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INTRODUCTION

The mark of a truly professional camera is not only the sophistication and handling ease it provides, but the type and quality of accessories that go along with it. In this respect, too, the F3 is the finest camera in its class, because of the virtually limitless variety of accessories that can be used with it. To the fabulous Nikon System—a system containing more than 60 interchangeable lenses and a variety of specialized equipment—the Nikon F3 brings its own exclusive line of photographic accessories. Thus, the Nikon System remains the most comprehensive in the world.

The accessories developed especially for the F3 include four interchangeable viewfinders, 20 focusing screens, the Motor Drive MD-4, the Camera Back MF-6, and two electronic flash units— Speedlights SB-11 and SB-12. Indeed, there just isn't any picture-taking situation which the Nikon F3 can't handle. From shooting fast action at 6 frames per second to metering flash exposures through the lens*, everything is taken in stride. This brochure is the second half of the Nikon F3 Technical Manual and provides detailed information on the major accessories presently available for the F3, Nikon's top-of-the-line camera.

* The Motor Drive MD-4 provides 6 fps at 1/125 sec. or above with the mirror in the up position when using the NiCd battery pack; TTL flash output control is possible only with the Nikon Speedlight SB-12 or the SB-11 and TTL Sensor Cord SC-12.





This system chart shows the accessories available for the full range of printing of this brochure. However, due to limitations in space, the full range of accessories which can be used with the F3 are not pictured. This includes Nikkor and Nikon Series E lenses, close-up equipment, camera cases, gadget bags, etc.

VIEWFINDERS



No professional camera would be complete without interchangeable viewfinders, because, simply stated, no one viewfinder is perfectly suited for all shooting situations. For this reason, the Nikon F3 offers a choice of four different finders to handle every conceivable photographic need. In addition to the standard Eyelevel Finder DE-2, there are three others: the Action Finder DA-2, the Waist-Level Finder DW-3, and the 6X High Magnification Finder DW-4.

For strength, all viewfinders are constructed of die-cast copper-silumin-aluminum alloy and brass, whereas the prisms are made of the highest-quality glass produced in Nikon's own glassworks. For the brightest possible image, the reflection surfaces of the prisms are silver-coated, while the other surfaces feature anti-reflection coating. Furthermore, each finder has its own miniature optical system for projecting the exposure information through the finder, so that it always appears *unreversed* and *outside* the picture area for legibility.

In addition, automatic and manual exposure control, plus the exposure readout, is possible with every Nikon F3 finder. The reason? Because the SPD metering cell and other microelectronics are now all housed in the camera body. So, changing the finder does not affect the metering system. Following the tradition set by the Nikon F and F2, all finders for the F3 offer virtually 100% viewfinder field coverage. For professional assignments, especially those in which the transparencies will be reproduced in printed form, it's imperative that the photographer know the exact cropping of the final picture. With the F3, he is assured that what appears in the viewfinder is virtually what will be recorded on the film. Such accuracy is possible due to precision manufacturing techniques which make it possible for the camera body's focusing screen supporting frame and the film gate to be of the same size and the same optical distance away from the lens mounting flange.

Finally, both the eyelevel and high magnification finders contain their own eyepiece blinds for use when shooting with the eye removed from the eyepiece. With the SPD located at the bottom of the mirror box, the F3 is remarkably unsusceptible to stray light. However, an eyepiece blind still comes in handy when working in situations where strong light is coming from the top or from behind.

Attachment/Removal

The Nikon F3 features an easy method of viewfinder attachment and removal. To detach the viewfinder, simultaneously push back both finder release levers with the thumb and index finger; then lift the finder out (see photos above) To install a finder, place it on top of the camera and push down until it locks into place. It's that simple. The main reason why the F3 finders snap, instead of slide, into place is this: With Nikon's top-mounting system of attachment, the spring-loaded clips at the bottom of the viewfinder press against the frame of the focusing screen. So, there is no chance of the focusing screen's becoming dislodged and causing an error in focusing even if the camera is handled roughly.





EYELEVEL FINDER DE-2





Compact and lightweight, the Eyelevel Finder DE-2 is supplied with the Nikon F3 as standard equipment. This viewfinder provides eyelevel viewing with the image upright and unreversed, making it ideally suited for general picturetaking. The DE-2's prism is silvered for improved brightness. Special anti-reflection coating is applied to the side facing the focusing screen. By employing an independent optical system of four tiny mirrors, exposure information is projected through the finder, appearing above and *outside* the picture area for unobstructed viewing.

The finder eyepiece is multicoated with the use of the exclusive Nikon process called NIC, or Nikon Integrated Coating. In addition, it is threaded for attachment of various viewing aids (see page 12 for more details). To prevent extraneous light from entering from the rear, such as when using the self-timer or a remote control device, the DE-2 has a built-in eyepiece shutter.

Visual image magnification (with the standard 50mm lens set at infinity) is 0.8X with an apparent viewing distance of one meter. The diopter is -1 D.

Specifications

Type of unit

Usable camera Finder coverage

Visual image magnification

Diopter Viewfinder display

Eyepiece shutter Eyepiece attachment size Dimensions

Weight

Interchangeable type finder with eyelevel viewing Nikon F3 only Virtually 100% of image recorded on film 0.8X (with 50mm f/1.4 lens at infinity) -1 D LCD exposure information, ADR f/number and LED ready-light Provided 19mm dia. (P = 0.75) 38.5mm(H) x 53.6mm(W) x 65.5mm(D) 120g

ACTION FINDER DA-2





This eyelevel-type "action" finder is ideal for fast-moving events because the photographer can view the entire picture image with the eye up to 60mm away from the eyepiece. Furthermore, the DA-2 is indispensible for difficult sports or industrial shots, in which a helmet, goggles or safety glasses must be worn; it also allows scuba divers to see the entire frame with the F3 encased in a special underwater housing.

By using a Nikon-glass optical system of two prisms and three lenses, the DA-2 provides an upright and unreversed image of the subject. Moreover, two additional small prisms and two mirrors allow the exposure information display to be projected through the finder, so that it appears unreversed. However, with this finder, the display appears below the frame instead of above (see the light-path diagram for details). Image magnification is 0.6X, and its diopter is -0.75 D.

Specifications

Type of unit	Interchangeable type finder with evelevel viewing
Usable camera	Nikon F3 only
Finder coverage	Virtually 100% of image recorde
Visual image magnification	0.6X (with 50mm f/1.4 lens at infinity)
Diopter	-0.75 D
Viewfinder display	LCD exposure information, ADF f/number and LED ready-light
Dimensions	59.5mm(H) x 52.9mm(W) x

Weight

ge recorded on 4 lens at tion, ADR dy-light (W) x 73.2mm(D) 300g

WAIST-LEVEL FINDER DW-3





The Waist-Level Finder DW-3 allows the F3 to be used at a low angle (hence the name "waist-level") or upsidedown over the photographer's head for shooting over crowds. The DW-3 is also ideally suited for viewing the subject from directly above the camera with the camera attached to the vertical column of a copystand. Because the DW-3 does not have a main prism, the image is viewed directly off the focusing screen; therefore, it is upright but reversed from left to right. However, through the use of three small mirrors and a tiny prism, the exposure information is unreversed and is shown **above** the picture area. Image magnification with the DW-3 is 1X (i.e., when used with built-in pop-up 5X magnifier).

For convenience in viewing and focusing, the Waist-Level Finder DW-3 has a self-erecting hood, which is opened by pushing the button at the rear of the unit; it also features a built-in pop-up 5X magnifier for critical focusing on the center of the image. To exclude stray light when shooting on Automatic or taking a manual exposure reading, the built-in magnifier should be in the up position with the photographer's eye as close to it as possible. An alternate way is to shield the finder with the hand or close the hood completely before taking the picture.

Closing the DW-3's hood is simplicity itself: just push down on the top plate. This can be done even with the magnifier in the up position. And once the Waist-Level Finder is closed, the focusing screen is protected against dust and moisture.

Type of unit Interchangeable type finder with waist-level direct viewing of focusing screen	9
Usable camera Nikon F3 only	
Finder coverage Virtually 100% of image recorded o film	n
Visual image magnification 1X (with 50mm f/1.4 lens set at infinity) via built-in 5X pop-up magnifier	
Viewfinder display LCD exposure information, ADR f/number and LED ready-light	
Dimensions 38.5mm(H) x 54.2mm(W) x 59mm(D)
Weight 90g	

HIGH MAGNIFICATION FINDER DW-4





Providing 6X magnification of the entire picture area, the DW-4 is useful for critical focusing, such as when the camera is attached to a bellows unit or microscope. It has a built-in rubber eyecup and offers +3 to -5 diopter adjustment for individual eyesight correction. When used with a focusing screen having a cross-hair reticle (such as Type C or M), the DW-4 allows focusing on the aerial image using the parallax focusing method.

This method requires that the photographer turn the DW-4's diopter adjustment ring until the cross hairs on the focusing screen appear sharp. Next, he focuses until the image on the ground glass appears sharp. Then, to ascertain critical focus, he moves his eye back and forth or up and down. If the cross hairs remain stationary in relation to the image, then the focus is correct. However, if the cross hairs seem to move as the eye is moved, then focus is not correct and must be readjusted.

The DW-4 provides an upright but reversed image with a magnification of 1.2X. And like the Waist-Level Finder DW-3, this finder uses three tiny mirrors and a prism, so that the exposure information display appears unreversed and **above** the picture area. In addition, a flip-up rubber eyepiece cover is built into the eyecup to exclude stray light when making automatic or manual exposure readings with the eye away from the finder.

Specifications

Type of unit	Interchangeable type finder with aerial-image, waist-level viewing
Usable camera	Nikon F3 only
Finder coverage	Virtually 100% of image recorded or film
Visual image magnification	1.2X (with 50mm f/1.4 lens set at infinity)
Diopter	+3 to -5D adjustment possible
Viewfinder display	LCD exposure information, ADR f/number, and LED ready-light
Eyepiece cover	Rubber flip-up-type provided
Dimensions	63.5mm(H) x 54.2mm(W) x 59.6mm(D)
Weight	220g

VIEWING AIDS

To increase viewing and focusing ease with the Eyelevel Finder DE-2, the following accessories are available.

Rubber Eyecup



By preventing stray light from entering the viewfinder, the rubber eyecup improves the contrast of the viewfinder image. It also offers eyeglass wearers excellent protection against scratches.

Eyepiece Correction Lenses



Screwing into the eyepiece of the DE-2 directly, eyepiece correction lenses allow nearsighted and farsighted photographers to view and focus accurately without having to wear their glasses. Nine lenses are available in +3 to -5 diopters.

Eyepiece Magnifier DG-2





For those occasions when ultra-critical focusing is required with the DE-2, the eyepiece magnifier provides a quick and convenient means of obtaining a 2X magnification of the central portion of the finder image. The DG-2 is hinged, so that it may be swung up and out of the way when composing the image in the viewfinder. It also has a built-in eyesight adjustment system, offering eyesight correction of from +2 to -4 diopters when attached. This accessory is especially useful for close-up photography and copy work.

Right-Angle Viewing Attachment DR-3





The DR-3 screws into the eyepiece of the F3's standard eyelevel finder, providing an upright and unreversed image with right-angle viewing. It can be rotated laterally to provide views from either side, as well as from above. A built-in rubber eyecup and eyesight correction of from +3 to -5 diopters are provided.

FOCUSING SCREENS



One of the most important benefits of a single-lens reflex camera is the ability to view the image through the actual picture-taking lens. By using a reflex mirror to reflect the light up to the focusing screen, the photographer is able to see and compose the image accurately. For this reason, the focusing screen becomes all-important in determining the quality of the image seen in the viewfinder. In combination with the finder, it determines the contrast, brightness, and focusing accuracy of the viewing image.

Of paramount importance is the positioning of the focusing screen: Unless it is in a plane corresponding exactly to the film plane, the focusing accuracy of the camera will be off. In the F3, the focusing screen is held securely in place at the top of the mirror box by an aluminum supporting frame and spring-loaded pin; also, it cannot move, thanks

to two spring-loaded clips on the bottom of each viewfinder which apply equal pressure to both sides of the focusing screen frame. Held in this position, the focusing screen is exactly the same optical distance away from the lens mounting flange as is the film. Therefore, when the image appears in focus in the finder, it will be rendered sharply on the film when the picture is taken.

Continuing Nikon's tradition of outstanding focusing versatility, no less than **20** focusing screens are available for the F3. At his disposal the Nikon photographer has the widest selection of focusing screens available for any camera on the market today. And because of precision manufacturing techniques used in producing the viewfinders and focusing screens, coma and distortion are extremely well corrected.

NIKON F3 FOCUSING SCREENS

The method of focusing with the single-lens reflex camera is via the focusing screen positioned in the viewing system consisting of lens and reflex mirror. The mirror makes possible viewing through the mounted lens and, thus, enables the photographer to view and compose the image exactly as it will appear on film—a feature not available with cameras employing separate viewing/focusing systems. The mirror also facilitates focusing by directing the image to the focusing screen, the latter positioned to duplicate the location of the film plane; thus, focusing is possible with great accuracy, but without the difficulties associated with large-format cameras requiring focusing right at the film plane. Nikon focusing screens are available in a solid line-up of

length. Excellent for poor lighting conditions, and for taking shots of moving objects. Depth of field not observable with these screens.



TYPE A: Matte/Fresnel with horizontal rangefinder Matte/Fresnel field with central 3mm-diameter split-image rangefinder, horizontally aligned. Designed for quick and accurate focusing, particularly with lenses of brighter maximum aperture. Rangefinder prism alignment makes for rapid operation with subjects containing vertical lines and/or surfaces. Screen also provided with centrally-positioned, 12mm-diameter etched reference circle denoting area of centerweighting for TTL exposure measurement. Excellent for general photographic applications with lenses brighter than f/4.5 in maximum aperture. **TYPE B:** Matte/Fresnel with focusing spot Matte/Fresnel field with central 12mm-diameter fine-ground matte focusing spot. Absence of central rangefinder/microprism aid makes for less distraction when viewing and focusing, particularly with ultra-wide or super-telephoto lenses. Focusing spot corresponds to area of center-weighted TTL exposure measurement. Rated excellent with all lenses, this screen proves especially good with lenses having small maximum apertures, such as Reflex-Nikkors, as well as for close-up photography applications. **TYPE C:** Matte with cross hair and clear spot Fine-ground matte field with central 4mm-diameter clear spot and black cross-hair reticle. Absence of Fresnel lens makes usability of this (+)screen most suitable for applications, such as photomicrography or astrophotography, employing high magnification finders for aerialimage, parallax focusing. For these purposes use with the 6X High Magnification Finder DW-4 is recommended. Not for general applications. **TYPE D:** Plain matte Overall fine-ground matte field. Absence of other focusing aids ensures unobstructed viewing. Excellent for use with long telephoto lenses (particularly those lenses having an exit pupil at long distance from the focal plane), as well as fisheye lenses producing a circular image. Limited suitability with telephoto lenses down to a focal length of 135mm. Recommended for experienced photographers who are not in need of other focusing aids. TYPE E: Matte/Fresnel with focusing spot and grid Matte/Fresnel field with central 12mm-diameter fine-ground matte focusing spot and etched grid. Focusing spot corresponds to area of center-weighted TTL exposure measurement. Vertical and horizontal lines forming grid (consisting of four 7.5mm squares and four 7.5 \times 6mm rectangles) aid in composing subject. Rated excellent with all lenses, this screen proves especially good for exacting reproduction work, such as copying, as well as for architectural photography with PC-Nikkor lenses. **TYPE G:** Fresnel with microprism focusing spot Clear Fresnel field with central 12mm-diameter microprism focusing spot. Designed for extremely bright viewing and focusing, particularly suitable for use in poor light, and available in four models (G1 \sim G4) that match the focal length of the lens in use. 12mm-diameter microprism focusing spot corresponds to area of center-weighted TTL exposure measurement. Depth of field not observable with these screens. **TYPE H:** Fresnel with overall microprism Fresnel field with overall microprism pattern. Designed for rapid focusing on any part of the field, with maximum edge-to-edge brightness. Available in four models (H1 ~ H4) for lenses of specific focal

models and types to meet the needs of various focal lengths _ and maximum aperture conditions, as well as for special types of photography requiring high magnification of the subject. Presently, 20 different screens are available for direct mounting in the Nikon F3 equipped with virtually any finder configuration. As the selection of the type of screen needed to meet the needs of the photography at

hand can be, at first appearance, a difficult task, familiarity of the structure and use of Nikon screens is essential. The following tables and technical information provide the comprehensive information required to make the task of selection that much easier.



Installation/Removal



To simplify installation and removal, the frame of each screen has a protruding edge at the rear. Once the viewfinder is removed, the focusing screen can be taken out by inserting a fingernail under the rear edge of the screen and lifting it out (see top photo). To install another screen, simply insert the front edge (the edge with the slot in the middle) under the pin and push the rear edge of the screen down into place (see bottom photo). Like changing the viewfinder, focusing screen interchange is now a one-handed operation.

Basic Elements of a Focusing Screen

Unlike the simple ground-glass plates used in large-format view cameras, the F3's focusing screens are complex optical devices consisting of three basic parts: an acrylic focusing surface at the bottom, a glass condenser lens on top, and an aluminum frame to hold both sections together (see Fig. 1). For ease in manufacturing, the focusing surface is now made of acrylic; however, you still hear it referred to as a "ground glass," because formerly it was glass which was abraded on one side, giving it a translucent surface on which a visible image could be formed.

Focusing Surface

The bottom half of the focusing screen contains the focusing surface. Light coming in through the lens and reflected from the reflex mirror strikes this portion of the focusing screen first; therefore, this is the plane where the image comes into focus. To make the image recognizable and easy to focus, the focusing surface usually contains one or more focusing aids, plus a matte field and Fresnel lens.

FOCUSING AIDS

To ensure fast and accurate focusing regardless of the subject matter or lens in use, the focusing surface usually contains at least one type of focusing aid.

Split-Image Rangefinder

Probably the most popular type of focusing aid, the split-image rangefinder is built into the center of Nikon Type A, K, L, P, R, and T focusing screens. This device consists of two wedge-shaped prisms placed side by side but at opposite angles to each other (see Fig. 2): Its purpose is to deviate the light in two different directions. When sharply focused, the image appears continuous within the rangefinder spot; when out of focus, it is split into two halves. In this way, a split-image rangefinder provides an absolute indication of the focus condition (either "in focus" or "out of focus") (see Fig. 3). Because the images only align at the exact focus point, a split-image rangefinder is particularly well-suited for focusing on subjects having straight lines or welldefined contours.

However, one disadvantage of this type of focusing aid is the critical relationship between the angle of the prisms and the maximum aperture of the lens in use. With Types A, K, L, P and T, the refracting angle of the prisms is $10^\circ.$ This angle is sufficient for the majority of Nikkor lenses, because it allows enough light to reach the viewer's eye. However, with lenses of approx. f/4.5 or slower, either half of the rangefinder may blacken out when the eye is shifted slightly offcenter. To overcome this problem, Nikon has produced the Type R screen which is specially designed to work with lenses having maximum apertures between f/3.5 and f/5.6.



Element	For viewing	For focusing	Function
Matte field	0	0	Scatters the light from the image so that the entire screen can be observed with the image on the surface appearing sharp.
Condenser lens	0	1 Contractorial	Converges the light rays into the eye.
Fresnel lens	0		Same as condenser lens but much flatter. The G and H screens come in four models each with different powers to correspond to the focal length of vari- ous lenses.
Split-image rangefinder		0	For quick and accurate focusing. Specially arranged prism wedges split the image into two distinct parts when the image is out of focus. Correct focusing unites the image.
Microprisms		0	Deflect the light and break the image into a myriad of fragments for a blurred effect when image is not in focus. Usable with slower lens speeds than possible with split-image.
Cross-hair reticle in clear spot		0	Permits parallax focusing when extremely accurate focusing is required, as in photomicrography and astropho- tography.



Microprisms



Next in popularity to split-image rangefinders, microprisms are used in Type G, H, J, K, and P screens. A microprism is just that: a tiny, foursided, pyramid-shaped prism whose sides and base measure 0.1mm by 0.1mm. There are approximately 1,530 of these miniature prisms in the central focusing aid of the Type J screen. In Types K and P, the 1mm-wide microprism collar around the split-image rangefinder contains about 5,000. In the 12mm-diameter spot of Type G, there are some 11,300 microprisms, while the overall surface of a Type H screen has an astronomical 86,400! Microprisms are based on the same principle as split-image rangefinders: When the image is in focus, light passes directly through the prisms, allowing the image to appear sharp and clear. However, when out of focus, the image looks "fuzzy," because each prism deflects the light, thus fracturing the image (see Fig. 4). Unlike a split-image rangefinder which works best with subjects having definite boundaries, microprisms allow rapid focusing on any part of the subject. Another advantage is that the image on the microprism area is considerably brighter than that viewed on a matte field; therefore, microprisms make it easier for the photographer to focus accurately in dim light.

Microprism focusing, however, is not without its difficulties. For one thing, microprisms do not allow the observation of depth of field-only the exact in-focus image is seen sharply. Also, microprisms are subject to similar darkening problems with lenses of smaller aperture, just like split-image rangefinders. To solve this problem, Nikon offers screens with two different prism constructions. Types J, G1-3, H1-3, K, and P contain microprisms with a refracting angle of 8°, while those of Types G4 and H4 have an angle of 4.5°. Types G4 and H4 are designed for use with super-telephoto and catadioptric lenses having maximum apertures as slow as f/8-f/11. Thus, the convenience of microprism focusing is available to all Nikon F3 photographers regardless of the lens in use.

Cross-Hair Reticle in a Clear Spot

A cross-hair reticle in a clear spot, as found on Types C and M, provides the most critical method of focusing, because it eliminates the potential darkening associated with split-image rangefinders and microprisms. However, the focusing technique used with the cross hair and clear spot is more time-consuming, and thus generally limited to photography of non-moving subjects, such as in close-up shooting, copy work, and photomicrography. Focusing is performed via the parallax method as already described in the explanation of the 6X High Magnification Finder DW-4 (see page 11 for details).

Matte Field

All but three types of focusing screens for the Nikon F3 (Types G, H, and M) have a matte field. Its purpose is to scatter the light, so that the image can be viewed from above the screen. This scattering effect is essential; as without it, the photographer would be able to see only a small portion of the image at any one time.

The effectiveness of a matte field for viewing and focusing depends to a large extent on its granularity—a coarse surface produces a uniformly bright image from center to edges and is effective for focusing because it produces blurring only in proportion to the state of focus (see Fig. 5). A matte field is always used in conjunction with a Fresnel lens to collect scattered rays of light (see next section for more information).

Another major benefit of a matte field is that it allows the photographer to get a visual preview of the depth of field when the lens is stopped down to the taking aperture. Some of the screens Nikon makes do not have a matte field. These include Types G, H, and M—the brightest and easiestto-focus of all screens for the F3. But remember, they do not provide any depth-of-field information.



Fresnel Lens

The top portion of the focusing surface usually contains a Fresnel lens. Named after its inventor, French physicist Augustin Jean Fresnel (pronounced Fre-nel'), the Fresnel lens' main purpose is to distribute the image brightness over the entire screen. It consists of a series of concentric rings with the top part of each ring sloped to match the convex curvature of a condenser lens (see Fig. 6); this results in a stepped, but level surface that provides the same light-collecting characteristics as a condenser lens, but without the usual thickness. The concentric rings of all Fresnel lenses used in the Nikon F3's focusing screens have a pitch of 0.04mm.

Also, with a Fresnel lens, it's possible to modify the lens power by simply changing the angle of the upper surfaces of the concentric rings. Thus, Fresnel lenses can be constructed to match the characteristics of various types of interchangeable

lenses (see Fig. 7). In two of the F3's focusing screens—Types G and H— there are four models available with each model having a different condenser lens power. Model 1 has the greatest lens power and is usable with wideangle lenses; Models 2, 3, and 4 have progressively less power and are used with normal/short telephoto, medium telephoto, and super-telephoto lenses, respectively.





Condenser Lens

The upper portion of the focusing screen consists of a condenser lens. Flat on the bottom with a convex curvature on top, the purpose of this lens is to collect the rays of light from all parts of the focusing surface and focus them to a point above the focusing screen. Without the condenser lens, it would be impossible to see the entire image clearly in the viewfinder. Another purpose of the condenser lens is to make the image equally bright from center to edges (see Fig. 8).

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LENS/SCREEN SELECTION CHART

The chart below has been prepared to assist you in choosing the right screen for the lens in use.

◎ = Excellent

Acceptable

The image is brilliant from edge to edge but the central rangefinder, microprism or cross-hair area is dim. Focus on the surrounding matte area.

○ = Acceptable

Slight vignetting or moire phenomenon (in the case of the microprism) affects the screen image. But the image on film shows no traces of this.

\triangle = Acceptable

Incompatible with any lens having a maximum aperture larger than f/2.8 since this decreases the efficiency and accuracy of the screen rangefinder: the in-focus image in the central spot may prove to be slightly out of focus on film. Focus on the surrounding matte area.

= Measure exposure by the full-aperture method.

= Use the stop-down measuring method. Blank means not usable.

Note: Since the Type M screen is used for macrophotography at a 1:1 magnification ratio as well as for photomicrography, its application is different from that of the other screens.

Lene	Screen	A/L	K/P	Т	В	E	J	R	С	D	G1	G2	G 3	G4	H1	H2	H3	H4	M
	6mm f/2.8	0	0	O	0	0	0	\triangle	•	0	0	0			O	0			
Fisheye	8mm f/2.8	0	0	0	0	0	O.		•	0	0	0			0	0			
	16mm f/2.8	0	0	0	0	0	0	\triangle			O	0			O	0			
	13mm f/3.5	O	0				0	0				0				0			
	15mm f/3.5	0	0	•	0	0	. 0	0				0				0			
	18mm f/4	0	0	0	0	O	0	0			0				O				
	20mm f/3.5	0	0	0	0	0	0	0			0				0				
	24mm f/2	Ô	0	0	\bigcirc	0	0					Q			\circ	O			
Wideandle	24mm f/2.8	O	0	O	O	0	0					0			0	Ô			
widealigie	28mm f/2	0	O	0	O.	0	\bigcirc	\triangle			O	\bigcirc			0	O			
	28mm f/2.8	0	\bigcirc	O	O		O	\triangle			O				O				
	E 28mm f/2.8	Ô	Ô	0	0	0	\bigcirc	· \			O				\bigcirc		16		
	28mm f/3.5	0	O	0	0	0	O	0			0	0			0	0			
	35mm f/1.4	0	0	O	Ô	O	0	\triangle				Ô			0				
	35mm f/2	0	0	0		0	O				0	0			0	0			
	E 35mm f/2.5	0	0	0	O	0	0				O	O			O	0			
	35mm f/2.8	0	0	0	O		\bigcirc	\triangle				0			\circ	O			
	50mm f/1.2	0	0	0	0	0	0					0				0			
Normal	50mm f/1.4	0	0	0	0	0	0					O				0			
. to mut	50mm f/1.8	0	0	0	0	0	0				0	O			0	0			
	E 50mm f/1.8	0	Ô	0	\square		0				0	0			0	0			
	85mm f/1.4	0	0	O	0	0	0					0			0	0			
	85mm f/2	0	O	0	O	0	O	\triangle				O			0	0			
	E 100mm f/2.8	0	0	0	O	O	0	\triangle				0			0	0			
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MOTOR DRIVE



MOTOR DRIVE MD-4

Designed in conjunction with the Nikon F3, the Motor Drive MD-4 is a logical extension of the camera body. The contoured handgrip is ideal for fast-action shooting, while the base of the unit slants forward dramatically to allow the camera/motor drive to stand up by itself on a flat surface. In fact, the design is so well conceived that the combination doesn't tip over even when a 200mm telephoto lens is attached.

Mechanically, the MD-4 is first rate. The exterior is constructed of the same die-cast copper-silumin-aluminum alloy used for the camera body. Thus, the MD-4 is rugged enough to take the bumps and jolts of daily professional use. And inside, the MD-4 uses a single coreless motor for both film winding and rewinding. A coreless motor is employed, because it is compact, very efficient, and has low inertia, allowing it to start and stop virtually instantaneously. In addition, the first three gears in the gear train have helical threads for more efficient energy transmission and lower noise.

Through the liberal use of ball bearings in the camera as well as the motor drive, plus fast-response microelectronic circuitry in both units (the MD-4 uses one IC), the Motor Drive MD-4 is able to advance the film continuously through the camera up to an unprecedented $\boldsymbol{6}$ frames per second.* A special switch is coupled with the second shutter curtain, so that a film wind ready signal is sent to the motor

drive's IC circuitry as soon as the second curtain reaches the end of its travel. As a result, single or continuous operation synchronizes with all shutter speeds. In addition, the MD-4 is able to wind the film immediately after the shutter closes without any time lag whatsoever.

Because of its elegant design, battery power consumption has been substantially reduced. The MD-4 now uses only *eight* AA-type penlight batteries housed in a single clip. Or in its place, a rechargeable NiCd battery pack can be installed. And because less space is required for batteries, the battery pack could be built into the base of the unit for an overall reduction in size and weight.

Another major advantage of the MD-4 is its ability to provide power to the camera's microelectronic circuitry. With the motor drive attached, as soon as the MD-4's trigger button is depressed, the camera draws all its power from the motor drive's power source. Thus, if a cold weather-resistant NiCd battery is installed in the MD-4, the Nikon F3 can be used in temperatures of down to -20° C without battery failure.

Yes, from a design as well as a user's point of view, the Motor Drive MD-4 is certainly one of the finest motor drives Nikon has ever built.

* Possible at shutter speeds of 1/125 sec. or above with the mirror in the up position when used with the NiCd Battery Unit MN-2.

Nomenclature



Battery clip release catch







Motor drive coupling prong

Rewind button pin

Camera positioning pin



Specifications

Shooting modes	Choice of single-frame (S) or continuous (C) firing via S-C mode selector; lock (L) position also provided	Number of 36-exp. rolls per fresh battery set	Guaranteed firing rate: approx. 60 with all types of batteries;
Shutter release	Electronic shutter release; initial		Slower firing rates, but still usable:
	pressure on trigger button switches on meter, power remains on for 16 sec. after finger is taken off button		approx. 70 with NiCd Battery Unit MN-2, approx. 100 with zinc-carbon batteries, approx. 140 with alkaline-
Firing rate	Up to 6 frames per second (fps) with		manganese batteries
	NiCd Battery Unit MN-2, up to 4fps with	Automatic film rewind	4.5 secs. with NiCd Battery Unit MN-2
	firing rates decrease at shutter speeds slower than 1/125 sec.		batteries for 36-exposure film; automatic film rewind stop with
Automatic winding stop	Motor shuts off at film's end with LED		optional MF-6 Camera Back
	indication, frame counter also provided	Shutter speeds	8 to 1/2000 sec. including "X"
	to automatically stop film winding	*	(1/80 sec.)
*	after preset number of exposures— useful in very low temperatures	Dimensions	146.4mm(W) x 114.7mm(H) x 70.7mm(D)
		Weight (without batteries)	480g

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CONTROLS AND MECHANISM Electronic Release

The MD-4's trigger button operates in exactly the same manner as the camera's shutter release button. When depressed halfway, the trigger button switches on the metering circuitry and activates the LCD exposure information in the viewfinder. When depressed completely, an electronic signal is sent to the mirror box combination magnet to start the sequence of steps leading to shutter release. Exactly 16 seconds after pressure is removed from the button, the meter and LCD turn off automatically to conserve battery power (see top photo).

Single-Frame or Continuous Shooting

For operational ease, the Motor Drive MD-4 features either single-frame or continuous shooting via its S-C mode selector.

At S (Single Frame)

To shoot single frames, the S-C mode selector is set at S. Then, at any shutter speed setting, except B and T, the motor drive trips the shutter once and winds the film in a single sequential step. At B, the shutter opens and stays open as long as the trigger button is depressed. At T, the shutter opens and remains open until the shutter speed dial is rotated to another setting. With the camera's release lock in the unlocked position, single frame shots can be taken (with the S-C ring at either S or C) by pushing the camera's shutter release button. In this case, the film does not advance until pressure on the button is released.





At C (Continuous)

To shoot a continuous sequence of shots, the S-C mode selector must be set to C. Then, as long as the trigger button is held down, shots will be taken rapidly in succession. Any shutter speed setting, except B and T, can be used. At shutter speeds slower than 1/125 sec., the firing rate automatically slows down to match the shutter speed in use.

Motor driven multiple exposures can be made by holding the multiple exposure lever in the out position while firing off a burst. When finished, one blank shot must be made by covering the lens with a lens cap. This advances the film to the next unexposed frame without adding an unwanted exposure to the multipleexposure photograph just completed.

At L (Lock)

To prevent the motor drive from being accidentally fired, the S-C mode selector can be set at L. At this position, the trigger button is locked and the motor drive will not operate. However, by turning the camera's release lock to the unlocked position, you can use the camera's shutter release button and film advance lever in the normal manner to take single shots as if the motor drive weren't attached.

With the MD-4 attached, the camera takes all its power from the motor drive's power source when the trigger button is depressed. Therefore, it makes no difference whether the camera's release lock is in the locked or unlocked position; in fact, it's probably best left in the locked position.



Automatic Film Winding

The MD-4 uses a single coreless motor to advance and rewind the film. Through the use of a special clutch system, the motor rotates in the same direction for both operations.

Following diagram I, this is how the film is advanced and the motor automatically stops: As the motor drive's trigger button is depressed all the way down, the power from the coreless motor(1) rotates the helical gears(2), (3), and (4) in the respective directions indicated by the arrows. Gear(5) then rotates in direction A. This tenses clutch torque spring(6). Protrusion(8) of clutch lever(7) pushes clutch(9) in direction B. Clutch(9) is attached to shaft(10) which in turn drives gear(11) in direction C. Then gear(12) rotates in direction D which turns coupling prong(13) for film winding. When the camera's connecting shaft has rotated exactly one revolution, it is automatically stopped by the camera's winding mechanism. While this is happening, gear(5) continues to rotate, because coreless motor(1) is still on. Protrusion(14) pushes the end of clutch lever(7) moving it in direction E. Ratchet pawl(15) pushes against gear (16),

turning it in direction F. Cam(17) then rotates in the same direction, pushing against protrusion(18) of auto-stop switch(19) to close the switch. Immediately, an electronic signal is sent to the motor drive's IC circuit, which then cuts off the power to the coreless motor. As clutch lever(7) rotates, spring(20) becomes tensioned and pulls the lever back to its original position. At the end of a roll of film, film tension stops the coupling prong from rotating. However, just as before, gear(5) continues to rotate, leading to the same sequence of steps which stops the motor drive.

Automatic Film Rewinding

To allow the photographer to change film quickly, the MD-4 features automatic film rewinding. When both rewind slides are pushed, a special rewind fork moves up through the hole in the bottom of the camera's cartridge chamber to engage the notched end of the film cartridge's spool. With a fully exposed 36-exp. roll, the MD-4 is able to rewind the film in approx. 8 seconds with a fresh set of alkaline-manganese penlight batteries; it takes approx. 5.5 sec. with the AC/DC Converter MA-4 and approx. 4.5 sec. when a fully recharged NiCd Battery Unit MN-2 is installed.

According to diagram II, this is how the film is automatically rewound: When the first rewind slide(1) is pushed to the left by the photographer, lever (2) pushes cam (3) up. Through the use of a special clutch system in shaft(4), coupling prong(5) is disengaged, while gear(6) is pushed up into position to complete the gear train for film rewinding. Then, when the second rewind slide(7) is pushed up, pin(8) pushes rewind clutch(9) and rewind fork(10) up into position. The protrusion underneath gear(11) engages with rewind clutch(9). As this happens, the coreless motor is turned on, rotating the gears in the respective directions shown by the arrows. Thus, the rewind fork rotates in direction A for automatic film rewinding. Subtractive Frame Counter

In below-freezing temperatures, film becomes brittle and easy to break. Therefore, to prevent the film from being torn accidentally at the end of the roll, the MD-4's subtractive-type frame counter can be set to the number of frames on the roll. Then when the counter reaches 0, the motor drive automatically shuts itself off *before* the film reaches an end. The counter is calibrated from 36 down to 0 with an orange dot below 0. All numbers are in white, except 36, 24, 20, and 12 which are in orange to correspond with the number of frames in commercially available cartridges.

The MD-4's frame counter is also useful for shooting short bursts on Continuous: the photographer simply sets the counter to the desired number of frames (photo 1). The motor drive then stops automatically when 0 is reached (photo 2). To reset the counter for another burst, first stroke the film advance lever, then move the counter from 0 to the desired number for the next sequence. Each time before resetting the MD-4's counter, the photographer should check the camera's frame counter to make sure there are enough exposures left on the roll for the next burst. If there aren't enough, the motor drive will cut off before the burst is completed. For normal shooting, the frame counter should be set to the orange dot; at this setting, the counter is disengaged.



Battery Check Button and LED's



The Motor Drive MD-4 keeps the photographer fully informed of all operating conditions via a battery check button and two LED's located on the back of the motor drive.

To check battery power, the photographer depresses the battery check button. If both LED's light up, then the power is sufficient to provide the fastest firing rates. If only one LED goes on, this indicates that the MD-4 can still be used, but it will operate at slower rates. If neither LED comes on, the batteries should be changed immediately for a fresh set.

The right-hand LED also lights up to indicate other camera functions. After a shot is taken (either at Single or Continuous), the LED comes on briefly to indicate film advance. Continuous glowing of the LED signals that the motor drive has automatically turned itself off. This occurs when there is an increase in film tension at the end of the roll or when the subtractive frame counter has reached 0. In addition, the LED stays lit to indicate automatic rewind-stop when the accessory Camera Back MF-6 is attached in place of the regular camera back.

Three Separate Electrical Terminals



To provide positive and separate electrical connection of various accessories for simultaneous use, the MD-4 has three terminals at the front of its base. They are the:

1) Magazine back terminal

Located at the base of the motor drive's grip, the magazine back terminal accepts the cord from a bulk-film magazine back, allowing connection to the motor drive's electrical power system.

2) External power terminal

The smaller of the two terminals located on the front of the motor drive opposite the grip, the external power terminal allows the AC/DC Converter MA-4 to be connected.

3) Remote terminal

The larger of the two, the remote terminal allows a variety of remote control devices to be attached.



MOTOR DRIVE ACCESSORIES

To complement the versatility of the MD-4, a variety of accessories are available. The majority of accessories already developed for use with previous Nikon motor drives are compatible with the MD-4. In addition, a few new acces-

sories for use with the MD-4 have been created. All in all, the total line of motor drive accessories for the MD-4 is unparalleled in 35mm photography.

Power Sources

Three separate power sources are available for the MD-4 to meet all shooting requirements.

Battery Holder MS-3



Supplied as standard equipment with the MD-4, the Battery Holder MS-3 accepts eight AA-type penlight batteries. For normal shooting up to a maximum of approx. 3.8 frames per second, the use of alkaline penlight batteries is preferred by many photographers, because the batteries are disposable and easy to obtain anywhere in the world. With each battery rated at 1.5V, this power source supplies a total of 12 volts to the motor drive.

NiCd Battery Unit MN-2 and Quick Charger MH-2



Probably the most versatile and economical power source is the rechargeable NiCd Battery Unit MN-2 and its companion Quick Charger MH-2. This optional battery pack provides the fastest firing rates with the MD-4. With a freshly charged battery, up to a maximum of 6 frames per second are possible (at shutter speeds of 1/125 sec. and above with the mirror locked in the up position). In addition, the NiCd battery is recommended when the photographer anticipates using the camera and motor drive in extremely cold weather (i.e., in temperatures of down to a minimum of -20° C). Because the F3 is specially designed to draw its power from the motor drive's power source when the MD-4 is attached, the reliable performance of a NiCd battery in below-freezing temperatures is a welcomed asset. With the Quick Charger MH-2 and a completely depleted battery, recharging to approx. 80% capacity requires approx. 3-1/2 hours under normal temperatures. The NiCd Battery Unit can be recharged approx. 100 times before replacement is necessary. The MN-2 power rating is 16.8V.

AC/DC Converter MA-4 and External Power Cord MC-11



This power source is highly recommended for photographers who plan to use their F3/MD-4 primarily in the studio. This includes fashion, advertising, as well as commercial photographers. The MA-4 converter takes standard AC current (100, 120 or 220V) and converts it into a stable 15V DC current for use with the motor drive. The External Power Cord MC-11 provides electrical connection between the converter and the external power terminal on the motor drive.

The following tables give the firing rates and the number of rolls of film expected from each type of power source.

	Battery type									
Shutter speed range (sec.)	AA penlight (zinc-carbon)	AA penlight (alkaline- manganese)	MN-2 (NiCd)	MA-4 (AC/DC converter)						
1/125~1/2000	3.8	3.8	5.5	5						
1/125~1/2000 (mirror up)	4	4	6	5.5						
			(Number of	36-exposure rolls						
Zinc-Carbon	-	60	100							
Alkaline-manganese		60		140						
NiCd Battery Unit MN-2		60 70								

The range of guaranteed firing rate The range within operative battery power but without guarantee of the rated firing speed

Remote Control Units

Nikon produces a variety of remote control units to allow the photographer to operate the Nikon F3 from a distance. All these accessories have cords which plug into the MD-4's remote terminal.

Remote Cord MC-12 with Button Release



For firing the MD-4 remotely at up to a distance of 3 meters, the MC-12 Remote Cord with button release has a handgrip and trigger button for convenient operation. When the button is depressed halfway, it automatically turns on the camera's metering system; when depressed completely, it fires the motor drive either singly or continuously (depending on whether the motor drive S-C mode selector is set to S or C).

Radio Control Set MW-1 and Connecting Cord MC-5



This Nikon radio control unit consists of a transmitter and receiver. The receiver portion of the set is connected to the motor drive via the Connecting Cord MC-5. Then the transmitter portion can be moved up to 0.7km away for remote control firing. Three separate channels allow three motor-driven cameras to be operated independently of each other. This accessory provides completely interference-free operation.



Modulite Remote Control Set ML-1 and Connecting Cord MC-8



This remote control accessory also consists of a transmitter and receiver. The receiver portion has a standard ISO accessory shoe for mounting on the camera using the Flash Coupler

AS-4 which is first attached to the F3's accessory shoe. The Connecting Cord MC-8, then makes electrical connection between the motor drive's remote terminal and the receiver. When fired, the transmitter emits a brilliant flash of modulated light which can be sensed by the receiver up to 60 meters away. Modulated light is used to prevent the camera from being triggered by regular electronic flash units. Two channels allow independent operation of two motordriven cameras at the same time. The following diagrams show the various uses of the ML-1.



Intervalometer MT-1 and Connecting Cord MC-5



Timing control of exposures and exposure intervals for advanced recording techniques, such as time-lapse photography or work sampling, are possible with the Intervalometer MT-1 and Connecting Cord MC-5.

The MT-1 has two timing control dials for selection of any of twenty different settings each, providing shooting and/or rest periods of up to eight minutes. Also, mode (one-time or multiple-sequence operation) and starting (instantaneous or delayed) functions are available via its selector switches.

Other features of the MT-1 include remote control capability for operation with other control devices, such as the Radio Control Unit MW-1. The MT-1 also has temperature compensation and voltage stabilizer circuits to adapt the output to the shooting environment; it can also be used in the field with penlight batteries. The MT-1 has a battery check provision, LED timing signal, and a full complement of cords for connection to the camera, external power source, or other remote control eqiupment. The DC power output of the power source should be 5.7±1V.

Terminal Release MR-2



This accessory plugs into the remote terminal and allows the MD-4 to be triggered using either the Nikon Cable Release AR-2 or the Double Cable Release AR-4. However, it does not provide a display of the exposure information inside the viewfinder when the button is depressed halfway.

Simultaneous and Time-Lag Shooting Accessories Remote Cord MC-4



With plus and minus banana-type plugs, the MC-4 Remote Cord can be used to fire up to three motordriven F3 cameras simultaneously. The above diagram shows the proper connection. For trouble-free operation, the common electrical leads (indicated by bold lines in the diagram) should be kept as short as possible.

Camera Backs

In addition to the standard F3 camera back, there is one other accessory back available.

Camera Back MF-6



This camera back provides automatic rewind-stop with the leader left outside the film cartridge for ease in handling in the darkroom. The MD-4's right-hand LED glows continuously to indicate that the film has been completely rewound.

Miscellaneous Accessories Pistol Grip Model 2 and Connecting Cord MC-3



This auxiliary grip can be screwed into either the motor drive's tripod socket or into the tripod mounting collar of a super-telephoto or Reflex-Nikkor lens to provide more stable hand-held shooting. The Connecting Cord MC-3, an existing Nikon accessory, then makes electrical connection between the grip and the MD-4's remote terminal. When the Model 2's trigger button is depressed all the way, it fires the motor drive either singly or continuously depending on the MD-4's mode selector setting.

Tripod Adapter AH-2



Because the battery clip is located in the base of the motor drive, the MD-4's tripod socket had to be positioned off-center. In certain cases, this might result in an unbalanced condition when the MD-4 is mounted on a tripod. To remedy the situation, the AH-2 was created. This accessory is a thin plate which screws into the bottom of the motor drive to provide a tripod socket which is in the middle.

ELECTRONIC FLASH UNITS



Nikon has two electronic flash units which provide completely automatic *through-the-lens* control of the flash exposure. They are the Nikon Speedlight SB-12 and the SB-11 (when used in conjunction with the TTL Sensor Cord SC-12).

The big advantage of automatic through-the-lens flash output control is that only what the lens sees will come out properly exposed. This means that regardless of how the light gets from the flash to the subject and back to the film, the exposure will be correct. The photographer can put a wideangle diffuser over the flash head, move the flash offcamera, or even bounce the light off the ceiling or walls. He can attach colored filters to the lens or use a telephoto lens. Even close-up photography with a bellows unit is very convenient.

Another benefit of TTL flash metering is that the photographer has a free choice of shooting apertures. Unlike conventional automatic electronic flash units which restrict the user to one or two f/stops, virtually any aperture on the lens can be used. Thus, the photographer has complete control over the amount of depth of field the final photograph will have.

This is how the system works: When the shutter release button is pushed, the shutter opens, and the electronic flash begins to fire. Light from the flash travels out to illuminate the subject and then is reflected back to the Passing through the lens, the light strikes the camera surface of the film (because the mirror is up) and then is reflected back down to the SPD cell at the bottom of the mirror box. Immediately, a small amount of current starts to be generated by the SPD which in turn is sent to the camera's logarithmic compressor/progressor for conversion into voltage. This voltage is then sent to the electronic flash's computation circuitry. At the same time, the film speed information is transmitted from the ASA/ISO film speed dial through the FRE to the same computation circuitry. Using this data, the speedlight's flash output control circuitry is able to determine when the amount of light striking the film is sufficient for correct exposure. When the exact instant is reached, the flash output is cut off. Then, the shutter closes, and you have a properly exposed flash picture (refer to the next page).

Flash Synchronization

The Nikon F3 offers X-synchronization for use with all Nikon electronic flash units at manual shutter speeds of 1/80 sec. (X) and below. In addition, with the shutter speed dial at "A" or manually set to 1/125 sec. or faster, the correct sync speed of 1/80 sec. is automatically set when using the directmounting Nikon Speedlight SB-10 or -12, or with the SB-11 and the appropriate accessory cord. Moreover, FP, M, and MF-type flashbulbs will synchronize at all shutter speeds from 1/30 sec. to 8 sec., plus B. Consult the table below for details.

General Information About Electronic Flash

The basic principle behind electronic flash is the same as that of lightning: a brilliant burst of light is produced when electricity passes between two electrodes. In the case of lightning, electrodes occur at random during the spontaneous transfer of enerav. In an electronic flash unit, the electrodes are permanently located at either end of a sealed glass tube, which is filled with the inert gas, xenon. Ordinarily, xenon is electrically nonconductive. However, when the camera's shutter is tripped, a tiny triggering circuit inside the flash unit is closed. Immediately energy surges to one end of the flashtube and rapidly ionizes the xenon gas. In this state, the gas becomes highly conductive, effectively closing the circuit. Energy then flows through the tube to the electrode on the other side, thus creating the brief flash of light. After the flash fires, the xenon gas instantaneously returns to its normal nonconductive state Power for an electronic flash unit is provided by standard AC current or one or more batteries. The final element in an electronic flash's design is the storage capacitor. It allows energy from the power source to build up until the voltage is high enough for adequate light output. The burst of light from an electronic flash is extremely short in duration. In units providing automatic exposure, light output is controlled by varying the flash duration.





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SPEEDLIGHT SB-12 Nomenclature



Designed exclusively for the Nikon F3, the Speedlight SB-12 is a direct-mounting electronic flash unit providing automatic through-the-lens control of the flash exposure. By using a silicon-controlled rectifier and series circuitry, the flash unit is able to save its excess energy for the next shot, thus reducing recycling time and increasing the number of shots possible per battery set.

As soon as the flash is recycled and ready to fire, the ready-light inside the F3's finder lights up. The same LED blinks after the shot is taken to let you know that the light was insufficient for correct exposure and should be taken again at a closer distance or a wider aperture. The LED also blinks to signal improper mounting or when the camera is not set within the working range of ASA/ISO 25 to 400.

The SB-12's mounting foot slips onto the F3's accessory shoe from the front and locks into place via its rotating

locking ring. Brass rails on the accessory shoe as well as the brass-plated mounting foot ensure secure connection. The three pins in the mounting foot then provide direct electrical connection to the contacts in the F3's accessory shoe.

With a guide number of 25 (ASA/ISO 100 and meters) or 40 (ASA/ISO 25 and feet), the SB-12 provides just the right amount of light for subjects located between 0.6m and 15m (2ft. and 49ft). Angle of coverage is wide enough for use with a 35mm wideangle lens. In addition, the Wide Adapter SW-4 slips over the flash head to increase the angle when using a 28mm lens.

Other features include an open-flash button for test-firing the unit, an easy-to-use calculator dial for automatic or manual settings and a sync terminal for multiple-flash operation. Furthermore, the SB-12 can be used off-camera by attaching the TTL Sensor Remote Cord SC-14.

NE O MEDI JOSENS



Specifications

Light output control

Guide number (ASA/ISO 100 and meters) (ASA/ISO 25 and feet) ASA/ISO film speed range Angle of coverage

Automatic shooting range (ASA/ISO 100) Recycling time Automatic: silicon-controlled rectifier (thyristor) and series circuitry Manual: full output

25 (18 with Wide Adapter SW-4) 40 (28 with Wide Adapter SW-4) ASA/ISO 25~400 Horizontal: 56° (67° with SW-4) Vertical: 40° (48° with SW-4) Varies with f/stop selected within the range of 0.6~12m (f/2~f/22 available) Automatic: variable depending on shooting distance; Manual: approx. 9 sec, with fresh set of zinc-carbon batteries, approx. 8 sec. with alkalinemanganese batteries

Number of flashes

Power source

Ready-light Open-flash button Mounting Dimensions (excluding mounting foot) Weight (without batteries) Automatic: variable depending on shooting distance; Manual: approx. 60 with fresh set of zinc-carbon batteries, approx.. 160 with alkalinemanganese Four 1.5V AA-type batteries (NiCd batteries may be used) Provided Provided Directly on F3 accessory shoe 105mm (W) x 40mm (H) x 85mm (D)

350g

SPEEDLIGHT SB-11 Nomenclature



Compatible with all Nikon cameras, the bracket-mounting Speedlight SB-11 features automatic control of the flash exposure via a plug-in sensor. And with the addition of the accessory TTL Sensor Cord SC-12, the SB-11 mates perfectly with the Nikon F3 to provide automatic *throughthe-lens* control.

The SB-11 utilizes a silicon-controlled rectifier and series circuitry. Thus, when the photographer is shooting subjects at close range, the SB-11 will recycle faster and give a greater number of flashes per set of batteries.

But probably the most professionally desirable feature of this flash unit is its tilting flash head. With the flash unit mounted on-camera (via the bracket) or detached, the tilting head of the SB-11 allows the light to be bounced easily off the ceiling or walls for more diffused lighting a technique especially useful when taking portraits or snapshots. Click-stop settings at 30° , 60° , 90° , and approx. 120° allow complete creative control.

To supply the extra power necessary for bounce flash, the SB-11 has a guide number of 36 (ASA/ISO 100 and meters) or 60 (ASA/ISO 25 and feet). Other features include an easy-to-read calculator dial, open-flash button, and built-in ready-light. Angle of coverage is wide enough for a 35mm wideangle lens and with the attachment of the Wide Adapter SW-3, the SB-11 can be used with a 28mm lens.



Specifications

Light output control

Guide number (ASA/ISO 100 and meters) (ASA/ISO 25 and feet) Angle of coverage

Automatic shooting range (ASA/ISO 100)

ASA/ISO film speed range Recycling time Automatic: flash output control with silicon controlled rectifier (thyristor) using Sensor Unit SU-2; Manual: full output

36 (25 with Wide Adapter SW-3); 60 (42 with Wide Adapter SW-3); Horizontal: 56° (67° with SW-3); Vertical: 40° (48° with SW-3) 0.6~9m (2~30ft) at f/4; 0.6~6.4m (2~21ft) at f/5.6; 0.6~4.5m (2~15ft) at f/8 ASA/ISO 25~800 Automatic: variable depending on shooting distance; Manual: approx.

8 sec.

Number of flashes (approx.)

Power source Ready-light

Open-flash button Mounting Dimensions (approx.) Weight (excluding batteries) Automatic: variable depending on shooting distance; Manual: 150 with fresh set of alkaline-manganese batteries Eight 1.5V AA-type penlight batteries Provided; blinks if flash output is at its

maximum indicating that light might be insufficient for correct automatic exposure Provided Bracket-type 276mm(H) x 104mm(W) x 118mm(D) 860g

FLASH UNIT ACCESSORIES



To increase the versatility of the Nikon Speedlight SB-11 and -12 and insure their compatibility with most Nikon

SLR's, there are a variety of sync cords and flash unit couplers available from Nikon.

TTL Sensor Cord SC-12

TTL Sensor Remote Cord SC-14

Flash Unit Coupler AS-4



One meter long, this cord allows the SB-11 to be used with the Nikon F3 for automatic through-the-lens control of the flash exposure. One end plugs into the flash unit's sensor socket, while the other end slips over the camera's accessory shoe. A switch on the cord provides a choice of automatic or manual operation. When the cord is attached, the shutter speed is automatically switched to the proper flash synchronization speed of 1/80 sec. with the shutter speed dial at A or 1/125 sec. and above. The ready-light inside the camera's viewfinder also operates in the normal manner.

Sensor Remote Cord SC-13



Also one meter long, the SC-13 allows mounting of the SB-11's Sensor Unit SU-2 directly on the F3's accessory shoe (via the Flash Unit Coupler AS-4). In this way, convenient offcamera operation with the flash unit pointed in any direction is possible. With this cord, control of the flash exposure is automatic, but not through-the-lens.



The TTL Sensor Remote Cord SC-14 enables the Speedlight SB-12 to be used with the Nikon F3 up to one meter off the camera. Through-thelens automatic flash output control of the exposure is still provided. Just as when the flash is mounted on-camera, both ready-lights-the one on the back of the flash unit and the other inside the F3's viewfinder-operate in the normal manner: they light up when the SB-12 is recycled and ready to fire or blink to indicate underexposure, incorrect mounting, or unusable filmspeed settings. In addition, with the camera's shutter speed dial set at A, or manually set to 1/125 sec. or above, the proper synchronization speed of 1/80 sec. will be set as soon as the shutter button is depressed. Sturdy brass rails on the accessory shoe and mounting foot insure positive connection. Moreover, the accessory-shoe end of the SC-14 features a tripod socket for mounting the SB-12 on a tripod or light stand.

Flash Unit Coupler AS-3



The Flash Unit Coupler AS-3 converts the Nikon F3's accessory shoe into the Nikon F2's type, allowing direct coupling of the Nikon Speedlight SB-7 or the Repeating Flash Unit SB-6 to the F3.



This coupler converts the F3's accessory shoe into a standard ISO-type hot shoe. By using the AS-4, the Nikon Speedlight SB-10 or SB-E can be attached directly to the Nikon F3. In addition, the camera's LED ready-light inside the viewfinder lights up to indicate flash readiness with either of these Nikon flash units.

Flash Unit Coupler AS-5



The AS-5 allows direct connection of the Nikon Speedlight SB-12 to the Nikon F2's accessory shoe. When the Speedlight SB-12 is used with a Nikon camera other than the F3, only manual flash operation is possible.

Flash Unit Coupler AS-6



Rounding out the line of electronic flash accessories is the Flash Unit Coupler AS-6. With this coupler, the Nikon Speedlight SB-12 can be mounted on any Nikon camera having a standard ISO-type accessory hot shoe, including the Nikon FE, FM, and EM. As with the AS-5, the SB-12 can only be used in the manual mode.



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