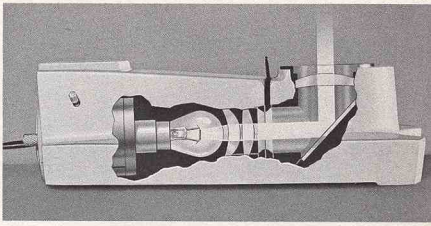


Horseshoe Base, Mirror, Fork Supplied with Microstar E1, 1 and 2.

adjustable tension on focusing controls



Tension on substage and coarse adjustment controls may be set to suit individual preference. With left-hand knob held firmly, a counterclockwise turn of the opposite knob loosens the tension; a clockwise turn tightens it.



built-in base illuminator

This efficient built-in illuminator satisfies the requirements of highly recognized Köhler-type illumination for bright field, phase, dark field microscopy and photomicrography . . . can be effectively used with full range of objective-eyepiece combinations, and monocular, binocular, or trinocular bodies.

The 6V, 15 candle power lamp (G.E. No. 88), two-lens collector system, iris field diaphragm, 90° first-surface mirror and condensing lens are precollimated . . . housed in the microscope base as an integral part of the microscope and assure correct alignment at all times. The optical system is sealed against foreign particles . . . requires no adjustment.

Light intensity can be regulated by the UL approved variable transformer supplied with MICROSTAR 4; illumination characteristics can be altered further by the insertion of 31mm diameter filters into the filter receptacle . . . or by placement of Wratten, neutral density or color compensating filters atop filter receptacle.

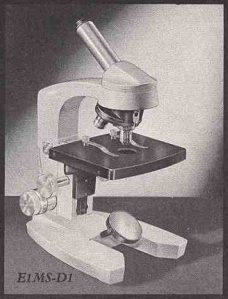
coated optics . . . AMERICOTE

All essential air-glass surfaces in objectives, eyepieces, condensers, and prisms in inclined bodies have magnesium fluoride coating . . . AMERICOTE . . . as standard at no extra cost; decreases internal reflections, increases light transmission and improves imagery.

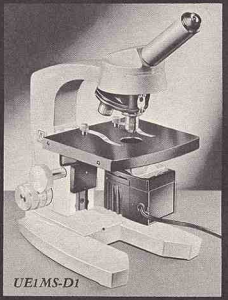
MICROSTAR series E1 and 1

N1MF-H1

Spiral Cylindrical Mount No. 248 Supplied with Series 1.



E1MS-D1



UE1MS-D1

MICROSTAR Series 1 and E1 are supplied with inclined, rotatable, interchangeable monocular body; focusable stage actuated by low-positioned controls . . . rack-and-pinion coarse adjustment with VARIABLE AUTOFOCUS and adjustable tension, ball-bearing slideway fine adjustment graduated in 1 micron increments; dual-cone revolving nosepiece . . . spring loaded shock-absorbing assembly; objectives and eyepieces as selected; horseshoe base; plano-concave mirror or attached illuminator and cabinet.

MICROSTAR Series 1 is furnished with selected condenser, spiral focusing mount and attached iris diaphragm; MICROSTAR Series E1 is furnished with an iris diaphragm only but is designed so that a condenser and spiral mount may be added at a later date (see accessory page 22 for description of 248 spiral mount and selection of condensers).

A wide selection of MICROSTAR Series 1 and E1 is available to satisfy your specific needs. Illustrated models N1MF-H1, E1MS-D1, and UE1MS-D1 . . . and tabulation of additional models on page 11 are presented to simplify your final selection.

Code for series E1 and 1

PREFIXES—PREFIXES designating attached illuminators, and auxiliary condenser precede basic stand numbers.

HYPHEN—Designations for stands, bodies and stages *precede* the HYPHEN in catalog number.
Designations for optical combinations *follow* the HYPHEN in the catalog number.

PREFIXES

- **N** — 612B STARLITE ILLUMINATOR
- **U** — 618B STARLITE ILLUMINATOR
- **X** — 231A SWING-IN AUXILIARY CONDENSER

BASIC STANDS

- **E1**
- **1**

BODY

- **M** — MONOCULAR
- **B** — BINOCULAR
- **T** — TRINOCULAR

STAGES

- **S** — SIMPLE WITH SLIDE CLIPS
- **U** — UNGRADUATED MECHANICAL
- **G** — GRADUATED MECHANICAL
- **F** — MICRO-GLIDE STAGES
- **C** — MICRO-GLIDE STAGES

OBJECTIVES

HYPHEN

- **D** — 10X, 43X — With double nosepiece and N.A. 0.66 Condenser*
- **DA** — 5X, 10X, 43X
- **DB** — 3.5X, 10X, 43X — With triple nosepiece and N.A. 0.66 Condenser*
- **H** — 10X, 43X, 97X — With triple nosepiece and Abbe N.A. 1.25 Condenser
- **HA** — 5X, 10X, 43X, 97X
- **HB** — 3.5X, 10X, 43X, 97X — With quadruple nosepiece and N.A. 1.25 Condenser

**Condensers are not furnished with Microstar Series E1.*

EYEPIECES

- **1** — 10X HUYGENIAN
- **2** — 5X, 10X HUYGENIAN
- **W** — 10X WIDE FIELD

Catalog Number	Rotatable Interchangeable Body	Focusable Stage	Dual-Cone Revolving Nosepiece	Achromatic Objectives	Eyepieces	Condenser	Substage Equipment
SERIES E1							
E1MS-D1	Inclined Monocular "M"	Simple with Slide Clips "S"	Double	10X, 43X	10X Huygenian	Iris Diaphragm Only	Plano-Concave Mirror and Fork
UE1MS-D1	Inclined Monocular "M"	Simple with Slide Clips "S"	Double	10X, 43X	10X Huygenian	Iris Diaphragm Only	Attached No. 618B Starlite Illuminator "U"
E1MS-D2	Inclined Monocular "M"	Simple with Slide Clips "S"	Double	10X, 43X	5X, 10X Huygenian	Iris Diaphragm Only	Plano-Concave Mirror and Fork
E1MS-DB1	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	3.5X, 10X, 43X	10X Huygenian	Iris Diaphragm Only	Plano-Concave Mirror and Fork
SERIES 1							
1MS-D1	Inclined Monocular "M"	Simple with Slide Clips "S"	Double	10X, 43X	10X Huygenian	N.A. 0.66 Condenser, Iris Diaphragm in Spiral Focusing Mount	Plano-Concave Mirror and Fork
1MS-D2	Inclined Monocular "M"	Simple with Slide Clips "S"	Double	10X, 43X	5X, 10X Huygenian	N.A. 0.66 Condenser, Iris Diaphragm in Spiral Focusing Mount	Plano-Concave Mirror and Fork
1MS-DA1	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	5X, 10X, 43X	10X Huygenian	N.A. 0.66 Condenser, Iris Diaphragm in Spiral Focusing Mount	Plano-Concave Mirror and Fork
U1MS-DB2	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	3.5X, 10X, 43X	5X, 10X Huygenian	N.A. 0.66 Condenser, Iris Diaphragm in Spiral Focusing Mount	Attached No. 618B Starlite Illuminator "U"
1MS-H1	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	10X, 43X, 97X	10X Huygenian	N.A. 1.25 Condenser, Iris Diaphragm in Spiral Focusing Mount	Plano-Concave Mirror and Fork
N1MF-H1	Inclined Monocular "M"	Micro-Glide "F"	Triple	10X, 43X, 97X	10X Huygenian	N.A. 1.25 Condenser, Iris Diaphragm in Spiral Focusing Mount	Attached No. 612B Starlite Illuminator "N"
N1MS-H1	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	10X, 43X, 97X	10X Huygenian	N.A. 1.25 Condenser, Iris Diaphragm in Spiral Focusing Mount	Attached No. 612B Starlite Illuminator "N"
1MS-H2	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	10X, 43X, 97X	5X, 10X Huygenian	N.A. 1.25 Condenser, Iris Diaphragm in Spiral Focusing Mount	Plano-Concave Mirror and Fork
U1MS-H2	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	10X, 43X, 97X	5X, 10X Huygenian	N.A. 1.25 Condenser, Iris Diaphragm in Spiral Focusing Mount	Attached No. 618B Starlite Illuminator "U"

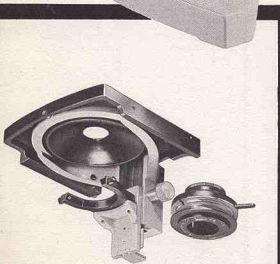
All Microstar Series E1 and 1 supplied with coated—AMERICOTE—optics.
Abbe N.A. 1.25 Condenser may be substituted for N.A. 0.66 Condenser at no change in price.
Cabinet No. 1602 is supplied with MICROSTAR Series E1 and 1. If not desired, see price insert for deduction.
For additional accessories see pages 20-23.

MICROSTAR *series 2*

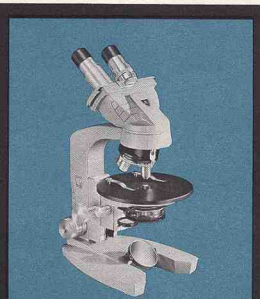
MICROSTAR Series 2 are supplied with inclined, rotatable, interchangeable monocular, binocular, or trinocular bodies; focusable stage actuated by low-positioned controls . . . rack-and-pinion coarse adjustment with VARIABLE AUTOFOCUS and adjustable tension, ball-bearing slideway fine adjustment graduated in 1 micron increments; ungraduated or graduated mechanical stages; dual-cone revolving nosepiece . . . spring loaded shock-absorbing assembly; objectives and eyepieces as selected; Abbe condenser and iris diaphragm in fork-type mount focusable by dual controlled rack and pinion; horseshoe base; plano-concave mirror and fork—or attached illuminator; and cabinet.

A wide selection of MICROSTAR Series 2 is available to satisfy your specific needs. Illustrated models X2BU-HAW, X2BF-HBW and N2MU-HBW and tabulation of additional models on page 13 are presented to simplify your final decision.

X2BU-HAW



Rack-and-Pinion, Fork-type Mount Supplied on Microstar 2.



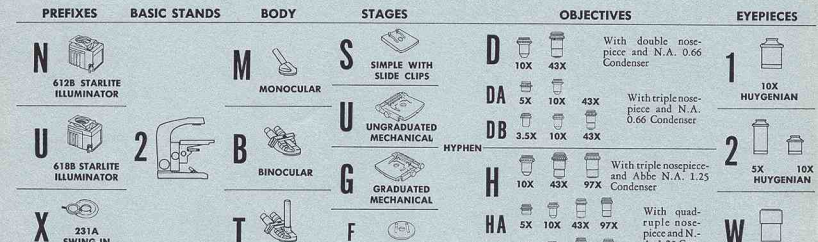
X2BF-HBW

N2MU-HBW

Code for series 2

PREFIXES—PREFIXES designating attached illuminators, and auxiliary condenser precede basic stand numbers.

HYPHEN—Designations for stands, bodies and stages *precede* the HYPHEN in catalog number.
Designations for optical combinations *follow* the HYPHEN in the catalog number.



Catalog Number	Rotatable Interchangeable Body	Focusable Stage	Dual-Cone Revolving Nosepiece	Achromatic Objectives	Eyepieces	Condenser and Iris Diaphragm in Fork-Type Mount	Substage Equipment
MONOCULARS							
2MS-DA1	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	5X, 10X, 43X	10X Huygenian	N.A. 0.66	Plano-Concave Mirror and Fork
U2MS-DB1	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	3.5X, 10X, 43X	10X Huygenian	N.A. 0.66	Attachable No. 618B Starlite Illuminator "U"
2MS-H1	Inclined Monocular "M"	Simple with Slide Clips "S"	Triple	10X, 43X, 97X	10X Huygenian	Abbe N.A. 1.25	Plano-Concave Mirror and Fork
2MU-H2	Inclined Monocular "M"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	5X, 10X Huygenian	Abbe N.A. 1.25	Plano-Concave Mirror and Fork
N2MU-H1	Inclined Monocular "M"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	10X Huygenian	Abbe N.A. 1.25	Attachable No. 612B Starlite Illuminator "N"
X2MU-HA1	Inclined Monocular "M"	Ungraduated Mechanical "U"	Quadruple	5X, 10X, 43X, 97X	10X Huygenian	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror and Fork
N2MF-HAW	Inclined Monocular "M"	Micro-Glide "F"	Quadruple	5X, 10X, 43X, 97X	10X Wide Field	Abbe N.A. 1.25	Attachable No. 612B Starlite Illuminator "N"
N2MU-HBW	Inclined Monocular "M"	Ungraduated Mechanical "U"	Quadruple	3.5X, 10X, 43X, 97X	10X Wide Field	Abbe N.A. 1.25	Attachable No. 612B Starlite Illuminator "N"
BINOCULARS							
2BS-H1	Inclined Binocular "B"	Simple with Slide Clips "S"	Triple	10X, 43X, 97X	Paired 10X Huygenian	Abbe N.A. 1.25	Plano-Concave Mirror and Fork
2BU-H2	Inclined Binocular "B"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Paired 5X, 10X Huygenian	Abbe N.A. 1.25	Plano-Concave Mirror and Fork
2BU-HW	Inclined Binocular "B"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25	Plano-Concave Mirror and Fork
N2BU-HW	Inclined Binocular "B"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25	Attachable No. 612B Starlite Illuminator "N"
X2BF-HBW	Inclined Binocular "B"	Micro-Glide "F"	Quadruple	3.5X, 10X, 43X, 97X	10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror and Fork
X2BU-HAW	Inclined Binocular "B"	Ungraduated Mechanical "U"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror and Fork
N2BG-HB1	Inclined Binocular "B"	Graduated Mechanical "G"	Quadruple	3.5X, 10X, 43X 97X	Paired 10X Huygenian	Abbe N.A. 1.25	Attachable No. 612B Starlite Illuminator "N"
TRINOCULARS							
2TU-H2	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Paired 5X, 10X Huygenian	Abbe N.A. 1.25	Plano-Concave Mirror and Fork
X2TU-HBW	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror and Fork

All Microstar Series 2 supplied with coated—AMERICOTE—optics.
Abbe N.A. 1.25 Condenser may be substituted for N.A. 0.66 Condenser at no change in price.
Cabinet No. 1602 is supplied with MICROSTAR Series 2. If not desired, see price insert for deduction.
For additional accessories, see pages 20-23.

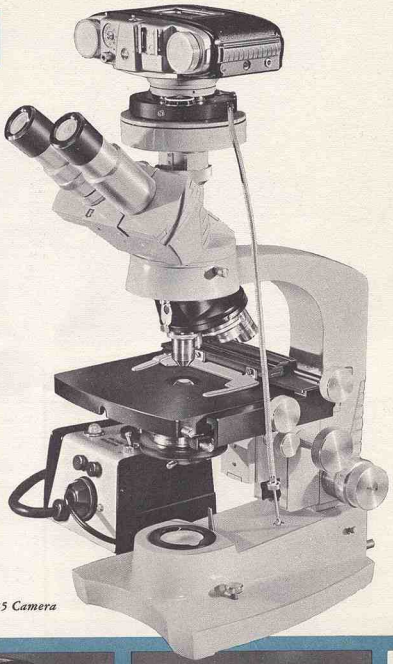
MICROSTAR

series 4

MICROSTAR Series 4 are supplied with inclined, rotatable, interchangeable monocular, binocular or trinocular bodies; focusable stage actuated by low-positioned controls . . . rack-and-pinion coarse adjustment with VARIABLE AUTOFOCUS and adjustable tension, ball-bearing slideway fine adjustment graduated in 1 micron increments; ungraduated or graduated mechanical stages; dual-cone revolving nosepiece . . . spring loaded shock-absorbing assembly; objectives and eyepieces as selected; Abbe condenser and iris diaphragm in fork-type mount focusable by dual controlled rack and pinion; BUILT-IN BASE ILLUMINATOR; variable transformer; and cabinet.

Briefly, MICROSTAR Series 4 are identical to MICROSTAR Series 2 except that a BUILT-IN BASE ILLUMINATOR is supplied in place of the horseshoe base.

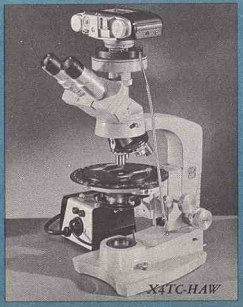
A wide selection of MICROSTAR Series 4 is available to satisfy your specific needs. Illustrated models X4TU-HAW with No. 635 Camera, X4TC-HAW, and 4BU-H1 and tabulation of additional models on page 15 are presented to simplify your final decision.



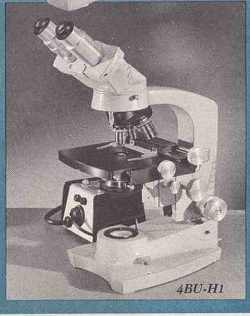
X4TU-HAW with No. 635 Camera

Rack-and-Pinion, Fork-type Mount Supplied on Microstar 4.

Built-in Base Illuminator Supplied with Microstar 4.



X4TC-HAW

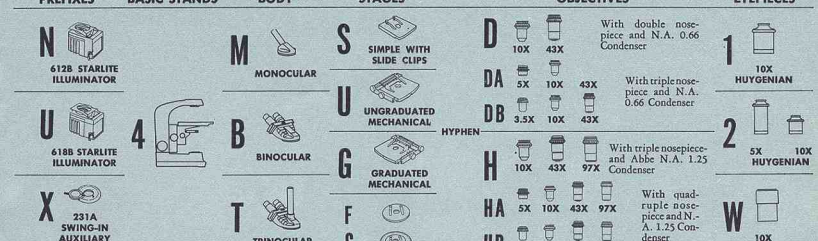


4BU-H1

Code for series 4

PREFIXES—PREFIXES designating attached illuminators, and auxiliary condenser precede basic stand numbers.

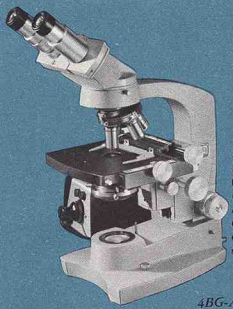
HYPHEN—Designations for stands, bodies and stages *precede* the HYPHEN in catalog number.
Designations for optical combinations *follow* the HYPHEN in the catalog number.



Catalog Number	Rotatable Interchangeable Body	Focusable Stage	Dual-Cone Revolving Nosepiece	Achromatic Objectives	Eyepieces	Condenser and Iris Diaphragm in Fork-Type Mount	Substage Equipment
BINOCULARS							
4BU-H1	Inclined Binocular "B"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Paired 10X Huygenian	Abbe N. A. 1.25	Built-in Base Illuminator and Transformer
4BU-HW	Inclined Binocular "B"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25	Built-in Base Illuminator and Transformer
X4BS-HAW	Inclined Binocular "B"	Simple with Slide Clips "S"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4BF-HAW	Inclined Binocular "B"	Micro-Glide "F"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4BU-HBW	Inclined Binocular "B"	Ungraduated Mechanical "U"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4BG-HA2	Inclined Binocular "B"	Graduated Mechanical "G"	Quadruple	5X, 10X, 43X, 97X	Paired 5X, 10X Huygenian	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
TRINOCULARS							
4TU-H2	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Paired 5X, 10X Huygenian	Abbe N.A. 1.25	Built-in Base Illuminator and Transformer
4TU-HW	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Triple	10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25	Built-in Base Illuminator and Transformer
X4TS-HAW	Inclined Trinocular "T"	Simple with Slide Clips "S"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 213A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4TU-HBW	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4TC-HAW	Inclined Trinocular "T"	Rotating, Graduated Micro-Glide "C"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe, N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4TG-HA2	Inclined Trinocular "T"	Graduated Mechanical "G"	Quadruple	5X, 10X, 43X, 97X	Paired 5X, 10X Huygenian	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4TU-HAW	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer
X4TU-HBW with No. 635 Camera	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer

All MICROSTAR Series 4 microscopes supplied with coated—AMERICOTE—optics.
Cabinet No. 1604 is supplied with MICROSTAR Series 4. If not desired, see price insert for deduction.
For additional accessories, see pages 20-23.

APOSTAR series 2 *and* 4



A wide selection of APOSTAR Series 2 and 4 is available to satisfy your specific requirements. Illustrated models 2TC-APQ3 and 4BG-APQ3 and tabulations of additional models on page 17 are presented to simplify your final decision.

*4BG-APQ3**

*2TC-APQ3**

*Supplied with 5X, 10X, 15X paired Compensating Eyepieces.

APOSTAR Series are supplied with apochromatic objectives . . . provide high numerical apertures and optimum color corrections to assure crisp definition and clear resolution for the most critical visual microscopy and photomicrography. Compensating eyepieces and achromatic condenser in centerable mount permit fullest advantage of superior definition and color correction offered by apochromats. Objectives, eyepieces, condenser and all essential air-glass surfaces are coated (AMERICOTE). In addition, APOSTAR offers important versatility, stability and ease of adjustments for accurate, rapid, effortless specimen examination and photomicrography.

APOSTAR Series 2 and 4 are supplied with inclined, rotatable, interchangeable binocular or trinocular bodies; focusable stage actuated by low-positioned controls . . . rack-and-pinion coarse adjustment with VARIABLE AUTOFOCUS and adjustable tension, ball-bearing slideway fine adjustment graduated in 1 micron increments; ungraduated or graduated mechanical stage, Micro-Glide stage or rotating graduated Micro-Glide stage as selected; dual-cone revolving nosepiece . . . spring loaded shock-absorbing assembly; coated apochromatic objectives and compensating eyepieces as selected; coated achromatic condenser, N.A. 1.30, and iris diaphragm in centerable fork-type mount focusable by dual controlled rack and pinion; BUILT-IN BASE ILLUMINATOR with variable transformer supplied on Series 4, plain base with mirror and fork supplied on Series 2; complete with cabinet.

APOSTAR CODE

BASIC STANDS | **BODY** | **STAGES** | **OBJECTIVES** | **EYEPIECES**

2

M — MONOCULAR

B — BINOCULAR

T — TRINOCULAR

S — SIMPLE WITH SLIDE CLIPS

U — UNGRADUATED MECHANICAL

G — GRADUATED MECHANICAL

F — MICRO-GLIDE

C — GRADUATED, ROTATING MICRO-GLIDE

APT — 10X, 43X, 90X APOCHROMATIC WITH TRIPLE NOSEPIECE AND N.A. 1.30 CONDENSER IN CENTERABLE MOUNT

2 — 5X, 10X COMPENSATING

HYPHEN

4

APQ — 10X, 20X, 43X, 90X APOCHROMATIC WITH QUADRUPLE NOSEPIECE AND N.A. 1.30 CONDENSER IN CENTERABLE MOUNT

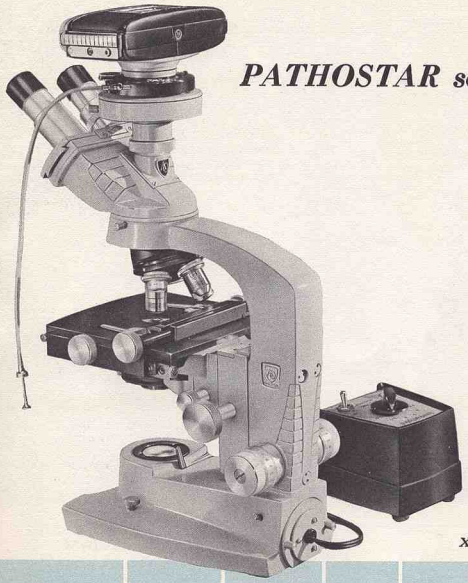
3 — 5X, 10X, 15X COMPENSATING

Catalog Number	Rotatable Interchangeable Body	Focusable Stage	Dual-Cone Revolving Nosepiece	Apochromatic Objectives	Paired Compensating Eyepieces	Achromatic Condenser Iris Diaphragm in Centerable Fork-type Mount	Substage Equipment
BINOCULAR							
2BC-APQ3	Inclined Binocular "B"	Rotating Graduated MICRO-GLIDE "C"	Quadruple	10X, 20X, 43X, 90X	5X, 10X, 15X	N.A. 1.30	Plano-Concave Mirror
2BG-APQ3	Inclined Binocular "B"	Graduated Mechanical "G"	Quadruple	10X, 20X, 43X, 90X	5X, 10X, 15X	N.A. 1.30	Plano-Concave Mirror
2BG-APT2	Inclined Binocular "B"	Graduated Mechanical "G"	Triple	10X, 43X, 90X	5X, 10X	N.A. 1.30	Plano-Concave Mirror
4BC-APQ3	Inclined Binocular "B"	Rotating Graduated MICRO-GLIDE "C"	Quadruple	10X, 20X, 43X, 90X	5X, 10X, 15X	N.A. 1.30	Built-in Base Illuminator & Transformer
4BF-APT2	Inclined Binocular "B"	MICRO-GLIDE "F"	Triple	10X, 43X, 90X	5X, 10X	N.A. 1.30	Built-in Base Illuminator & Transformer
4BG-APQ3	Inclined Binocular "B"	Graduated Mechanical "G"	Quadruple	10X, 20X, 43X, 90X	5X, 10X, 15X	N.A. 1.30	Built-in Base Illuminator & Transformer
TRINOCULAR							
2TC-APQ3	Trinocular "T"	Rotating Graduated MICRO-GLIDE "C"	Quadruple	10X, 20X, 43X, 90X	5X, 10X, 15X	N.A. 1.30	Plano-Concave Mirror
2TG-APQ3	Trinocular "T"	Graduated Mechanical "G"	Quadruple	10X, 20X 43X, 90X	5X, 10X, 15X	N.A. 1.30	Plano-Concave Mirror
2TG-APT2	Trinocular "T"	Graduated Mechanical "G"	Triple	10X, 43X, 90X	5X, 10X	N.A. 1.30	Plano-Concave Mirror
4TC-APQ3	Trinocular "T"	Rotating Graduated MICRO-GLIDE "C"	Quadruple	10X, 20X, 43X, 90X	5X, 10X, 15X	N.A. 1.30	Built-in Base Illuminator & Transformer
4TF-APT2	Trinocular "T"	MICRO-GLIDE "F"	Triple	10X, 43X, 90X	5X, 10X	N.A. 1.30	Built-in Base Illuminator & Transformer
4TG-APQ3	Trinocular "T"	Graduated Mechanical "G"	Quadruple	10X, 20X, 43X, 90X	5X, 10X, 15X	N.A. 1.30	Built-in Base Illuminator & Transformer

Cabinet No. 1602 is supplied with APOSTAR Series 2, Cabinet No. 1604 is supplied with APOSTAR Series 4. If not desired, see price insert sheet for deduction.

No. C158 90X oil immersion apochromatic objective, N.A. 1.30, and No. C235 condenser, N.A. 1.30 are supplied as standard with above catalog outfits. See accessory pages 20-23 for alternate compensating eyepieces, apochromatic objectives and No. C236 achromatic condenser, N.A. 1.40.

PATHOSTAR series 2 and 4



X4TU-HAW with No. 635 Camera

PATHOSTAR Series have been specifically designed to meet the exacting requirements of the pathologist for outstanding optical and mechanical performance.

PATHOSTAR assures him of clearly resolved imagery . . . comfortable posture and ease of adjustment manipulation so that he can effortlessly perform his slide diagnosis accurately and rapidly. In addition . . . it offers important versatility and stability to satisfy his needs for desirable photomicrographic case records.

Catalog Number	Rotatable Interchangeable Body	Focusable Stage	Dual-Cone Revolving Nosepiece	Achromatic Objectives	Eyepieces	Condenser and Iris Diaphragm in Fork-Type Mount	Substage Equipment
SERIES 2							
X2BS-HBW	Inclined Binocular "B"	Simple with Slide Clips "S"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror
X2BU-HAW	Inclined Binocular "B"	Ungraduated Mechanical "U"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror
X2TU-HBW	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror
N2BF-HBW	Inclined Binocular "B"	Micro-Glide "F"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	N.A. 1.25 with No. 231A Auxiliary Condenser	Plano-Concave Mirror
SERIES 4							
X4BS-HBW	Inclined Binocular "B"	Simple with Slide Clips "S"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	N.A. 1.25 with No. 231A Auxiliary Condenser	Base Illuminator and Transformer
X4BU-HBW	Inclined Binocular "B"	Ungraduated Mechanical "U"	Quadruple	3.5X, 10X, 43X, 97X	Pair 10X Wide Field	N.A. 1.25 with No. 231A Auxiliary Condenser	Base Illuminator and Transformer
X4TU-HAW	Inclined Trinocular "T"	Ungraduated Mechanical "U"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	N.A. 1.25 with No. 231A Auxiliary Condenser	Base Illuminator and Transformer
X4TC-HAW	Inclined Trinocular "T"	Rotating, Graduated Micro-Glide "C"	Quadruple	5X, 10X, 43X, 97X	Pair 10X Wide Field	Abbe N.A. 1.25 with No. 231A Auxiliary Condenser	Built-in Base Illuminator and Transformer

All PATHOSTAR Series 2 and 4 supplied with coated—AMERICOTE—optics.
Cabinet No. 1602 is supplied with PATHOSTAR Series 2. Cabinet No. 1604 is supplied with PATHOSTAR Series 4. If not desired, see price insert for deductions.

BACTISTAR Series have been specifically designed to meet the exacting requirements of the bacteriologist for precise bacteria or mold counts. Interpupillary distance of user should be specified for accurate calibration of binocular bodies.

BACTISTAR series 2 and 4

BACTERIA COUNT — BACTISTAR

Catalog Number	Rotatable Interchangeable Body	Focusable Stage	Nosepiece	Achromatic Objectives	Eyepieces Huygenian with Crosshair	Condenser and Iris Diaphragm in Fork-Type Mount	Substage Equipment
2MU-YZ	Inclined Monocular "M"	Ungraduated Mechanical "U"	Single Objective Adapter	97X Oil Immersion	5X—Calibrated 300,000 10X—Calibrated 600,000	Abbe N.A. 1.25	Plano-Concave Mirror
2BU-Z	Inclined Binocular "B"	Ungraduated Mechanical "U"	Single Objective Adapter	97X Oil Immersion	Paired 10X Calibrated 600,000	Abbe N.A. 1.25	Plano-Concave Mirror
2BU-HYZ	Inclined Binocular "B"	Ungraduated Mechanical "U"	Triple Revolving	10X, 43X 97X Oil Immersion	Paired 5X Calibrated 300,000 Paired 10X Calibrated 600,000	Abbe N.A. 1.25	Plano-Concave Mirror
4BU-HYZ	Inclined Binocular "B"	Ungratuated Mechanical "U"	Triple Revolving	10X, 43X, 97X Oil Immersion	Paired 5X Calibrated 300,000 Paired 10X Calibrated 600,000	Abbe N.A. 1.25	Built-in Base Illuminator and Transformer

MOLD COUNT — BACTISTAR

Catalog Number	Rotatable Interchangeable Body	Focusable Stage	Nosepiece	Achromatic Objectives	Eyepieces Huygenian with Howard Disc	Condenser and Iris Diaphragm in Fork-Type Mount	Substage Equipment	Total Magnifications
2MU-MC1	Inclined Monocular "M"	Ungraduated Mechanical "U"	Single Objective Adapter	10X	10X Huygenian Calibrated field 1.382mm	N.A. 0.66	Plano-Concave Mirror	100X
2MU-MC2	Inclined Monocular "M"	Ungraduated Mechanical "U"	Double Revolving	10X, 20X	10X Huygenian Calibrated field 1.382mm	N.A. 0.66	Plano-Concave Mirror	100X 200X
2BU-MC3	Inclined Binocular "B"	Ungraduated Mechanical "U"	Quadruple Revolving	10X, 20X, 43X, 97X Oil Immersion	Paired 10X Huygenian Calibrated field 1.382mm	Abbe N.A. 1.25	Plano-Concave Mirror	100X, 200X, 430X, 970X
4BU-MC3	Inclined Binocular "B"	Ungraduated Mechanical "U"	Quadruple Revolving	10X, 20X, 43X, 97X Oil Immersion	Paired 10X Huygenian Calibrated field 1.382mm	Abbe N.A. 1.25	Base Illuminator and Transformer	100X, 200X, 430X, 970X

All BACTISTAR Series 2 and 4 supplied with coated—AMERICOTE—optics.
No. 417 Howard Mold Counting Chamber (see accessory page 20) and two cover glasses supplied with each Mold Count BACTISTAR.

ALTERNATE PARTS AND ACCESSORIES

C133 C142

HUYGENIAN EYEPIECES

Catalog Number	Description
C133	5X AMERICOTE, single
C1133	5X AMERICOTE, paired
C142	10X AMERICOTE, single
C1142	10X AMERICOTE, paired

COMPENSATING EYEPIECES

C1168

C166	5X AMERICOTE, single
C1166	5X AMERICOTE, paired
C167	10X AMERICOTE, single High Eyepoint
C1167	10X AMERICOTE, paired High Eyepoint
C168	10X AMERICOTE, single
C1168	10X AMERICOTE, paired
C170	15X AMERICOTE, single
C1170	15X AMERICOTE, paired

NEW WIDE FIELD EYEPIECES

146 147

435

Catalog Number	Description
146	10X W.F. AMERICOTE Single
147	15X W.F. AMERICOTE Single
435	10X W.F. Focusable Eyepiece Accepts standard reticles for 1146, 1147 Eyepieces
1146	10X W.F. AMERICOTE Pair
1147	15X W.F. AMERICOTE Pair

EYESHIELDS

149

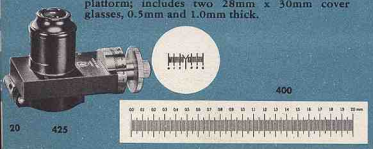
For Eyepieces 146, 147, 1146, 1147

MEASURING AND COUNTING ACCESSORIES

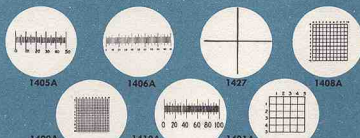
FOR HUYGENIAN AND COMPENSATING EYEPIECES (21 mm. dia.)

405 422 416 427

405	Micrometer Disc 5mm scale divided into 50 units
422	Net Micrometer Disc 5mm square subdivided into 100 squares.
416	Whipple Net Micrometer Disc 7.5mm square subdivided into 100 squares. Center square further subdivided into 25 squares.
427	Cross-Hair Disc
410	Micrometer Disc 5mm scale divided into 100 units.
413	Howard Mold Disc.
C420	Micrometer Eyepiece 10X with focusing eyelens. 5mm scale divided into 100 units.
425	Screw Micrometer Eyepiece, 10X, Filar-type. 6mm scale divided into 50 units. Each unit exactly equivalent to one revolution of drum graduated into 100 parts.
400	Stage Micrometer 2mm scale divided into 200 .01mm units. Mounted on 25mm x 75mm slide. For calibration of eyepiece micrometer discs and fields of view.
417	Howard Mold Counting Chamber 75mm x 35mm; platform area 15mm x 20mm, depth 0.1mm; parallel lines 1.382mm apart traverse side of polished platform; includes two 28mm x 30mm cover glasses, 0.5mm and 1.0mm thick.



FOR 146, 147, 1146, 1147, 435 (20 mm. dia.)


1405A 1406A 1427 1408A
1409A 1410A 1421A

1405A	Micrometer Disc 5mm Scale divided into 50 units
1406A	Micrometer Disc 10mm Scale divided into 100 units
1407A	Micrometer Disc 10mm Scale divided into 200 units
1408A	Net Micrometer Disc 10mm square subdivided into 100 squares
1409A	Net Micrometer Disc 10mm square subdivided into 400 squares
1410A	Micrometer Disc 5mm Scale divided into 100 units
1421A	Net Micrometer Disc 5mm square subdivided into 25 squares
1427	Cross-Hair Disc
148	Micrometer Disc Mount for No. 147 15X W.F. Eyepiece
469	Spanner Wrench for No. 146 10X W.F. Eyepiece
400	Stage Micrometer 2mm Scale divided into 200 .01mm units. Mounted on 25mm x 75mm slide. For calibration of eyepiece micrometer discs and fields of view.
436	10X W.F. Focusable Eyepiece with No. 1406A micrometer scale.

No additional charge is made for 148 or 469 when MICROSTAR is ordered with counting or measuring disc.

469

148

ACHROMATIC OBJECTIVES

Catalog Number	Initial Magnification	Equivalent Focal Length	Numerical Aperture	Working Distance
C105	3.5X	30mm	0.09	11mm
C107	5X	25	.20	20
C109	10X	16	0.25	6.8
C110*	10X, 4.2X	16, 32	0.25, 0.10	6.8
C112	20X	8	0.50	1.3
C115	43X	4	0.66	0.73
C125	50X oil immersion	3.6	0.95	0.37
C127	97X oil immersion	1.8	1.25	0.12
C1292**	97X oil immersion	1.8	1.25	0.13

*Separable Objective **With built-in iris diaphragm

APOCHROMATIC OBJECTIVES

Catalog Number	Initial Magnification	Equivalent Focal Length	Numerical Aperture	Working Distance
C150	10X	16mm	0.30	5.2mm
C152	20X	8	0.60	0.65
C154†	43X	4	0.95	0.15
C158	90X oil immersion	2	1.30	0.08
C159	90X oil immersion	2	1.40	0.05

†With collar adjustment in mount for cover-glass correction.
Apochromatic Objectives sold only with complete APOSTAR outfits.

BODIES

Interchangeable for MICROSTAR

- **74A** Monocular, vertical with adjustable drawtube (for photomicrography)
- **74B** Monocular, 40° inclined, "M"
- **74F** Monocular, vertical with fixed tube (for photomicrography)
- **94** Binocular, inclined, "B"
- **96** Trinocular, inclined, "T"
- **1092** Special Photographic Monocular Body with Vertical Photographic Tube and Inclined Visual Tube
- **1094** Binocular, inclined "B" with Bertrand lens
- **1096** Trinocular, inclined "T" with Bertrand lens
- **1099** Trinocular, inclined "T" with Bertrand lens and slide-out prism

NOSEPIECES

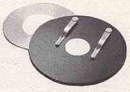
Catalog Number	Description
251	Single Objective adapter for MICROSTAR 1, 2, 4
252	Double Dual-Cone Revolving for MICROSTAR 1, 2, 4
253	Triple Dual-Cone Revolving for MICROSTAR 1, 2, 4
254	Quadruple Dual-Cone Revolving for MICROSTAR 1, 2, 4

1565

1562

1537

1536


1547

STAGES

Catalog Number	Description
Stages . . . Interchangeable for MICROSTAR E1 and 1 Series	
1549	MICRO-GLIDE Stage "F" with stage clips
1563	Ungraduated Mechanical Stage "U". Right-hand dual control adjustments.
1564	Ungraduated Mechanical Stage "U". Left-hand dual control adjustments.
1529	Plain Stage "S" with clips for E1, 1.
Stages . . . Interchangeable for MICROSTAR Series 2 and 4	
1561	Ungraduated Mechanical Stage "U". Right-hand dual control adjustments.
1562	Ungraduated Mechanical Stage "U". Left-hand dual control adjustments.
1565	Graduated Mechanical Stage "G". Right-hand dual control adjustments.
1566	Graduated Mechanical Stage "G". Left-hand dual control adjustments.
1537	Rotating, Graduated MICRO-GLIDE Stage "C" with stage clips.
1536	Same as 1537, but without Micro-Glide plate.
1547	MICRO-GLIDE Stage "F" with stage clips.
1526	Plain Stage "S" with clips.

CONDENSERS AND MOUNTS

C232

C233

231A

C234

C235

C236

CONDENSERS

Catalog Number	Description	For Use With Cond. Mount No.
C232	Abbe Condenser N.A. 0.66	248,243
C233	Abbe Condenser N.A. 1.25	248, 243
231A	Auxiliary swing-in condenser for use with scanning objectives 3.5X and 5X	248 with C233 or 243 with C233
C234	Wide angle condenser N.A. 1.40	244
C235	Achromatic Condenser N.A. 1.30	244
C236	Achromatic Condenser N.A. 1.40	244

CONDENSER MOUNTS

243

244

Catalog Number	Description	Condenser Number
248	Spiral focusing mount without iris diaphragm (use iris furnished with MICROSTAR)	C232, C233
243	Fork-type mount with iris diaphragm	C232, C233
244	Centerable fork-type mount with iris diaphragm	C235, C236

BASES, MIRRORS AND MIRROR FORKS

201

192

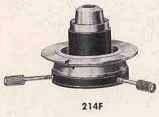
188

193

404

Catalog Number	Description
404	Base Illuminator with Transformer for MICROSTAR 4
201	Horseshoe Base for MICROSTAR E1, 1 and 2
192	Plano-concave mirror for MICROSTAR 1, 2, 4
188	Fork-mount and pedestal for No. 192 mirror on MICROSTAR 4
193	Fork-mount for No. 192 mirror on MICROSTAR E1, 1 and 2

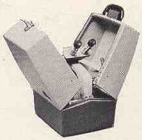
DARK FIELD CONDENSERS AND ILLUMINATORS



214F

218F

Catalog Number	Description
214F	Dark field condenser in centerable fork-type mount for MICROSTAR 2 and 4.
218F	Dark field condenser in centerable fork-type mount with centerable built-in 6.5V 1.7 amp illuminator for MICROSTAR 2 and 4. Without transformer.
350	Variable transformer 110-115 volt to 6.5 volt for use with 218F.

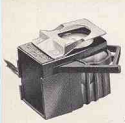


1612

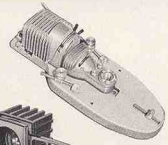
1602

CABINETS AND CARRYING CASES

Catalog Number	Description
1602	Cabinet for MICROSTAR 1, 2
1604	Cabinet for MICROSTAR 4
1612	Professional Carrying Case for MICROSTAR 1 and 2



612B



600

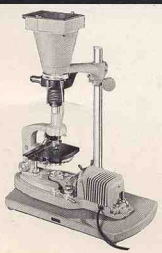
609B

370A

735C

ILLUMINATORS

Catalog Number	Description
609B	Starlite Substage Illuminator with swing-out filter holder, ground blue filter, 15W 115V lamp, cord and switch.
610B	Starlite Substage Illuminator complete with condenser lens, reflector, swing-out filter holder, clear blue filter, 15W 115V lamp, cord and switch.
612B	Starlite Attachable Illuminator "N", same as 610B, but with adapter for insertion into standard microscope filter slot of MICROSTAR Series E1, 1, 2 or previous similiar AO Spencer microscopes and similiar models of other manufacture.
618B	Starlite Attachable Illuminator "U", same as 609B, but with adapter for insertion into standard microscope filter slot of MICROSTAR Series E1, 1, 2 or previous similiar AO Spencer microscopes and similiar models of other manufacture.
370A	Adjustable Microscope Illuminator with iris diaphragm, blue and ground glass filters, 2 lens system, with adjustable ring stand, 100 watt, 120 volt bayonet base lamp, and 5 foot cord with switch.
735C	Microscope Illuminator with multiple filter holder, iris diaphragm, blue and ground glass filters, rack-and-pinion focus condensing system, screw type tilting adjustment in base, integral heat absorbing glass, 100 watt, 120 volt lamp and 8 foot cord with switch. UL and CSA approved.
600	Ortho-Illuminator complete with three-point positioning device for microscope base; turret-mounted intensity and color filters; pinhole eyepiece; one 100 watt, 115 volt lamp; two way switch, cord and plug.



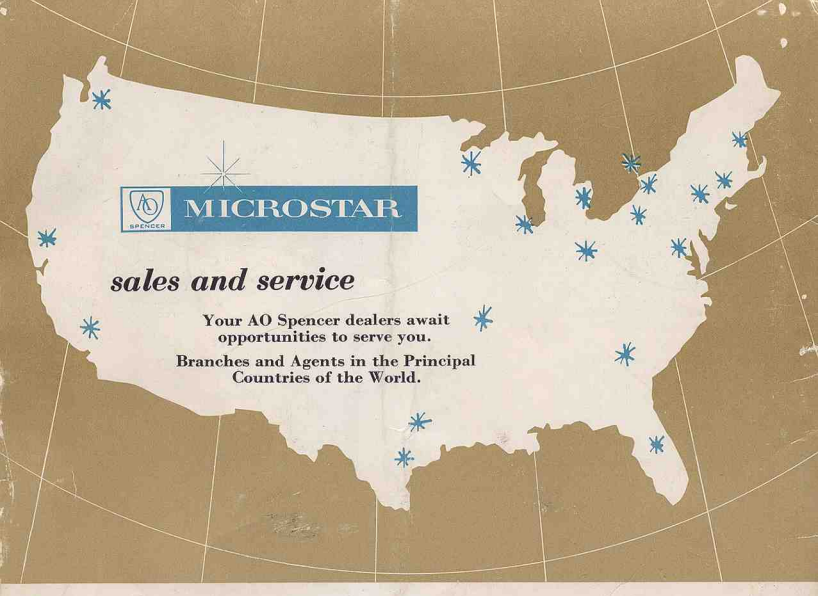
CAMERAS

CATALOG NO. 635. 35mm Photomicrographic camera; Ibsor shutter; speeds: T, B, 1/125, 1/50, 1/10, 1/5, 1/2 and 1 second; complete with compensating lens, and adapter to fit MICROSTAR series 2T and 4T. Result magnification at film plane is 2½ times initial magnification of objective.

CATALOG NO. 682B. Photomicrographic camera complete with base and arm, flexible light-tight adapter, focusing telescope with Universal shutter, 4" x 5" fixed camera back, two 4" x 5" Graphic double plate holders. See Brochure SB682 for detailed information on other No. 682 series cameras.

635

The equipment supplied may not agree in all details with the descriptions or illustrations shown, as instruments are subject from time to time to modification and improvement.



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SB124-Rev. 1259

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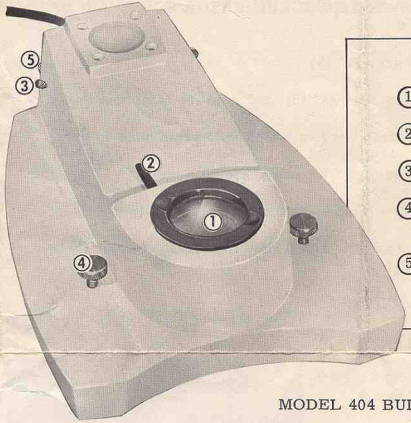
SPENCER

MODEL 404 BUILT-IN BASE ILLUMINATOR

REFERENCE SHEET



1. Light well
2. Field diaphragm lever
3. Lamp centering screws
4. Field diaphragm centering screws
5. Lamp base holding screws

MODEL 404 BUILT-IN BASE ILLUMINATOR

Model 404 Illuminator is supplied as standard with AO Spencer MICROSTAR Series 4 and L6... and is interchangeable with plain microscope base supplied with Series 2 and 6.

Observe following instructions to assure favorable results:

A. FOR MICROSTAR ALREADY EQUIPPED WITH BASE ILLUMINATOR

1. Place a ground glass or paper tissue over light well (1)
2. Close field diaphragm (2) almost completely
3. Center light beam imaged on ground glass or tissue paper by means of knurled lamp centering screws (3). Remove ground glass or paper tissue and reopen iris diaphragm (2) midway
4. Focus onto specimen with 10X objective
5. Focus condenser onto field diaphragm (2) ... and while viewing through eyepiece... open or close field iris diaphragm (2) and center it to the outer periphery of the eyepiece field of view by means of field diaphragm

centering screws (4) . Set microscope condenser aperture diaphragm to desired contrast.

Steps 4 and 5 should be repeated when critical settings are desired for higher power objectives.

B. TO SUBSTITUTE 404 BUILT-IN BASE ILLUMINATOR FOR PLAIN BASE OF MICROSTAR SERIES 2 and 6

1. Remove lamp centering screws (3)
2. Loosen lamp-base-holding screws (5) and remove lamp assembly
3. Remove four (4) Allen Head Screws which hold plain base to arm
4. Substitute 404 Base and secure with replacement screws
5. Re-insert lamp and secure lamp-base-holding screws (5)
6. Re-insert centering screws (3) and follow instructions covered in Section A, steps 1 through 5

C. TO INSERT OR REPLACE BULB

1. Remove lamp centering screws (3)
2. Loosen lamp-base-holding screws (5) and remove lamp assembly
3. Inspect or replace bulb
4. If bulb must be replaced, use same type bulb and follow instructions covered in Section B, Steps 5 and 6

Do not use a bulb to complete exhaustion. Change it when it begins to blacken...otherwise faithful color rendition in color photomicrography is jeopardized.

D. TO CLEAN OPTICAL PARTS

Use camel's hair brush, lens paper or soft, clean lint-free cloth...smudges can be removed with clean alcohol or other suitable solvent. The mirror, located at the bottom of the light well, is a first-surface mirror and must be cleaned with a fine camel's hair brush...not with a cloth or lens paper. Residual dust can be removed with a blow bulb or small ear syringe.

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PRICE LIST

AO Spencer MICROSTAR MICROSCOPES and Accessories

BROCHURE SB124-Rev. 1259 EFFECTIVE December 15, 1959

Page No.	Catalog Number	Unit Net Price Quantity 1 - 4	Unit Net Price Quantity 5 or More
	Series E1 and 1		
11	E1MS-D1	$253.50	$228.15
	UE1MS-D1	252.50	227.25
	E1MS-D2	261.50	235.35
	E1MS-DB1	282.50	254.25
	1MS-D1	274.00	246.60
	1MS-D2	282.00	253.80
	1MS-DA1	303.00	272.70
	U1MS-DB2	310.00	279.00
	1MS-H1	345.50	310.95
	N1MF-H1	360.00	324.00
	N1MS-H1	349.00	314.10
	1MS-H2	353.50	318.15
	U1MS-H2	352.50	317.25
	Series 2		
13	2MS-DA1	321.00	288.90
	U2MS-DB1	320.00	288.00
	2MS-H1	363.50	327.15
	2MU-H2	421.50	379.35
	N2MU-H1	417.00	375.30
	X2MU-HA1	448.00	403.20
	N2MF-HAW	414.50	373.05
	N2MU-HBW	453.50	408.15
	2BS-H1	571.00	513.90
	2BU-H2	638.00	574.20
	2BU-HW	639.00	575.10
	N2BU-HW	642.50	578.25
	X2BF-HBW	634.50	571.05
	X2BU-HAW	673.50	606.15
	N2BG-HB1	670.00	603.00
	2TU-H2	678.00	610.20
	X2TU-HBW	713.50	642.15
	Series 4		
15	4BU-H1	701.00	630.90
	4BU-HW	719.00	647.10
	X4BS-HAW	703.50	633.15
	X4BF-HAW	714.50	643.05
	X4BU-HBW	753.50	678.15
	X4BG-HA2	770.50	693.45
	4TU-H2	758.00	682.20
	4TU-HW	759.00	683.10
	X4TS-HAW	743.50	669.15
	X4TU-HBW	793.50	714.15
	X4TC-HAW	856.50	770.85
	X4TG-HA2	810.50	729.45
	X4TU-HAW	793.50	714.15
	X4TU-HBW	911.50	820.35
	w/635		
	Apostar		
17	2BC-APQ3	1508.00	1357.20
	2BG-APQ3	$1463.00	$1316.70
	2BG-APT2	1252.00	1126.80
	4BC-APQ3	1588.00	1429.20
	4BF-APT2	1275.00	1147.50
	4BG-APQ3	1543.00	1388.70
	2TC-APQ3	1548.00	1393.20
	2TG-APQ3	1503.00	1352.70
	2TG-APT2	1292.00	1162.80
	4TC-APQ3	1628.00	1465.20
	4TF-APT2	1315.00	1183.50
	4TG-APQ3	1583.00	1424.70
	Pathostar		
18	X2BS-HBW	623.50	561.15
	X2BU-HAW	673.50	606.15
	X2TU-HBW	713.50	642.15
	N2BF-HBW	631.00	567.90
	X4BS-HBW	703.50	633.15
	X4BU-HBW	753.50	678.15
	X4TU-HAW	793.50	714.15
	X4TC-HAW	856.50	770.85
	Bacteria Count Bactistar		
19	2MU-YZ	367.50	330.75
	2BU-Z	559.00	503.10
	2BU-HYZ	664.00	597.60
	4BU-HYZ	744.00	669.60
	Mold Count Bactistar		
	2MU-MC1	332.00	298.80
	2MU-MC2	379.00	341.10
	2BU-MC3	700.00	630.00
	4BU-MC3	780.00	702.00
	Eyepieces		
20	C133	8.00	7.20
	C142	8.00	7.20
	146	17.00	15.30
	147	17.00	15.30
	149	.35	.32
	C166	24.50	22.05
	C167	32.00	28.80
	C168	32.00	28.80
	C170	34.00	30.60
	435	29.50	26.55
	C1133	17.00	15.30
	C1142	17.00	15.30
	1146	35.00	31.50
	1147	35.00	31.50
	C1166	50.00	45.00
	C1167	65.00	58.50
	C1168	65.00	58.50
	C1170	69.00	62.10

Page No.	Catalog Number	Unit Net Price Quantity 1 - 4	Unit Net Price Quantity 5 or More
	Counting and Measuring Accessories		
	148*	$ .80	$ .72
	400	21.50	19.35
	405	7.00	6.30
	410	7.00	6.30
	413	14.00	12.60
	416	14.00	12.60
	417	17.00	15.30
	C420	23.00	20.70
	422	13.00	11.70
	425	103.00	92.70
	427	8.00	7.20
	436	37.50	33.75
	469*	.50	.45
	1405A	7.00	6.30
	1406A	8.00	7.20
	1407A	8.00	7.20
	1408A	13.00	11.70
	1409A	13.00	11.70
	1410A	7.00	6.30
	1421A	13.00	11.70
	1427	8.00	7.20
	Objectives		
21	C105	24.50	22.05
	C107	24.50	22.05
	C109	24.50	22.05
	C110	27.00	24.30
	C112	35.00	31.50
	C115	39.00	35.10
	C125	60.00	54.00
	C127	67.00	60.30
	C150	94.00	84.60
	C152	139.00	125.10
	C154	177.00	159.30
	C158	278.00	250.20
	C159	326.00	293.40
	C1292	94.00	84.60
	Bodies		
	74A	27.00	24.30
	74B	21.50	19.35
	74F	21.50	19.35
	94	$220.00	$198.00
	96	260.00	234.00
	1092 Net	107.00	107.00
	1094	245.00	220.50
	1096	285.00	256.50
	1099	325.00	292.50
	Nosepieces		
	251	5.00	4.50
	252	17.00	15.30

Page No.	Catalog Number	Unit Net Price Quantity 1 - 4	Unit Net Price Quantity 5 or More
	253	$ 21.50	$ 19.35
	254	24.50	22.05
	Stages		
22	1526	16.00	14.40
	1529	16.00	14.40
	1536	107.00	96.30
	1537	129.00	116.10
	1547	27.00	24.30
	1549	27.00	24.30
	1561	66.00	59.40
	1562	66.00	59.40
	1563	66.00	59.40
	1564	66.00	59.40
	1565	84.00	75.60
	1566	84.00	75.60
	Condensers and Condenser Mounts		
	231A	7.00	6.30
	C232	17.00	15.30
	C233	17.00	15.30
	C234	24.00	21.60
	C235	90.00	81.00
	C236	90.00	81.00
	243	10.50	9.45
	244	34.00	30.60
	248	3.50	3.15
	Bases, Mirrors, Mirror Forks		
	188	1.50	1.35
	192	8.00	7.20
	193	1.50	1.35
	201	10.50	9.45
	404	100.00	90.00
	Dark Field Illuminators, Transformer		
23	214F	72.00	64.80
	218F	113.00	101.70
	350	19.00	17.10
	Cabinets		
	1602	24.50	22.05
	1604	24.50	22.05
	1612	29.50	26.55
	Illuminators		
	370A	67.00	60.30
	600	165.00	148.50
	609B	6.00	5.40
	610B	10.50	9.45
	612B	13.00	11.70
	618B	8.50	7.65
	735C	92.00	82.80
	Cameras		
	635	118.00	106.20
	682B	357.70	321.93

*ERRATA: Illustration captions for 148 and 469 at bottom of page 20 are transposed.

All prices, deliveries and terms of sale are subject to change without notice.

Applicable taxes are in addition to prices stated.

Orders are subject to final acceptance by the Sales Office at Buffalo with the understanding that prices and terms prevailing at time of delivery will apply.

The equipment supplied may not agree in all details with the descriptions or illustrations as instruments are subject to modification and revision.