Nikon

# MULTIPHOT

# Nikon MULTIPHOT gives you wide-field, photography at low magnifications

## . . . and other photomacrographic and photomicrographic possibilities

Photomacrography has found important applications in medical and biological research, as well as in the electronic and machine tool industries. However, inherent limitations in lenses, equipment and even illumination sources have so far made photomacrographic work difficult and at best, imprecise.

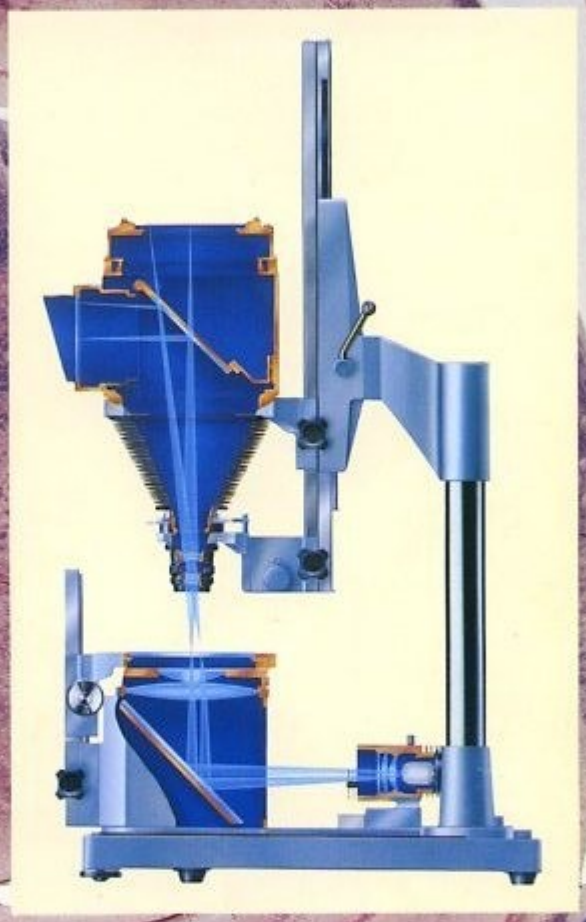
Now Nikon has solved all these problems with the MULTIPHOT. In the 4″ × 5″ format, for instance, the MULTIPHOT features a large bellows unit coupled to a vibration-damped, self-cocking shutter. The diascopic base, along with low-voltage focusing illuminator, provides uniform edge-to-edge illumination across the entire specimen plane. Clear, sharp, well-defined images can thus be easily recorded.

Other features include a bayonet mount which accepts a variety of adapter backs: Polaroid® 4″ × 5″ camera back for black-and-white or color film, 6cm × 9cm roll film camera back or 2-1/2″ × 3-1/2″ sheet film and photo plate holders.

In addition to plugging the gap that formerly existed between the magnification ranges of a conventional camera and those possible with a microscope, Nikon went one step farther. It created a system that would also handle your photomicrographic and copying requirements—precisely, thoroughly, professionally—in formats of from 35mm up to 4″ × 5″.

*Cross section of rabbit brain
Macro-Nikkor 120mm, f/6.3.
Magnification approx. 8X

# large-format

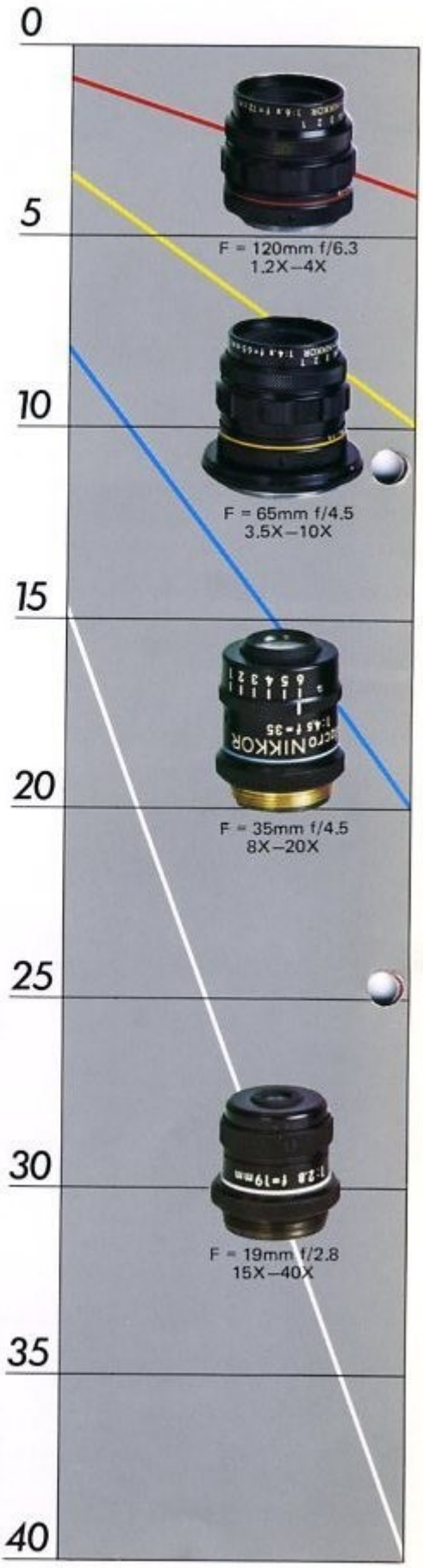


# Nikon technology makes the system work for you

### Four superb Macro-Nikkor lenses capture images sharply on film

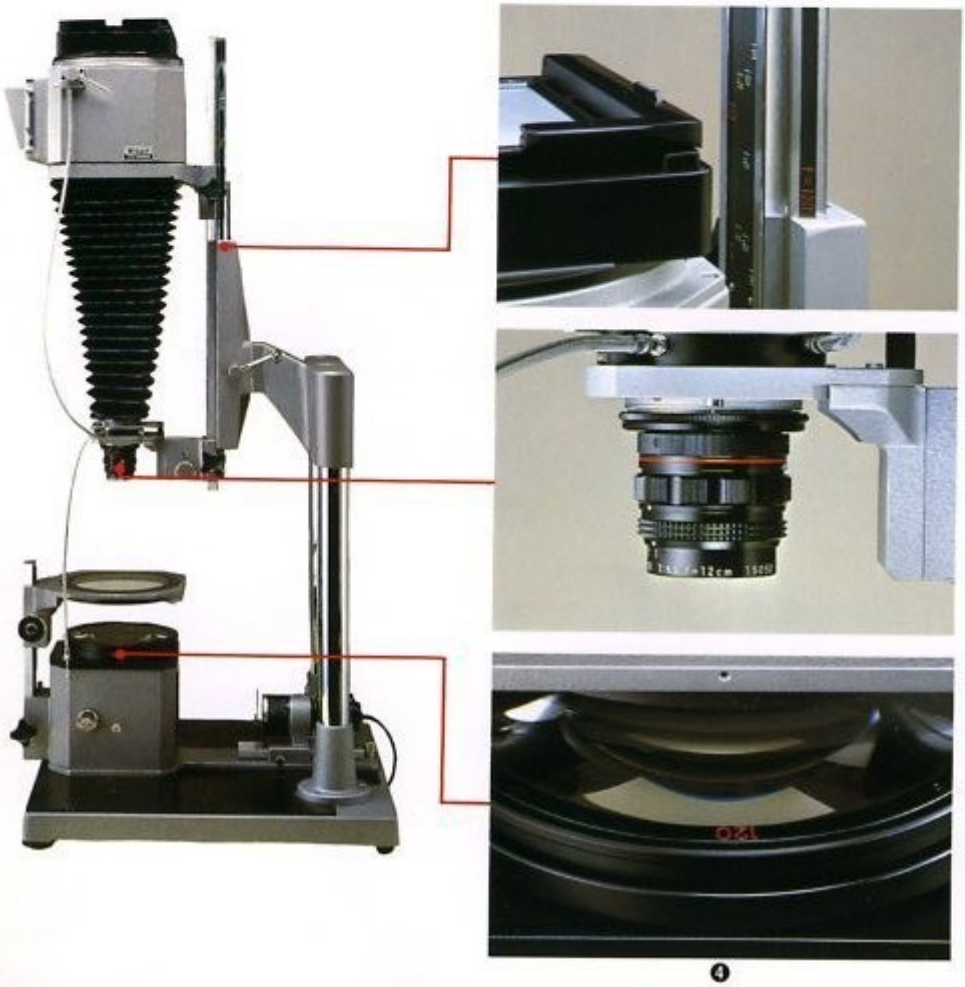
High-resolution Macro-Nikkor lenses produce critically sharp images of the most minute subject structures. You have a choice of four lenses depending on the magnification you require: 120mm f/6.3 or 65mm f/4.5 lenses with screw-in mount and 35mm f/4.5 or 19mm f/2.8 lenses with RMS microscope thread mount for higher magnification. Matching condenser lenses that fit into the diascopic illuminator unit are available for each of these lenses.






### Color coding makes illumination, magnification adjustments fast and simple

Illumination and magnification adjustments are always necessary after changing a lens or condenser. Nikon makes this chore easy. After first matching the color-coded rings on the Macro-Nikkor and condenser rings, you simply line up the top and bottom bellows standards with the same color-coded marks on the guide rail. Objective lenses, like the condenser mounts, use the following color-coded key: 120mm, red; 65mm, yellow; 35mm, light blue; and 19mm, white.



## Synchronized shutter and mirror switch lever facilitate change from viewing to shooting

When the mirror is switched from viewing to photographing by the mirror lever on the reflex housing, the shutter closes automatically. And when the mirror returns to the viewing position, the shutter reopens so that the specimen can be seen on the screen. This is all accomplished in one simple step. An interlocking cable release is included to prevent accidental shutter opening when the reflex mirror is not in the photographing position.

A light baffle in the reflex housing, which is synchronized with the mirror, closes the opening on the mirror housing back to permit sequence photography; the dark side of the film holder can be left open.

## Ruggedly built stand ensures stable, vibration-free operation

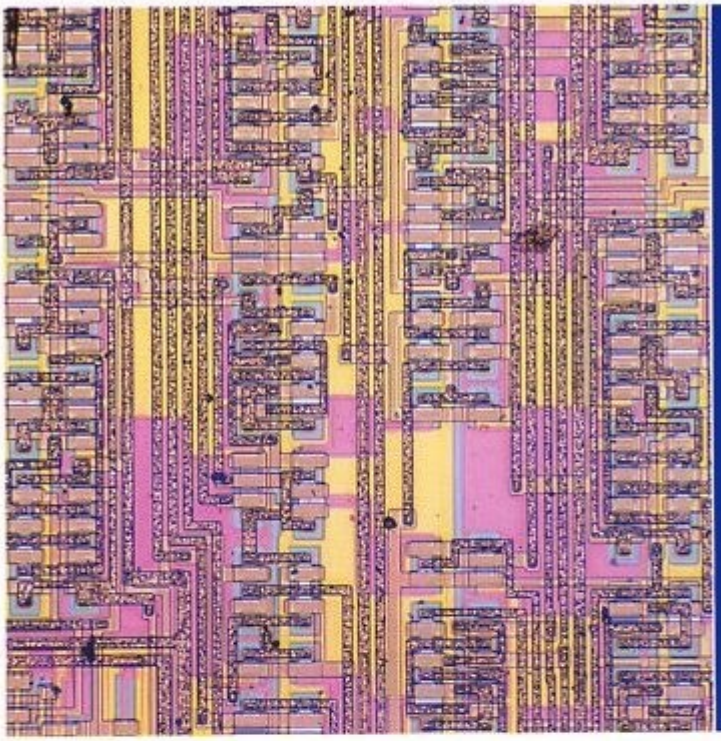
The MULTIPHOT's rigid and sturdy stand prevents vibrations from affecting your photographic operations. The massive baseplate (500mm x 500mm x 50mm) is covered with a rubber vibration-absorbing sheet, and two leveling screws are mounted in front to keep specimens on an even plane. Dual uprights provide maximum torsion resistance for the H-shaped guide rail, which can easily be raised and lowered through a 260mm span with a crank-operated rack and pinion. When fully extended, the guide rail height is 1100mm above the baseplate.

## Diascopic illuminator provides bright, even illumination with good contrast

Nikon's diascopic illuminator assembly provides even lighting and good contrast for transparent specimens up to 135mm in diameter. The built-in rotatable mirror also permits oblique and dark-field illumination. The attached 6V-30W light source has a focusing collector lens, while 120mm, 65mm, 35mm and 19mm corrected condensers are available to match the lens used. Rack and pinion gears precisely raise or lower the specimen platform. Complementing the built-in, continuously variable iris field diaphragm are 8 inlay field stops of different diameters.

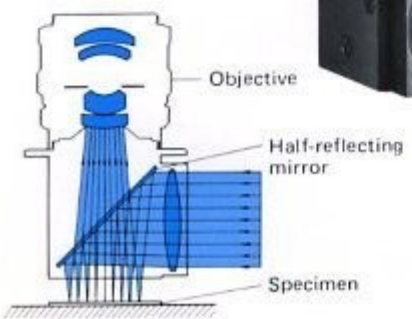
# Choose the episcopic illuminators to suit the lighting

Depending on the type of specimen, purpose, magnification and object-image distance, several episcopic illuminators for photomacrography are available. These include vertical on-axis illumination via a half mirror attachment, oblique illumination with flood or spot lamps, and diffused illumination with Lieberkuehn mirrors.



## Half mirror attachment

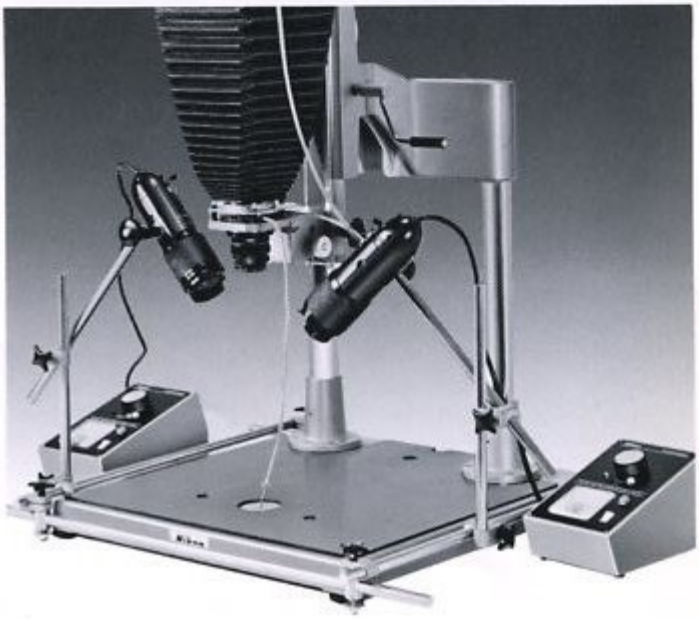
For shadowless on-axis illumination with highlights, Nikon makes a half mirror attachment for use with 35mm and 65mm lenses.


## Episcopic illuminator

At low magnification, a flood lamp fastened to the MULTIPHOT stand can be used to provide even illumination over a wide area, as the photo of a seashell illustrates above.

At high magnification, universal microscope lamps are most effective in setting up a crosslighting situation. One lamp on either side of the specimen will reveal natural highlights and shadows; flaws on metallic surfaces can be examined stereoscopically, and resolving power is enhanced by this improved lighting. Further, the universal lamp built into the MULTIPHOT diascopic illuminator can also be used to improve critical lighting situations.

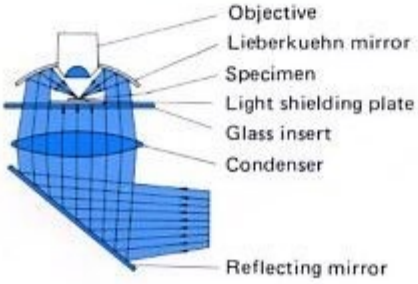


# situation

# MULTIPHOT configurations for every photographic requirement

### Lieberkuehn mirror

Bright shadowless lighting across the entire surface of a specimen is possible with the Lieberkuehn mirror, a concave mat-surfaced mirror with a central opening, which produces soft, diffused illumination. Two Lieberkuehn mirrors are available for use with the 65mm and 35mm lenses respectively.





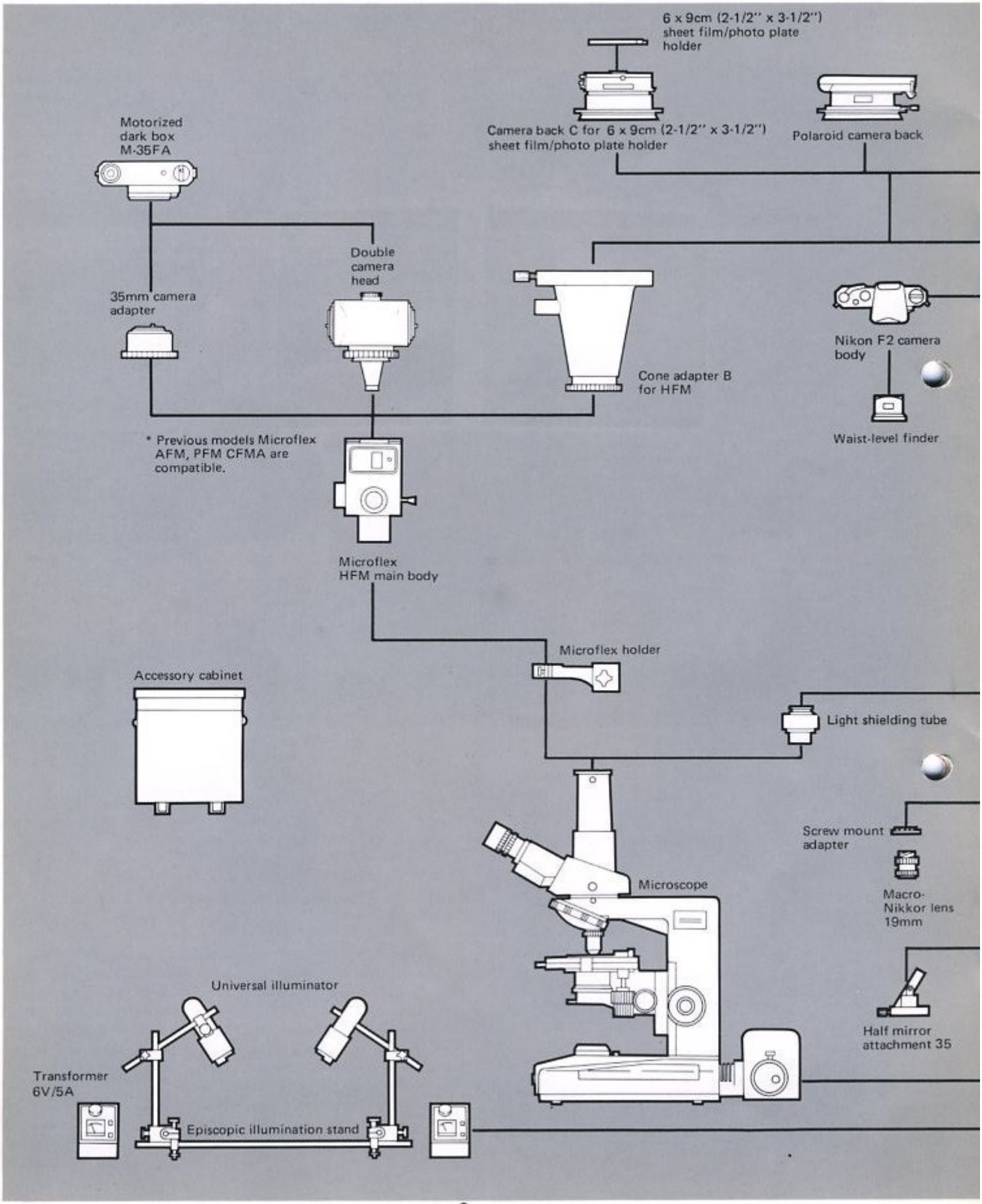
### Take photomacrographs with Nikon F2-series cameras, bellows and diascopic illuminator

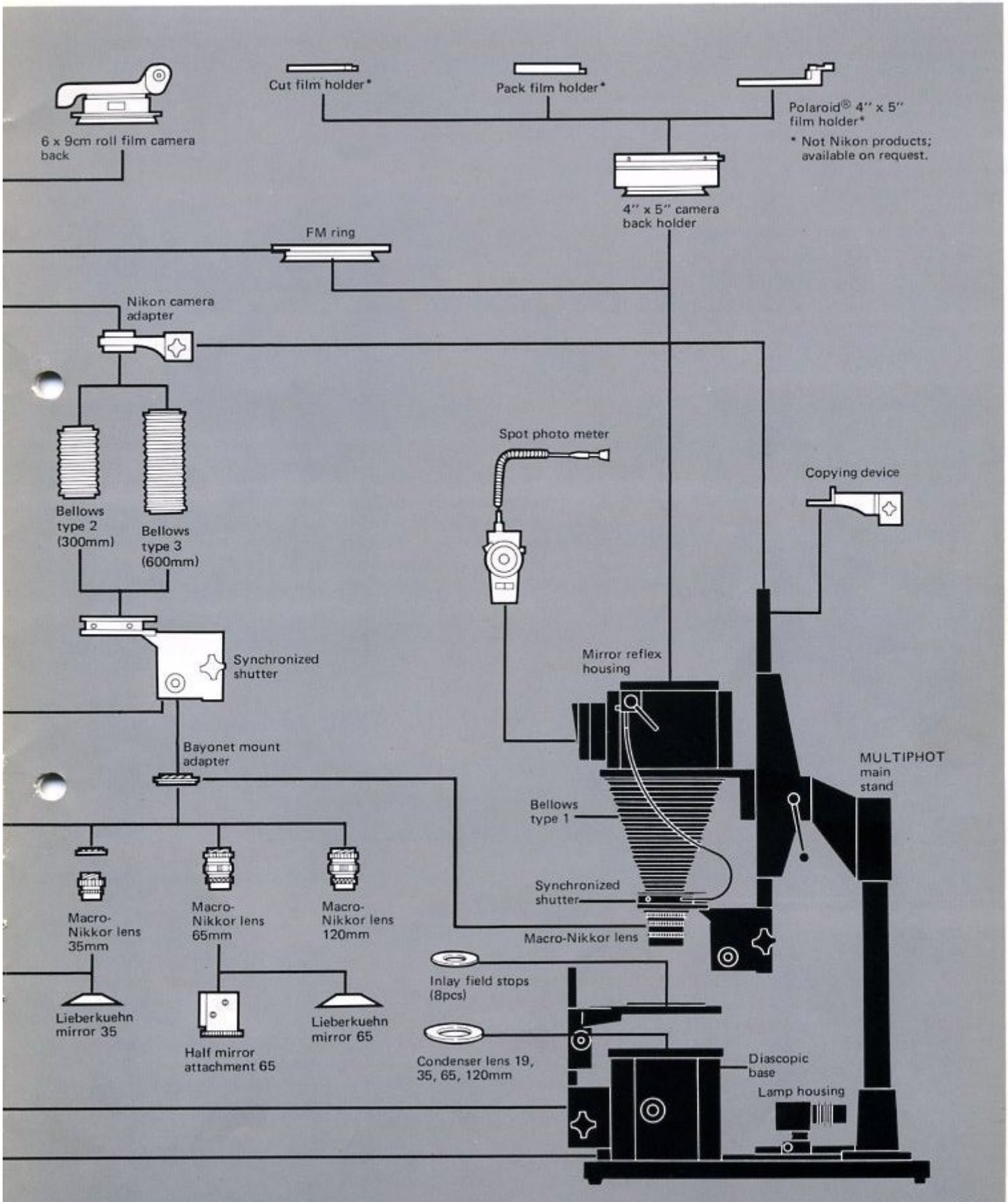
In the 35mm format, the Nikon F2 and other Nikon cameras are well matched for both photomacrography and photomicrography. The long 600mm bellows covers camera-to-shutter bracket distances down to 60mm, while the 300mm bellows goes down to 40mm. The choice of these two bellows depends on the magnification to be used.

### . . .Photomicrographs with a 4″ × 5″ bellows camera and a compound microscope

Large format, high-magnification photomicrographs are simple with a 4" x 5" bellows camera mounted on a microscope like the Nikon OPTIPHOT or LABOPHOT. Two light shields connect the lower microscope structure and upper photographic equipment without actual physical contact, thus eliminating vibration transmission. One shield fits bayonet-fashion around the shutter, while the other fits over the photo eyepiece of a trinocular tube's vertical member.

# System Diagram





# Large accessory lineup extends the MULTIPHOT's versatility

### Copying adapter performs a variety of tasks

The MULTIPHOT can be used as a copying stand. A convenient copying adapter fits any of the Nikon-series cameras into the proper position to reproduce documents, magazines or transparencies. In particular, transparencies can be reduced or enlarged—in whole or part—with the diascopic illuminator plus a camera body combined with various lenses and accessories. (Please refer to Nikon camera brochures for further information.)

### Spot photometer ensures precise exposure accuracy

This ultra-sensitive hand-held meter measures areas as small as 4mm in diameter. With the Nikon F2, exposures are read directly on the focusing screen of the waist-level finder. When the Nikon F2 Photomic is used, exposures are measured through the lens by the camera's built-in exposure meter.

**Area measured:** 4mm diameter circle
**Measuring range:** high 8 – 256 lux
low 0.0156 – 8 lux
**Film speed scale:** ASA 6 – 12000
(DIN 9 – 42)
**Shutter speed scale:** 30 min. – 1/4000 sec.
**Power source:** 1.3V mercury battery with battery checker

### Film holders enable varied formats

Film sizes from 35mm to 4" x 5" can be accommodated with various film holders such as the Toyoview,* Linhof * and Sinar,* as well as 6cm x 9cm (120) roll film and 2-1/2" x 3-1/2" sheet film holders and Polaroid® holders.

* Non-Nikon products

### Wooden accessory cabinet secures spare lenses

Nikon's sturdy wooden accessory cabinet is the perfect answer for safely carrying and storing extra Macro-Nikkor and condenser lenses, exposure meters and other needed accessories.

### 7X magnifier aids in precise focusing

Especially useful with the 4" x 5" format, the 7X magnifier simplifies exact focusing. You simply place the magnifier against the viewing screen and turn the fine focusing knob on the MULTIPHOT until the image snaps into sharp, clear focus.

### Filters control color balance

Preserve specimen contrast and balance artificial lighting for the film you use with Nikon filters such as the CB165, ND and green filters.

# Specifications

| | |
|---|---|
| **Stands** | Baseplate: Dimensions—500 x 500 x 50mm<br>Guide rail: Removable, supported by dual uprights, raises or lowers 260mm by means of a crank-operated rack and pinion. Height adjustable within a range of 840—1100mm. Used as a stand for photomicrography, cinemicrography, copying and close-ups besides photomacrography. Has a base for diascopic illumination and a high-power illuminator. |
| **Macro Lens** | Macro-Nikkor 120mm f/6.3: Magnification range 1/3X—4X (24 x 36mm format), standard screw mount.<br>Magnification range 1X—4X (4" x 5" format), standard screw mount.<br>Macro-Nikkor 65mm f/4.5: Magnification range 3.5X—10X (24 x 36mm and 4" x 5" formats), standard screw mount.<br>Macro-Nikkor 35mm f/4.5: Magnification range 8X—20X (24 x 36mm and 4" x 5" formats), RMS screw mount.<br>Macro-Nikkor 19mm f/2.8: Magnification range 15X—40X (24 x 36mm and 4" x 5" formats), RMS screw mount. |
| **Diascopic Illuminator** | 6V-30W tungsten lamp used. Provided with a focusing collector lens. Top component of the double system condenser interchangeable to match focal length lens for either of above photo-taking lenses.<br>Range of diascopic illumination area up to 135mm diameter. Provided with insert rings and variable iris field diaphragm. Attachable mechanical stage.<br>Oblique and dark-field illumination by means of mirror rotation. |
| **Condensers** | "120L" condenser: For 120mm lens; Magnification 0.5X—2X (24 x 36mm format)<br>"120" condenser: For 120mm lens; Magnification 1.2X—4X (24 x 36mm format)<br>"65" condenser: For 65mm lens; Magnification 3.5X—10X (24 x 36mm format)<br>"35" condenser: For 35mm lens; Magnification 8X—20X (24 x 36mm format)<br>"19" condenser: For 19mm lens; Magnification 15X—40X (24 x 36mm format) |
| **Shutter Reflex Housing** | No. 1 shutter, ever-set type, no shutter cocking necessary.<br>Speed: B—1/125 sec. with X-synch terminal.<br>Easy focusing and composing on large focusing ground glass screen.<br>Coupled shutter and mirror movement.<br>Perfect light baffling from film while viewing through finder as well as from finder while exposing.<br>Easily rotatable 180°.<br>Removable when not in use. |
| **Bellows** | For 4" x 5": Max. extension 600mm; Min. extension 60mm<br>For 35mm (1): Max. extension 300mm; Min. extension 40mm<br>For 35mm (2): Max. extension 600mm; Min. extension 60mm |
| **F-Mount Adapter** | For Nikon F2-series |
| **Accessories** | • Microflex holder<br>• Copying device<br>• Episcopic illuminator<br>• Stand<br>• Flood lamp<br>• Universal illuminator<br>• Lieberkuehn mirrors<br>• Half mirror attachments<br>• Spot photo meter<br>• Fitted accessory cabinet (dimensions: 318 x 323 x 213mm)<br>• 7X magnifier<br>• Filters CB165, ND 1/8X, green |

The equipment shown in this brochure represents the latest available at the time of this printing. Designs and specifications are subject to change without notice.

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