

BALPLAN incident light microscopes

- For the Precise Observation of Opaque or Transparent Specimens
- BALPLAN Microscope Modularity Gives You a Real Choice
- High Power Magnification, 25X to 1500X

BALPLAN Incident Light Microscopes optimize operator performance in production, inspection, quality control and research/development in Electronics, Metals, Petroleum, Plastics and Ceramics—wherever incident light illumination is required for investigation of opaque, reflective specimens.

The BALPLAN Microscope's six modes of incident illumination (Bright Field, Dark Field, Differential Interference Contrast, Oblique, Polarized Light, Sensitive Tint), plus transmitted illumination, can be easily changed to meet a wide variety of viewing requirements. *Only one set of objectives is used for all illumination modes.* A choice of Tungsten or Tungsten-Halogen light sources adds greater range to observations under each type of illumination.

Image Excellence

Look into a BALPLAN Modular Microscope. Contrast, resolution and color correction are the best obtainable. The image is brighter, crisper—it virtually pops out at you. Planachromatic objectives let you see more of your specimen with edge-to-edge clarity. The field of view is 8mm to .13mm wide, and you see all of it, with no image drop-off. High power work is easier because the image remains steady. The exclusive suspended inner arm provides positive stability. The image cannot shift.

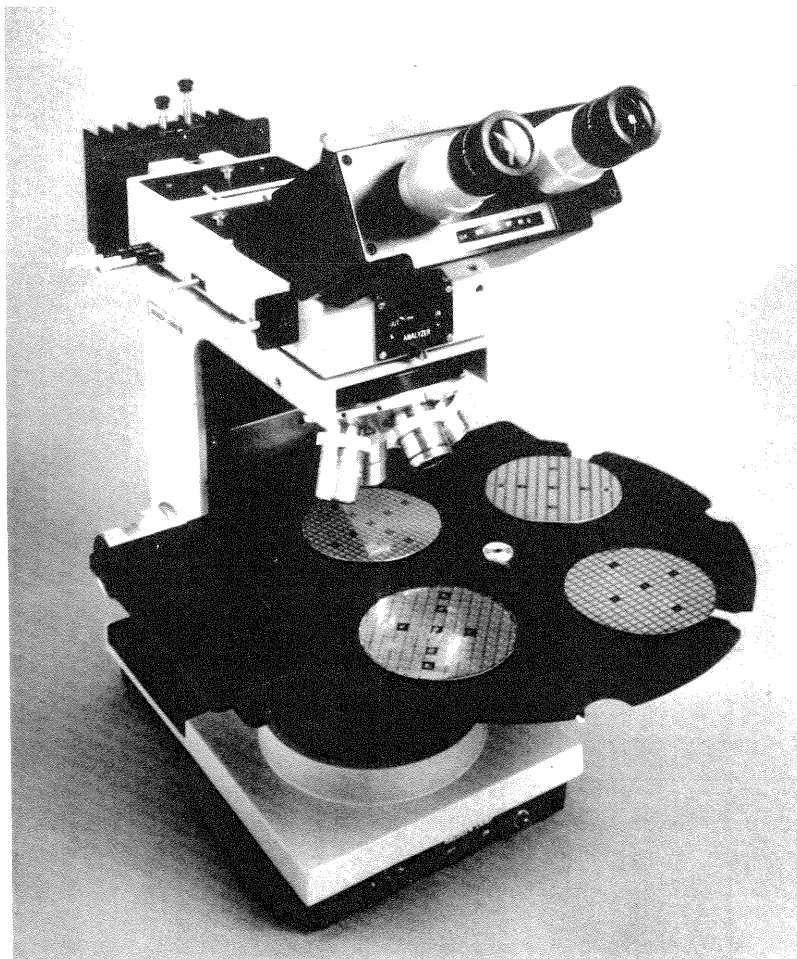
Modularity Plus

BALPLAN Microscopes are modular in design. There is a wide assortment of precisely engi-

neered, interchangeable heads, eyepieces, nosepieces, objectives, stages, condensers, illuminators and accessories.

Modularity means that you can custom design a model exactly fitted to your precise needs for today's requirements, then expand it as needed to meet the challenges of tomorrow.

BALPLAN Microscopes are also available in Bright Field, Phase Contrast, Incident and Transmitted Fluorescence, and Conference models for applications ranging from air and water pollution studies to petrochemical and pharmaceutical research activities.



BALPLAN incident light microscopes

Incident Light Microscope Illumination

Bright Field

Most common and simplest illumination with a bright positive image. Commonly used in all forms of inspection.

Dark Field

Creates a negative, high contrast image. Eliminates washout caused by excessive light from highly polished specimens. Excellent for inspection of alloys, silicon wafers and ceramics.

Differential Interference Contrast (DIC)

Shows topography and surface characteristics of metals, thin films, semi-conductors, photo-masks, etc. For more information on DIC, request brochure S-756.

Oblique Lighting

Used to examine surface imperfections of opaque specimens with the rotation of a simple optical wedge.

Polarized Light

Optical activity of minerals, chemicals, and textiles are easily identified under polarized light. A centering nosepiece and 100W Tungsten-Halogen illuminator are recommended.

Sensitive Tint

Adding the Sensitive Tint Plate to the Polarized Light system increases definition of metallurgical specimens, such as ductile cast iron and anodized aluminum.

Simultaneous Incident and Transmitted Light Microscope Illumination

Addition of an in-base, high-intensity, transmitted light illuminator permits the user to view specimens under a variety of illumination conditions, independently or in combination.

Recommended Models

The models and accessories shown here are typical. Please see the Model Makers on pages 39-43 for a complete list of all available components and accessories.

Electronics Production

MODEL NO.	DESCRIPTION
MBBA3AX (120 V)	Special Bright Field/Dark Field vertical illuminator, 4" x 5" mechanical stage —Binoc head, 4 BF/DF objectives, 10X w.f. eyepieces.

MEBA3DX for 240V

Quality Control

MRTA3AZ (120 V)	Deluxe Bright Field/Dark Field vertical illuminator, D.I.C., trioc head, plain stage with ungraduated mechanical stage, 4 BF/DF objectives, 10X w.f. eyepieces.
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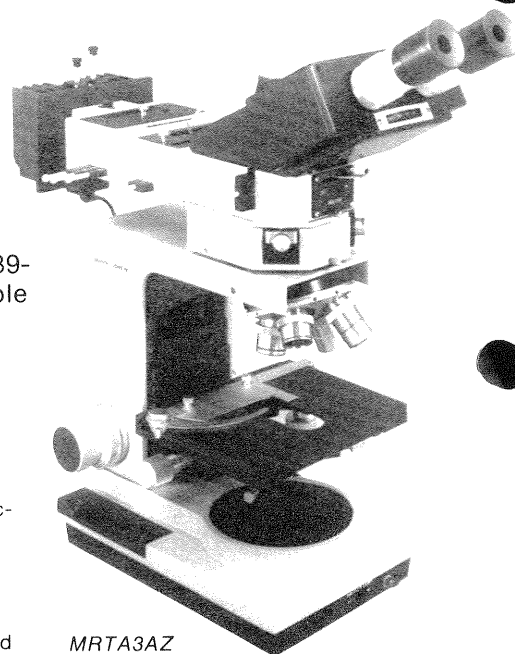
MRTA3DZ for 240V

Metals Industry

Bright Field/Dark Field/Polarized Light Applications

MBTA3AW (120 V)	Deluxe Bright Field/Dark Field vertical illuminator, 4" x 5" stage with trioc head, 4 BF/DF objectives, polarizer, analyzer.
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MBTA3DW for 240V



MRTA3AZ

Bright Field/DIC Applications

MBTA3AZ (120 V)	Standard Bright Field Vertical Illuminator, 4" x 5" stage, trioc head, 4 BF/DF objectives, D.I.C.
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MBTA3DZ for 240V

Research/Development

MBTA3CZ (120 V)	Deluxe Bright Field/Dark Field Vertical Illuminator with T/H lamp, 4" x 5" stage, trioc head, D.I.C. 4 BF/DF objectives.
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MBTA3EZ for 240V

BALPLAN incident light microscopes

Incident Light Microscope Components

Stand

Innovative in design, the BALPLAN Stand is uniquely adapted to its function. Vibration-free viewing and photomicrography are now possible with the exclusive, suspended inner arm construction. Only the nosepiece and objectives are supported independently by the inner arm and are isolated from any shock or weight sustained by the outer arm. The additional weight of accessories, such as vertical illuminator, the DIC module, cameras and multiple heads is borne by the outer arm and will not affect focus.

To eliminate the usual jumble of wires common on most microscopes, the back of the arm of all BALPLAN Incident Light Microscopes contains the necessary wiring harness and convenient outlets for the Tungsten vertical illuminators and multiple viewing adapter.

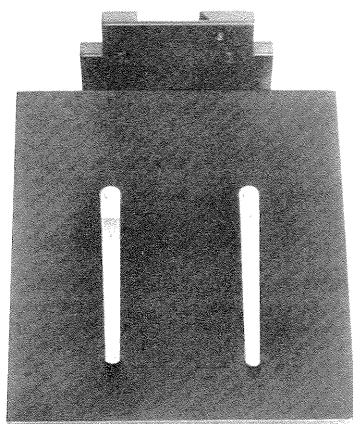
For utmost convenience, the base of the microscope contains a built-in transformer with rheostat for intensity control of the tungsten lamphouse. The Tungsten-Halogen lamphouse requires an external power supply. A recessed plug is provided in the base for the removable 3-wire power cord (120V units).

The ultimate in focusing accuracy is provided by the low position coaxial focusing mechanism. One revolution of the fine adjustment knob, calibrated in one micron graduations, moves the stage vertically 100 microns. A focusing range of 2 inches offers adequate clearance for virtually all types of specimen.

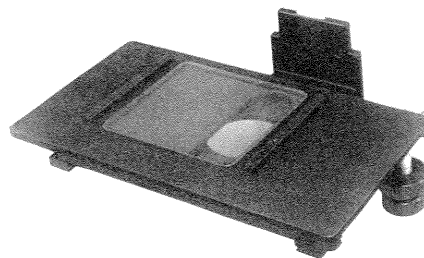
Stages

Whether you are right-handed or left-handed, there's an interchangeable BALPLAN Stage to suit almost any specimen handling situation.

- 31-60-27 Plain Stage
A low cost stage designed to handle large reflective specimens. Has no aperture. Can accept attachable graduated and ungraduated mechanical stages.



- 31-60-(43 or 45) Graduated Mechanical Stages
left-hand and right-hand models for transmitted and reflected light applications.
- 31-60-(42 or 44) Ungraduated Mechanical Stages
Left-hand and right-hand models for transmitted and reflected light applications.
- 31-60-30 4" X 5" Ungraduated Mechanical Stage—Right Hand
Transparent glass, platform-type (moves 4" in X-direction, 5" Y-direction) stage for the examination of wafers and masks. Stage has dovetails for mask and wafer paddles. No substage condenser.



- 31-60-31 4" X 5" Ungraduated Mechanical Stage—Left Hand
- 31-60-32 4" X 5" Ungraduated Mechanical Stage—Right Hand
Same as above except with rack and pinion substage condenser.
- 31-60-33 4" X 5" Ungraduated Mechanical Stage—Left Hand
Same as 31-60-32
- 31-60-37 3" X 3" Mask Paddle
- 31-60-38 4" X 4" Mask Paddle
- 31-60-39 3" Wafer Paddle
- 31-60-40 2" and 3" Lazy Susan
Wafer Paddle
Easily attaches to 4" X 5" stage. Can handle up to four wafers at the same time for faster inspections.
- 31-60-41 3" and 4" Lazy Susan
Wafer Paddle

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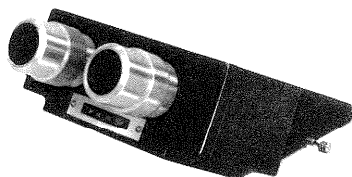
Heads

Heads are available in two configurations: binocular and triocular. All heads have eyepiece tubes inclined 30° from the horizontal for comfortable, fatigue-free viewing by the average person.

For photomicrography, either of the 2 triocular heads will accept Bausch & Lomb integrated cameras, AX-1™ Automatic Exposure Controller and most other 35mm SLR cameras with appropriate microscope adapters.

All heads are interchangeable and rotatable 360° on the outer arm of the stand. The left eyepiece tube is focusable to compensate for visual acuity. The interpupillary distance is easily adjustable with a calibrated dial, reading directly in millimeters.

- 31-18-77 Binocular Head, Inclined 30°
- 31-18-79 Triocular Head, Inclined 30°
- 31-18-14 Triocular Head, Inclined 30°, 50/50 Split



Eyepieces

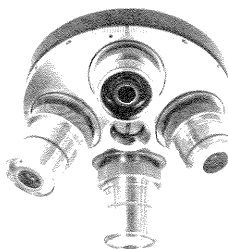
Eyepieces provide extra wide fields of view in magnifications of 10X and 15X. With the 10X eyepiece, the usable field of view is 20mm in diameter. Newly designed eyeguards effectively mask out stray light.

- 31-15-61-02 10X Wide-Field Eyepieces with Removable Eyeguards. Pair.
- 31-15-62-02 15X Wide-Field Eyepieces. Pair.
- 31-15-69-02 10X Wide-Field Eyepieces with Removable Eyeguards. Pair. (For use with Multiple-Viewing Models.)

Objectives

BALPLAN Planachromatic Objectives made with advanced computer-designed optical glass and improved vacuum coatings produce maximum resolution and true color rendition necessary for accurate microscopic analyses. They produce images that are flatter and wider from center to edge in all modes of illumination.

All BALPLAN Objectives are parfocal so you stay in focus when rotating from one objective to another. Only one set of objectives is needed for all types of incident illumination.



Nosepieces

BALPLAN Nosepieces are quickly interchangeable. The modular BALPLAN Microscope system provides a choice of two bright field nosepieces and three dark field nosepieces. Whenever polarized light or DIC applications are employed, the centerable

type nosepieces are recommended.

Nosepiece/objective assemblies are reversible for increased stage working area. A 31-18-71 Nosepiece Adapter is included to reverse the quad-centerable and quintuple nosepieces from the conventional orientation. When the 31-18-71 Adapter is used, the 31-15-69-02 eyepieces are recommended.

The following nosepiece/objective assemblies are available for the BALPLAN Incident Light Microscope:

CATALOG NO.	OBJECTIVES
31-18-69-23	5X, 10X, 20X, 40X
31-18-80-31	5X, 10X, 40X
31-18-80-32	10X, 20X, 40X

**Centerable Nosepiece and Rotating Stage are recommended to obtain performance in polarized light and DIC applications.*

Planachromatic Objectives Available For The BALPLAN Incident Light Microscope

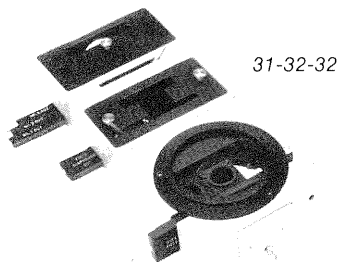
MAG. POWER	BRIGHT FIELD	DARK FIELD	POLARIZED	DIC	SENSITIVE TINT	OBLIQUE	NA	CATALOG NO.
2.5X	X		X		X	X	.0625	31-12-20
5X	X	X	X	X	X	X	.10	31-13-61
10X	X	X	X	X	X	X	.28	31-13-62
20X	X	X	X	X	X	X	.40	31-13-63
40X	X	X	X	X	X	X	.65	31-13-64
100X OIL	X		X	X	X	X	1.25	31-13-56

BALPLAN incident light microscopes

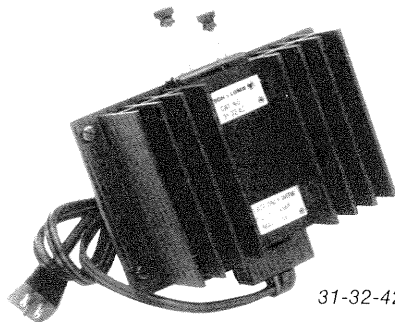
Vertical Illuminators

Bausch & Lomb offers one Vertical Illuminator for varying applications and economy. BALPLAN Deluxe Illuminator is designed for convenience and simplicity of use.

- 31-32-32 **Deluxe Vertical Illuminator**
The ultimate in versatility. Allows all six modes of illumination to be employed: BF, DF, DIC, Oblique, Polarized Light and Sensitive Tint. Includes a bright field/dark field prism slider, three sliding filter holders, a fixed field diaphragm, adjustable aperture diaphragm and a magnetized accessory holder. Accepts an adjustable field diaphragm (31-32-77) if required. Either the 20 watt Tungsten or the 100 watt Tungsten-Halogen lamphouses can be used.



31-32-32



31-32-42

Lamphouses for Vertical Illuminator

- 31-32-42 **20 Watt Tungsten-Halogen Lamphouse**
The Tungsten Lamphouse provides undiffused illumination for maximum intensity when viewing in all modes of illumination. The filament is focusable and centerable. The lamphouse connects directly to the wire harness in the arm of the microscope. It is powered by the BALPLAN Transformer Base with rheostat intensity control

- 31-32-57-01 **100 Watt Tungsten-Halogen Lamphouse/Power Supply**
(120 VAC)
240 VAC: 31-32-74-01
Designed for use with vertical illuminator when extremely high intensity illumination, such as polarized light or dark field, is required. The lamp is focusable and centerable. The power supply provides a voltage meter for maximizing lamp life.

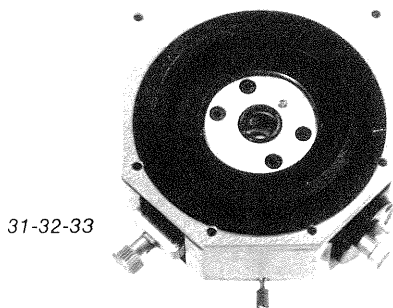
Tungsten-Halogen lamps offer long-life and constant intensity throughout its life with excellent performance in photomicrographic applications. Ideal for polarized light applications where light is at a premium.

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Additional Accessories For Incident Light Microscopes

31-32-33 DIC Accessory

The BALPLAN Differential Interference Contrast Accessory 31-32-33 can be used with all BALPLAN Incident Light Objectives (except the 2.5X). It features its own polarizer and quartz wedge. A macro adjustment enables the user to quickly slide through the color spectrum. The micro adjustment is used to fine tune the color image in the specimen for maximum three-dimensional effect. To evenly illuminate the field of view, a focusing mechanism for the quartz wedge is provided. The 31-57-83 Analyzer is required for use with the DIC module



31-32-33

Polarized Light Accessories

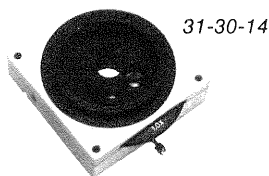
Polarized Light applications require the use of the rotatable Polarizer (42-34-57) which fits in a magnetic mount of all three vertical illuminators and an Analyzer (31-57-83) which fits in the front of the illuminator and can be flipped in and out of the optical path as needed.

Sensitive Tint Accessories

Sensitive Tint applications require the 42-34-57 Polarizer and 31-57-83 Analyzer, plus a Sensitive Tint Plate (31-35-22) which adds a first order red filter to the optical path. This plate is placed in the magnetic accessory mount just forward of the polarizer. Adding this accessory to the Polarized Light Accessory increases specimen definition.

ASTM Amplifier Attachment 31-30-14

A three aperture turret placed above the vertical illuminator provides 1X, 1.25X, and 1.5X magnifications enabling the metallurgist to obtain ASTM magnifications for both visual use and photomicrographic use.



31-30-14

Filters (3/4" (19mm) Diameter)

Neutral Density—For light intensity reduction without affecting the color balance (1.0 transmission: 31-16-23, 0.7 transmission: 31-16-24).

Green—For enhancing image contrast. Significantly improves contrast of black and white photomicrographs. (31-16-22).

Daylight Color Balancing—For daylight films (31-35-90).

Specimen Leveler 31-01-56

A unique but simple accessory which eliminates the need for an external specimen press. The specimen leveler can be placed in any aperture of the nosepiece. The mounted specimen is then placed on a small amount of putty (or similar material) on one of the three metal plates included with the Leveler. Using the focusing mechanism, the specimen is focused upwards until it becomes perpendicular to the optical system, thus maximizing flatness of field. It is designed to be parfocal with all other BALPLAN objectives.

Reticles

Bausch & Lomb offers a complete selection of wide field eyepiece reticles for metallurgy:

- 31-16-33 Graphite Flake Reticle (25X) for grain sizes 1-6 with 5X objective.
- 31-16-34 Graphite Flake Reticle (100X) for grain sizes 3-8 with the 10X objective.
- 31-16-35 Micrometer Scale for measurements to .001".
- 31-16-36 Dirt Count Reticle for classifying the inclusion content of steel—greatest length, average length, background rating—ASTM std. 45-607.
- 31-16-37 Intercept Length Reticle for accurate measurement of non-equi-axed grains.
- 31-16-38 Twinned Grain Size Reticle for comparing twinned grains in copper and copper base alloys.
- 31-16-49 Viewfinder Reticle allows perfect framing of all film formats for photomicrography.

Multiple Viewing Adapters

You can extend the versatility of your BALPLAN® Microscope System by the use of Multiple Viewing Adapters. Simultaneous viewing by two or more persons is simple and convenient. An illuminated pointer seen by all viewers can be moved anywhere in the field of view by means of a universal "joystick" control. The pointer unit has its own on/off switch and plugs into the rear of the microscope arm. It uses the internal transformer.

Photomicrography

See Photomicrography section for complete details.

Model maker for BALPLAN simultaneous & incident light microscope components

MODEL MAKER CODES

B&L CAT. NO.

Stands

MR	31-01-50-42
MS	31-01-50-37
ML	31-01-50-36
ME	31-01-50-63
MB	31-01-50-71
MC	31-01-50-73
MD	31-01-50-75
MM	31-01-50-35

Heads

B	31-18-77
T	31-18-79
N	31-18-85-18
Q	31-18-85-17
P	31-18-14

Eyepieces

A	31-15-61-02
B	31-15-62-02
C	31-15-69-02

MODEL MAKER CODES

B&L CAT. NO.

Nosepiece/Objective Assemblies

1	31-18-80-31
2	31-18-80-32
3	31-18-69-23

Vertical Illuminators

A	31-32-32-01 (120V)
D	31-32-32-09 (240V)
C	31-32-32-02 (120V)
E	31-32-32-10 (240V)


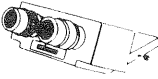

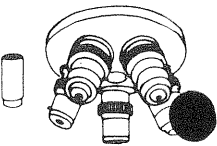
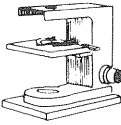
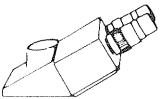
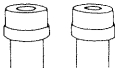
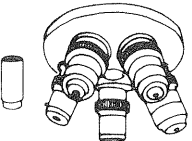

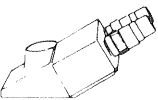

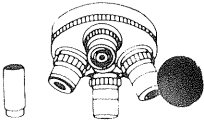



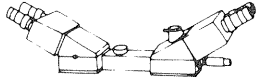
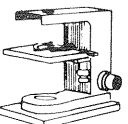
Vertical & Transmitted Illuminators

6	31-32-32-13 (120V)
R	31-32-32-11 (240V)
7	31-32-32-14 (120V)
S	31-32-32-12 (240V)

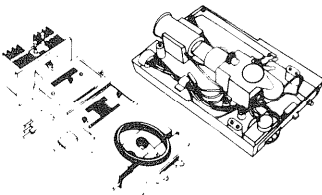
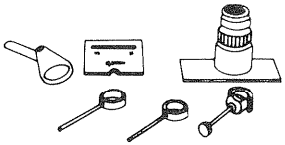
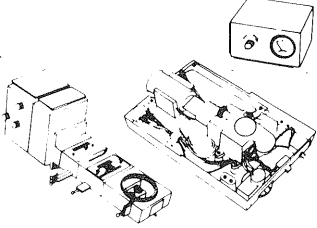
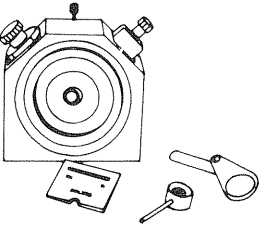
Accessories

W	31-57-83-02
Z	31-57-83-03
X	


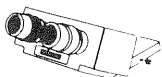

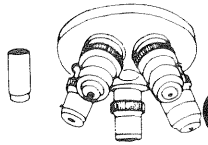
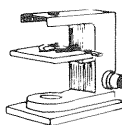
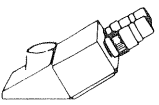

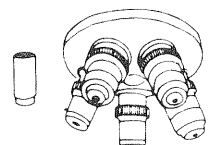
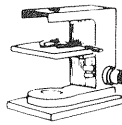
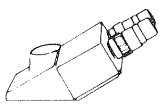

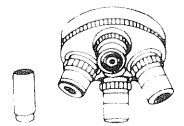
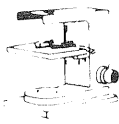
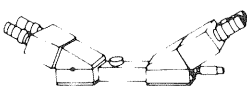
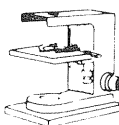
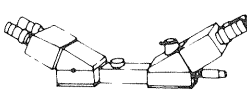
Model maker for BALPLAN incident light microscopes

Stands	Heads	Eyepieces (Pairs)	Nosepiece/ Objective Assemblies
MR 31-01-50-42 consisting of 31-01-50 Stand, 31-60-42 Right hand ungraduated mechanical stage 31-49-62 Dust cover 	B  31-18-77 Binocular	A*  31-15-61-02, 10X widefield pair, with 31-49-29 Eyeguards	1 For Bright Field/Dark Field S 31-18-80-31 Equipment consisting of: 31-18-80 Quintuple Nosepiece D.F. 31-13-61 5X B.F./D.F. 31-13-62 10X B.F./D.F. 31-13-64 40X B.F./D.F. (Select A or C Vertical Illuminator Column) 
ML 31-01-50-36 consisting of 31-01-50 Stand, 31-60-44 Left hand ungraduated mechanical stage 31-49-62 Dust cover 	T  31-18-79 Triocular	B*  31-15-62-02, 15X wide field pair with 31-49-29 Eyeguards	2 For Bright Field/Dark Field S 31-18-80-32 Equipment consisting of: 31-18-80 Quintuple Nosepiece D.F. 31-13-62 10X B.F./D.F. 31-13-63 20X B.F./D.F. 31-13-64 40X B.F./D.F. (Select A or C Vertical Illuminator Column) 
MS 31-01-50-37 consisting of 31-01-50 Stand, 31-60-43 Right hand ungraduated mechanical stage 31-49-62 Dust cover 	P  31-18-14 Photobinocular beam dividing head, 50/50 split	C*  31-15-69-02, 10X wide field pair. For use with N & Q in Head Column. (31-49-29 Eyeguards)	3 For Bright Field/Dark Field S 31-18-69-23 Equipment consisting of: 31-18-69 Quadruple Centerable Nosepiece D.F. 31-13-61 5X B.F./D.F. 31-13-62 10X B.F./D.F. 31-13-63 20X B.F./D.F. 31-13-64 40X B.F./D.F. (Select A or C Vertical Illuminator Column) 
ME 31-01-50-63 consisting of 31-01-50 Stand, 31-60-27 Plain Stage. No Aperture. 31-49-62 Dust cover 	N  31-18-85-18 Equipment consisting of: 31-18-85 Multiple Viewing Adapter with two 31-18-77 30° Binocular Heads (Select C or E in Vertical Illum. Column) Use eyepiece "C"	*For dual and multiple viewing models, double the price of the eyepiece chosen.	
MB 31-01-50-71 consisting of: 31-01-50 Stand 31-60-30 Stage 4" x 5" 31-49-62 Dust cover 	Q  31-18-85-17 Equipment consisting of: 31-18-85 Multiple Viewing Adapter with one 31-18-79 Triocular and one 31-18-77 Binocular Head. (Select C or E in Vert. Illum. Column) Use eyepiece "C"		
MC 31-01-50-73 consisting of: 31-01-50 Stand 31-60-30 Stage 4" x 5" 31-60-39 3" Wafer Paddle 31-49-62 Dust cover 			

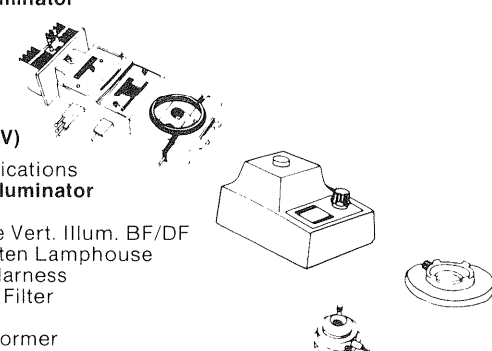
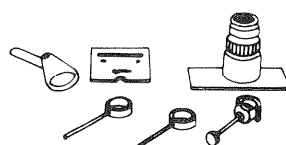
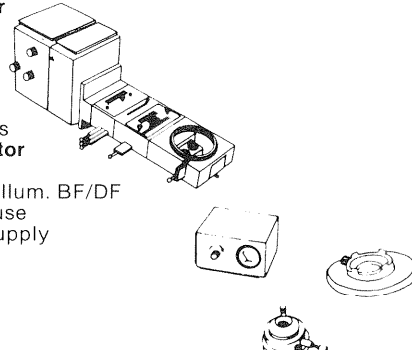
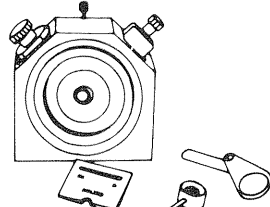
Model maker for BALPLAN incident light microscopes

Vertical Illuminators	Accessories*
<p>A (120V) For Bright Field/Dark Field S 31-32-32-01 Illuminator cons. of: 31-32-97 Wire Harness 31-32-32 Deluxe Vertical Illuminator for B.F./D.F. 31-32-42 20W Tungsten Lamphouse 31-16-22 Green Filter 31-32-43 Vertical Illuminator Base 31-01-55 Hole Cover 31-32-32-09 (240V)</p> 	<p>W For Polarized Light Sens. Tint Oblique 31-57-83-02 Analyzer assy. cons. of: 42-34-57 Polarizer 31-57-83 Analyzer 31-35-22 Sensitive Tint Plate 31-32-85 Oblique Light Accessory 31-01-56 Specimen Leveler</p> 
<p>C (120V) For Bright Field/Dark Field S 31-32-32-02 Illuminator cons. of: 31-32-32 Deluxe Vertical Illuminator for B.F./D.F. 31-32-61 T-H Lamphouse 31-32-57 100W T-H Power Supply & Lamp Assembly 31-32-41 Vertical Illuminator Adapter for 31-32-61 31-16-22 Green Filter 31-16-24 N.D. Filter 0.7 31-16-23 N.D. Filter 1.0 31-32-93 Wire Harness 31-32-43 Vertical Illuminator Base 31-01-55 Hole Cover 31-32-32-10 (240V)</p> 	<p>Z For DIC 31-57-83-03 Analyzer assy. cons. of: 31-57-83 Analyzer 31-32-33-02 DIC w case (31-40-85)</p> 
<p>E (240V)</p>	<p>X *If nothing desired in this column, use letter "X" as last digit of your model number</p> <p>How to Use This Model Maker</p> <p>You pick out the stand, head, eyepieces, nosepiece/objective assemblies, vertical illuminator, and accessories which will make up an instrument to satisfy your intended use. Write down the letters and numbers that indicate your choices. If there is a column in which no item is required, place an "X" in that column. You will now have a seven-digit, specialized model order number. For example: MBTA3AW or MRBA2AX. If you wish to change or substitute an item in any column place an "X" in that column and specify item wanted.</p>

Model maker for BALPLAN simultaneous transmitted/reflected light microscopes

Stands	Heads	Eyepieces (Pairs)	Nosepiece/ Objective Assemblies
MR 31-01-50-42 Equipment consisting of: 31-01-50 Stand. 31-60-42 Right hand ungraduated mechanical stage 	B  31-18-77 Binocular	A*  31-15-61-02, 10X widefield pair, with 31-49-29 Eyeguards	1 For Bright Field/Dark Field S 31-18-80-31 Equipment consisting of: 31-18-80 Quintuple Nosepiece D.F. 31-13-61 5X B.F./D.F. 31-13-62 10X B.F./D.F. 31-13-63 20X B.F./D.F. 31-13-64 40X B.F./D.F. (Select 6 or 7 in Vertical Illuminator Column) 
ML 31-01-50-36 Equipment consisting of: 31-01-50 Stand. 31-60-44 Left hand ungraduated mechanical stage 	T  31-18-79 Triocular	B*  31-15-62-02, 15X wide field pair with 31-49-29 Eyeguards	2 For Bright Field/Dark Field S 31-18-80-32 Equipment consisting of: 31-18-80 Quintuple Nosepiece D.F. 31-13-62 10X B.F./D.F. 31-13-63 20X B.F./D.F. 31-13-64 40X B.F./D.F. (Select 6 or 7 in Vertical Illuminator Column) 
MS 31-01-50-37 Equipment consisting of: 31-01-50 Stand. 31-60-43 Right hand graduated mechanical stage 	P  31-18-14 Photobinocular beam dividing head, 50/50 split	C*  31-15-69-02, 10X wide field pair. For use with N & Q in Head Column. (31-49-29) Eyeguards	3 For Bright Field/Dark Field S 31-18-69-23 Equipment consisting of: 31-18-69 Quadruple Centerable Nosepiece D.F. 31-13-61 5X B.F./D.F. 31-13-62 10X B.F./D.F. 31-13-63 20X B.F./D.F. 31-13-64 40X B.F./D.F. (Select 6 or 7 in Vertical Illuminator Column) 
MM 31-01-50-35 Equipment consisting of: 31-10-50 Stand. 31-60-45 Left hand graduated mechanical stage 	N  31-18-85-18 equipment consisting of: 31-18-85 Multiple Viewing Adapter with two 31-18-77 30° Binocular Heads (Select 7 or 5 in Vertical Illum. Column) Use Eyepiece "C".	*For dual and multiple viewing models, double the price of the eyepiece chosen.	
MD 31-01-50-75 Equipment consisting of: 31-01-50 Stand 31-60-30 R.H. Stage, 4" x 5" 31-60-38 4" Mask Paddle 	Q  31-18-85-17 equipment consisting of: 31-18-85 Multiple Viewing Adapter with one 31-18-79 Triocular and one 31-18-77 Binocular Head. (Select 7 or 5 in Vert. Illum. Column) Use Eyepiece "C".		

Model maker for BALPLAN simultaneous transmitted/reflected light microscopes

Vertical & Transmitted Illuminators	Accessories*
<p>6</p> <p>31-32-32-13 Illuminator (120V)</p> <p>or</p> <p>31-32-32-11 Illuminator (240V)</p> <p>For BF/DF Applications S 31-32-32-13 Illuminator consisting of: 31-32-32 Deluxe Vert. Illum. BF/DF 31-32-42 Tungsten Lamphouse 31-32-93 Wire Harness 31-16-22 Green Filter 31-32-16 HIBI 31-35-28 Transformer 31-55-32 LWD Phase Condenser</p> 	<p>W</p> <p>For Polarized Light. Sens. Tint/Oblique 31-57-83-02 Analyzer Assy. consisting of: 42-34-57 Polarizer 31-57-83 Analyzer 31-35-22 Sensitive Tint Plate 31-32-85 Oblique Light Accessory 31-01-56 Specimen Leveler</p> 
<p>7</p> <p>31-32-32-14 Illuminator (120V)</p> <p>or</p> <p>S 31-32-32-12 Illuminator (240V)</p> <p>For BF/DF Applications S 31-32-32-14 Illuminator consisting of: 31-32-32 Deluxe Vert. Illum. BF/DF 31-32-61 T-H Lamphouse 31-32-57 T-H Power Supply 31-32-41 Adapter 31-16-22 Green Filter 31-16-23 N.D. Filter 31-16-24 N.D. Filter 31-32-93 Wire Harness 31-32-16 HIBI 31-55-32 LWD Phase Condenser</p> 	<p>Z</p> <p>For DIC 31-57-83-03 Analyzer Assy. consisting of: 31-57-83 Analyzer 31-32-33-02 DIC w/case (31-40-85)</p> 
	<p>X</p> <p>*If nothing desired in this column, use letter "X" as last digit of your model number.</p> <p>How to Use This Model Maker</p> <p>You pick out the stand and stage, head, eyepieces, nosepiece/objective assemblies, vertical and transmitted illuminators, and the accessories which will make up an instrument to satisfy your intended use. Write down the letters and numbers that indicate your choices. If there is a column in which no item is required, place an "X" in that column. You will now have a seven-digit, specialized model order number. For example: MJTA37S or MRBA68X. If you wish to change or substitute an item in any column place an "X" in that column and specify item wanted.</p>