

A REVERSE-LENS SYSTEM FROM NIKON

Macrophotography Made Easy

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ALL PHOTOS BY AUTHORS

PHOTOGRAPHIC'S USER REPORT

Macrophotography beyond 1:1 magnification has always been a fascination of ours. Exploring the world of the small under a magnifying lens has allowed us to create a myriad of photos with bizarre color and intricate detail. For years, our attempts to capture these exciting scenes required considerable testing of equipment and films with little success. The biggest problem we encountered was the lack of proper equipment for this type of photography. Most of the setups that we tried were a hodgepodge of brackets and flash held together with baling wire.

Now there is something on the market that makes this type of photography a breeze. Nikon's reverse-lens system is not only easy to use, but is also designed around standard Nikon lenses you may already have in your arsenal. Here's how it works:

First, select a wide-angle lens. Choose a slower lens, because it won't disperse incoming light as much as a fast lens will. You won't be using the faster f-stops anyway. Select the lens that has the flattest front and rear elements. This type of lens will have less distortion in the final image. We found an old Nikon F 28mm f/3.5 lens with flat front and rear elements that provided excellent results.

The next step involves attaching the lens in a reverse position on the camera. We want to reverse the lens for a couple of reasons. First, as we increase the magnification with lenses in the normal position, we find the subject so close to the front of the lens that there is little or no room for the flash to properly light the subject. With the lens in the reverse position, the subjects are much farther from the lens, allowing better flash lighting. In order to achieve high magnification with the lens in the normal po-



sition, you will have to use a considerable amount of lens extension with extension tubes or bellows. With the lens in the reverse position, very little additional extension is necessary for very high magnification.

For example: If you used the 28mm wide-angle lens in the reverse position with no additional extension, you would already have a 2:1 magnification. This lack of additional extension cuts down on size and weight, a very important consideration when working in the field.

In order to maintain all the functions of a lens while in the reverse position, Nikon makes special adapters that attach to a variety of lenses. The first is called a BR-2A ring (52mm) or BR-5 (62mm), and is basically a very small metal ring with filter threads on one end and a Nikon bayonet mount on the other end. Screw the threaded end onto the front of the lens, turn the lens around, and use the new bayonet mount to attach it to the camera body.

For maximum magnification, try this setup: N8008 camera, PB-6 bellows, BR-2A reversing ring, reversed 24mm lens, BR-6 adapter, and SB-21 ring flash unit.

1. Dandelion was photographed at 2.25X magnification using a reversed 28mm lens on an N8008 body.

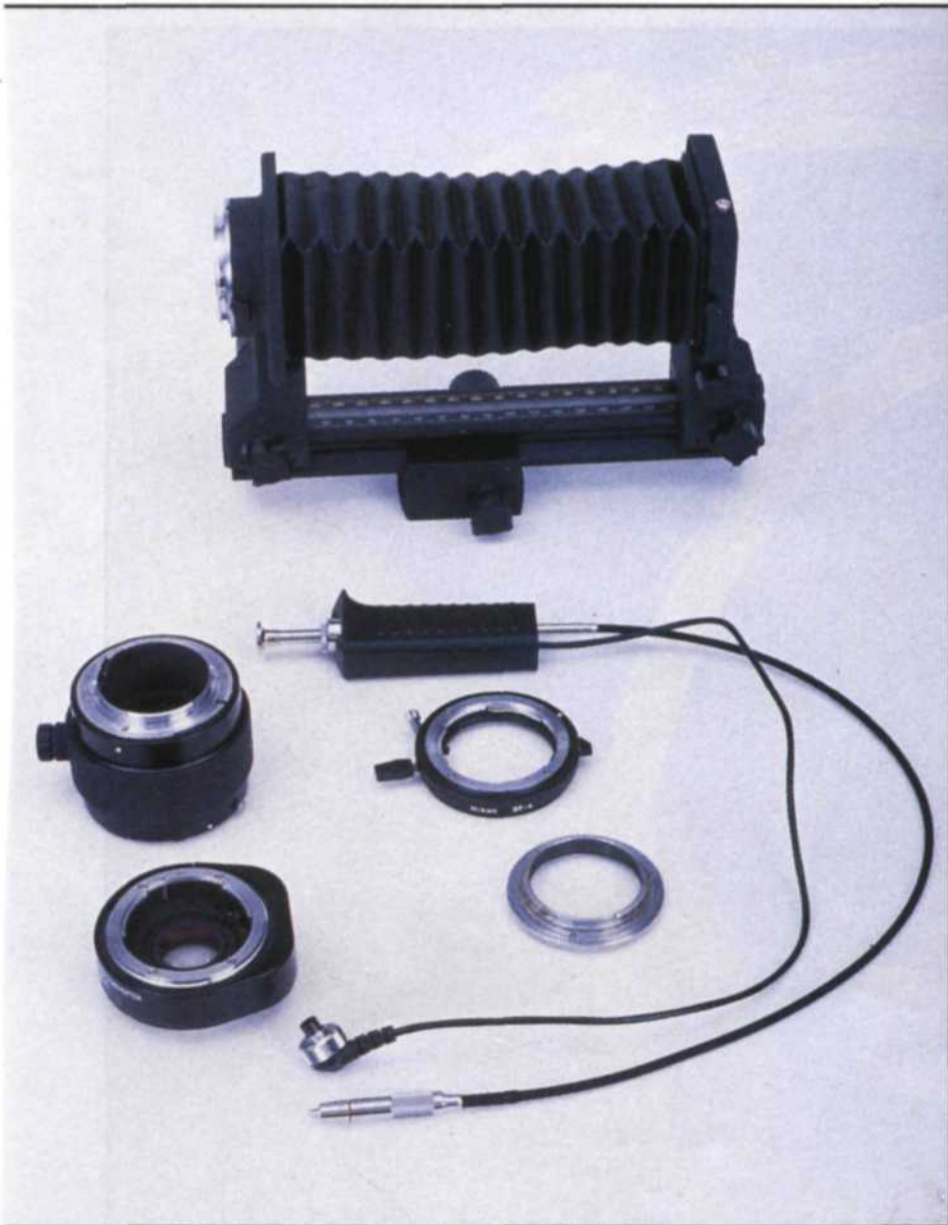
2. The equipment, clockwise from top: Nikon Bellows Attachment PB-6, Double Cable Release AR-10, Adapter Ring BR-6, Macro Adapter Ring BR-2A, Autofocus Converter TC-16A, and Auto Extension Ring PN-11.

3. Pollen, 2.25X magnification with reversed 28mm lens.

A Nikon BR-6 ring is then attached to the new front of the lens (its bayonet mount), to permit manual and automatic control of the aperture; plus it acts as a filter holder and lens hood. A small lever on the side of the BR-6 ring allows the photographer to manually close-down the aperture after correct focus is accomplished. This lever can be locked into the stopped-down position if you want full stop-down viewing.



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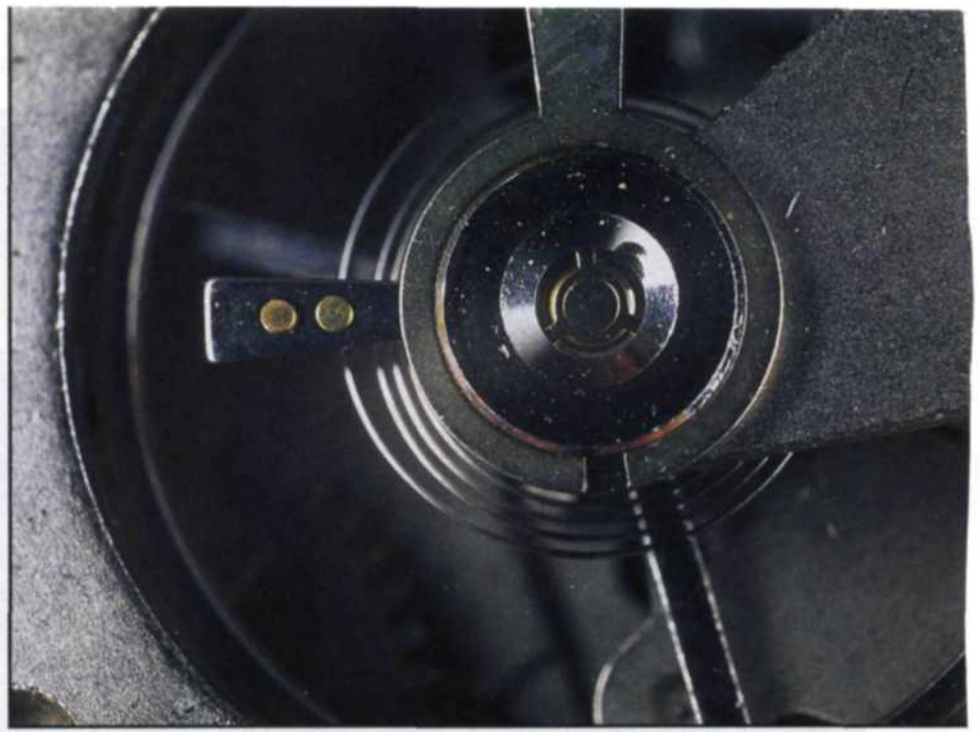
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For fully automatic operation, a special cable (AR-10) attaches to the BR-6 ring and the camera. When you depress the AR-10 release, two things happen: A mechanical plunger closes the aperture to the preset f-stop, then an electronic switch is closed and the camera is fired. With the two adapter rings and the AR-10 cable attached to the lens, you have essentially created a new high-magnification automatic macro lens. If you desire higher magnification, you have even more choices. You could add extension tubes between the lens and the camera for 2× increases; or, if you still want to maintain the same distance between lens and subject, you could use the TC-16A converter. If extreme magnification is necessary, we would then suggest the use of the PB-6 bellows, with which 10:1 magnifications can be accomplished.

LIGHT FOR THE SYSTEM

With such magnification, you will find that sunlight will not give enough exposure for handholding the camera, so a flash becomes necessary. The SB-21 Nikon flash is the perfect companion for the reverse-lens system. This compact ring flash comes with a filter ring that allows it to directly attach to the reverse-lens system. The main power pack itself attaches to the hot-shoe on top of the camera, and connects through a special cable that delivers power and flash sync to the ring flash itself. The SB-21 has manual, 1/4 power, 1/16 power, and TTL flash settings. A 45° angle diffusion device attaches to the front of the ring flash and redirects the flash beams closer for reverse-lens systems.

The SB-21 also has a flash-tube selection switch that allows you to select both, left, or right flash tubes, in case you want to change the lighting ratio. If you want to backlight or top-light a subject, an SB-24 flash can be added to the system via the SC-17

1. The equipment used for most of these shots: Nikon N8008 camera, BR-2 reversing ring, 28mm lens reversed, BR-6 adapter ring.
2. Watch was shot at 2.25× magnification with reversed 28mm lens.
3. Water drops were photographed at 2.25× magnification with reversed 28mm lens.
4. Toothbrush was shot at 9.6× magnification with reversed 28mm lens on PB-6 bellows.
5. Flower detail was photographed with reversed 28mm lens at 2.25×.

REVERSE-LENS MAGNIFICATION TABLE

Lens Focal Length	50mm	35mm	28mm	24mm	20mm
No Extension	.8×	2.1×	2.3×	2.6×	3.0×
TC-16A	1.2×	3.2×	3.4×	3.9×	4.4×
PN-11 Ext. Tube	1.7×	3.6×	3.8×	4.4×	5.5×
TC-16A & PN-11	3.0×	5.6×	6.5×	7.4×	9.0×
PB-6 Bellows	5.1×	8.5×	9.6×	11.0×	14.0×
PB-6 Bellows & TC-16A	8.0×	12.0×	14.4×	18.0×	20.9×

Note: Magnifications may vary slightly due to different lens designs.

List prices: PB-6, \$ 332.50; BR-2A, \$28.50; BR-5, \$28.50; TC-16A, \$227.50; AR-10, \$78.50; SB-21A, \$525; SB-21B, \$500; SB-24, \$370; PN-11, \$152.50; SC-17, \$59.50.

flash cord. When the SB-24 and the SB-21 are both set to TTL, they work together to attain correct exposure. If you want background exposure also, you can mount the camera on a tripod, set the SB-24 to the rear position, and press the shutter. This combination will force the system to correctly expose for foreground, top or backlight, and background exposure, as well. An impressive advancement over the days when we stuck our finger in the air for exposure.

REVERSE-LENS TIPS

After extensive testing of the Nikon reverse-lens system, we have a few suggestions which should benefit first-time users.

1. At extreme magnifications the SB-21 flash will not have enough power to illuminate the scene at f/16 or smaller. The solution is to open the lens aperture, or use ISO 200+ films.
2. Depth of field at high magnification is very shallow, and it may not be possible to get everything in focus. Try to focus towards the front of the subject, and the focus will fall off as you go towards the back of the scene. Out-of-focus areas behind the subject are generally more acceptable to the eye than out-of-focus areas in front of the subject.
3. When shooting subjects with considerable depth, try to move the camera or subject so that the lens is parallel to the subject.
4. When you find a good subject, try several magnifications, as the best magnification may not be the one you liked in the viewfinder. Depth of field, lighting, and focus all change with different magnifications.
5. If you want to add additional lighting effects such as top and backlighting, an additional SB-24 flash can be

used via the SC-17 flash cord. By placing the SB-24 in the rear position, you can have total control over the scene.

6. At high magnifications, a single flash may be more desirable for contrast and subject separation from the background. If you use the SB-21 ring flash, merely turn off one side of the flash head. An alternate method would be to use the SB-24 flash unit by itself.

7. Giant macro suns in the background can be created by using available light only, with the lens wide open. If you point at the sun, the corresponding shutter speed will approach 1/8000 second. Keep in mind that the depth of field will be very shallow, and flat subjects will fit this type of picture better than others.

8. At high magnifications, do not automatically assume that the best shots are with the aperture stopped all the way down. At these magnifications the laws of physics dictate that as the lens is stopped down, the depth of field increases, and the sharpness decreases. In other words, a trade-off, where you must decide which is most important.

9. Lighting patterns with the SB-21 can be changed by rotating the flash head so that the flashes are top/bottom, left/right, upper left/lower right, etc. Colored gels and/or neutral-density filters can be added to one or both sides of the flash head for creative effects.

10. Almost everything can be a subject. Nature, scientific, industrial, and household items all can make for interesting close-ups. Some camera clubs have sessions where common objects are photographed and projected onto the screen for the audience to guess what they are. ■