

# NIKONOS II

## INSTRUCTION MANUAL

## FOREWARD

A good rinse after one assignment and it's ready for the next.

The Nikonos II amphibious camera is built to go with you wherever your imagination leads you. Underwater, it performs at depths down to 160 feet (50m) without a bulky accessory housing. On land, it takes rain, snow, dust, dirt and salt water in stride. If you can take it, so can the Nikonos. Despite its rugged construction, the Nikonos II is as sleek and compact as other 35mm cameras. Precision engineering and superior Nikkor optics deliver perfect images in places where other cameras wouldn't dare to venture. And when

you've finished your shooting session, just rinse the Nikonos in tap water and it's ready for the next assignment. To get the best results from your camera, read these instructions carefully and practice using the controls before you load any film in the camera. Keep this booklet handy for ready reference until you have mastered its basics. The few minutes you spend familiarizing yourself with the camera will increase your picture-taking pleasure as you explore a whole new world of photography.

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## CAMERA DESIGN

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The Nikonos II consists of three components which fit together snugly to make this a self-contained, watertight camera without any need for a separate bulky underwater housing.

**Outer housing:** Die-cast from thick aluminum alloy and finished in a knurled surface that's easy to grip, even with wet hands or gloves.

**Interior body:** Contains the shutter, film advance lever and other moving parts. Removable for film loading.

**Lens:** When mounted in place, the lens locks the entire camera assembly together, safe from accidentally jarring loose.

**Note:** The Nikonos is watertight only when completely assembled. The components are susceptible to damage individually. If the interior body or lens is accidentally dropped into salt water or muddy water, rinse it immediately in fresh water and take it to an authorized serviceman as soon as possible.

**Note:** Replacement of all gaskets except the ones on the lens and around the top edge of the interior body should be left to an authorized serviceman. Send the camera to an authorized dealer or distributor, or directly to the manufacturer.

### O-Ring Gasket

All joints of the Nikonos are sealed by means of O-ring gaskets. These synthetic rubber rings insure absolute watertightness and can withstand water pressure at depths down to 160 feet (50m)—as deep as you can dive with Scuba equipment. As pressure increases, the seal becomes even tighter.

Occasional lubrication improves the life of the gaskets and makes attaching and removing the lens easier. Make it a practice to lubricate the camera before each underwater picture-taking expedition using the lubricant supplied with the camera for this purpose.

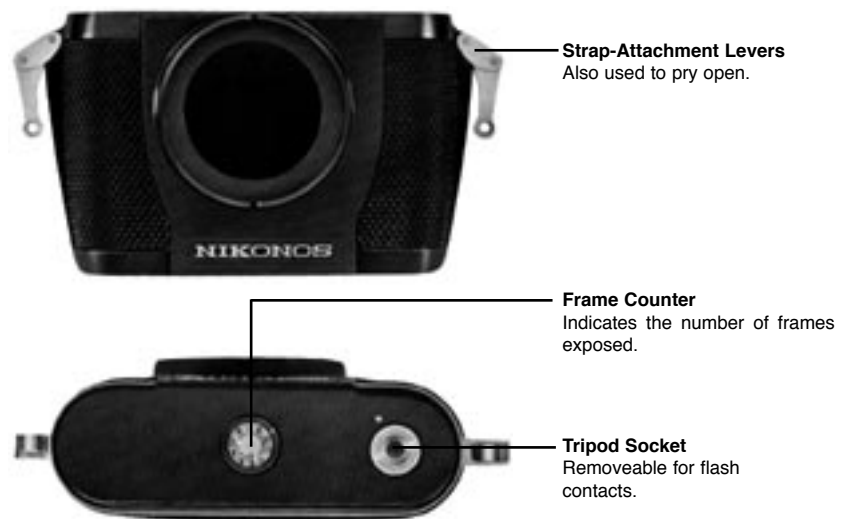
The gaskets should be protected from cuts or scratches caused by sharp objects or grains of sand. Whenever they appear the least bit worn, they should be replaced. Spare gaskets for the base of the lens and around the top edge of the interior body are furnished with the Nikonos.



## CAMERA DESIGN

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### Outer housing



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**Interior body****Rewind Crank and  
Rewind Knob****Accessory Shoe**  
Accepts sports-type  
viewfinder or flash  
unit (on land only)**Viewfinder**

For use with the 35mm  
lens on land. Parallax  
indicators for close-up  
shooting.

**Rewind Shank****Film-Pressure Plate**  
Hinged at the top.**Film Cartridge Catch****Safety Lock**

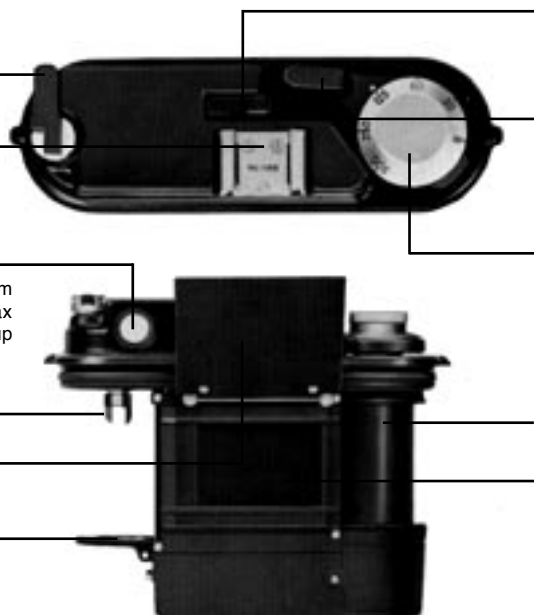
Locks the film advance lever to  
guard againsts accidental  
exposure.

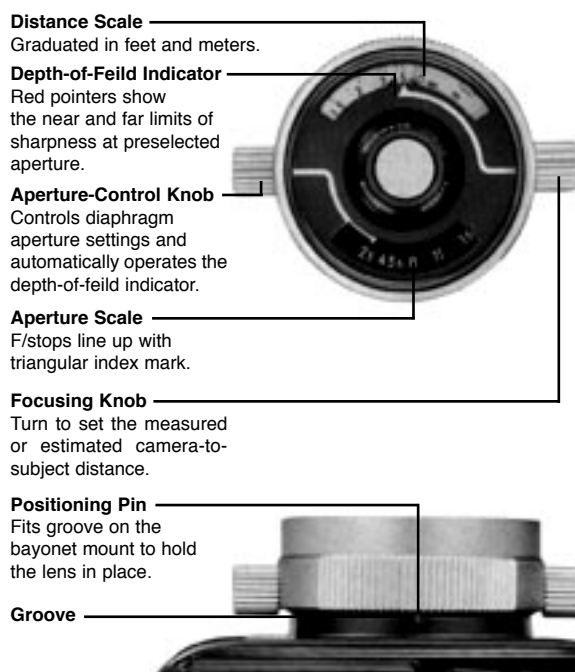
**Safety Lock**

Locks the film advance lever to  
guard againsts accidental  
exposure.

**Shutter-Speed Dial**

Click-stopped settings from 1/30  
to 1/500 second plus "B". "R" is  
rewind setting.

**Spool****Shutter Curtain**



### Lens

The Nikonos 11 comes fitted with a W-Nikkor 35mm f/2.5 lens as standard equipment. The lens is sealed behind a watertight glass plate that also covers the aperture and distance scales. Large, easy-to-grip knobs on either side of the lens mount control focus and diaphragm settings. The front lens mount is threaded to accept lens hoods, close-up lens attachment and 52mm screw-in filters.

A UW-Nikkor 15mm f/2.8 28mm f/3.5 (both for underwater use only) and Nikkor 80mm f/4 are also available (see p. 29, 30). Lenses for the Nikonos 11 are designed so that their lens mounts move independently of the inner mechanisms. This helps to absorb the effect of water pressure when the lenses are used underwater.

## LOADING THE CAMERA

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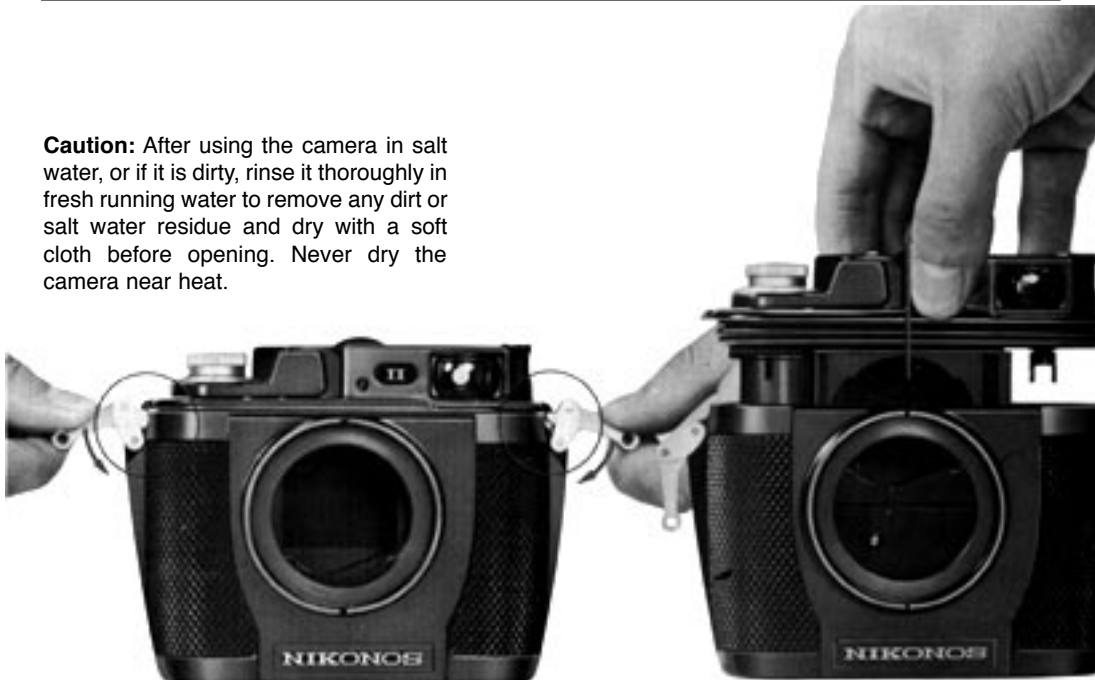
### Opening the Camera

The lens in its bayonet mount locks the entire camera together, so it must be removed first in order to open the camera. Grasp the lens mount and pull the lens forward slightly until the positioning pins on the lens mount slide out of the grooves on the bayonet mount. Then rotate the lens in either direction until the focusing knob or aperture knob points straight up. Pull once more and the lens will slip free of the bayonet mount. Now you can open the camera by prying up the interior body with the strap-attachment levers on both sides of the outer housing. The interior body will come loose and can be lifted out.





**Caution:** After using the camera in salt water, or if it is dirty, rinse it thoroughly in fresh running water to remove any dirt or salt water residue and dry with a soft cloth before opening. Never dry the camera near heat.



## LOADING THE CAMERA

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### Loading

Lift up the film pressure plate. Position a film cartridge between the film cartridge catch and the shank of the rewind knob. Turn the film take-up spool to the right so the slot faces out. Slip the end of the film leader under the hinged pressure plate and insert it into the slot. Advance the film one frame, making sure that the tooth in the slot catches one of the perforations along the edge of the film.



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### Closing the Camera

The procedure for closing the Nikonos is just the reverse of that for opening the camera. Hold down the film pressure plate and slide the interior body into the outer housing. Press down firmly until the top edge of the interior body fits tightly against the top edge of the outer housing.

**Caution:** Be careful not to exert excessive pressure on the shutter-speed dial when inserting the interior body into the housing.

Place the lens in the bayonet mount with the focusing knob pointing towards the top. Push the lens inward and twist it clockwise until the distance scale comes to the top and the positioning pins click into the grooves.

**Note:** The lens can also be mounted upside down for greater convenience in reading the distance scale when the camera is carried on a neck strap. If the lens cannot be mounted smoothly lubricate the O-ring gasket around the lens base.



## LOADING THE CAMERA

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Set the shutter-speed dial for any speed except "R". Fold out the rewind crank and pull up the rewind knob as far as it will go. Continue to pull up on the rewind crank while turning it back and forth until the rewind knob locks in place and cannot be pushed down. This meshes the rewind knob with its shank. Now turn the rewind crank gently in the direction of the arrow until you feel a slight tension which indicates that there is no slack in the film cartridge. Be careful not to exert too much pressure on the crank.



Loading exposes a portion of film. To dispose of this exposed portion, take two blank exposures. Squeeze the film advance lever slightly so that it springs forward then push down the safety lock and squeeze the film advance lever twice (see also p.14) to dispose of the exposed portion of the film. While advancing the film check to see that the rewind crank turns in the direction opposite the arrow. This will indicate that the film has been loaded correctly and is being advanced.

Turn the rewind knob in the direction opposite the arrow and it will drop back to its recessed position. When not in use, the rewind crank should be folded flat with its end pointing towards the front of the camera.

**Note:** If the film-advance lever is squeezed while the safety lock is off, the shutter will be released and the frame counter will advance one frame. The frame counter will not rest at 1 when the first exposure is made.



## FILM ADVANCEMENT AND SHUTTER RELEASE

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### **Film-Advance Lever**

This single lever on top of the camera winds the film cocks and releases the shutter and operates the frame counter all in two simple operations. To wind the film squeeze the lever until it stops with a click. This also cocks the shutter and operates the frame counter. When you are ready to shoot, squeeze the lever again and it releases the shutter and operates the frame counter. After each exposure the lever swings out automatically, ready to be wound for the next frame.



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**Frame Counter**

The frame counter located on the bottom of the camera shows how many frames have been exposed. A black dot advances half a mark for each frame up to 36 exposures. The counter stops just past the 36 mark and resets itself to zero when the camera is opened.

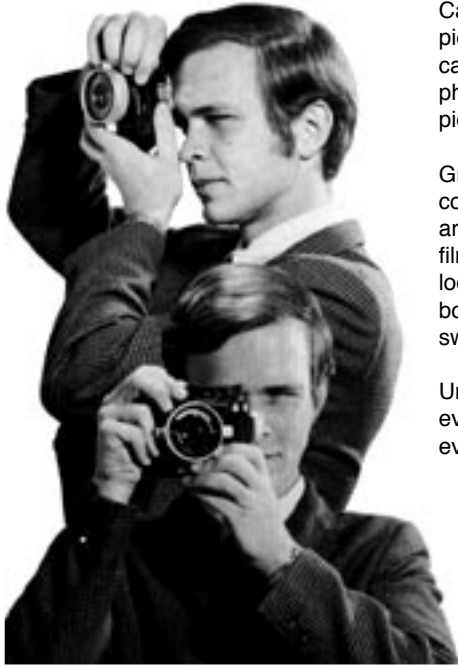
**Safety Lock**

Between pictures, push down the safety lock on top of the camera to guard against accidental exposures. The safety lock should also be pressed down whenever the camera is stored in the leather case to prevent the filmadvance lever from swinging out.



## HOW TO HOLD THE CAMERA

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Camera shake is one of the commonest causes of unsharp pictures, especially at slow shutter speeds. Learn to hold the camera correctly and practice steady shutter squeezing. The photos show the best way to hold the Nikons for sharp picture-taking.

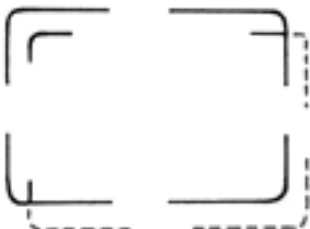
Grasp the camera firmly so that the end of the baseplate rests comfortably in the palm of the left hand. Wrap your right hand around the camera with the right index finger resting on the film advance lever. Position the camera solidly so the eye looks through the center of the viewfinder and steady it with both hands held against the head. The camera may be switched from a horizontal to vertical format in this position.

Underwater, weightlessness makes steady camera holding even more difficult than on land. Concentrate on steadiness even at fast shutter speeds.



## VIEWFINDER

Picture seen in viewfinder



Picture to appear on film



The Nikonos 11 has a built-in bright-line viewfinder on top of the camera for use on land. The viewfinder image corresponds to the picture area of the 35mm lens. At a camera-to-subject distance as close as 2.75 feet (0.8m), however, a slight parallax is evident. In this case, compose with the aid of the parallax indicator lines in the viewfinder to see what the final picture will include.

**Note:** An accessory viewfinder for use with the 80mm lens on land is available separately.

### Underwater Viewfinder

A sports-type viewfinder slides into the accessory shoe on top of the camera for underwater photography. Individual viewfinders are available for each of the interchangeable lenses. They indicate the edges of the picture area and have crossbars to show the center of the frame. Underwater viewfinders are also useful on land for following fast-moving action. For details refer to the instructions supplied with the underwater viewfinders.

## FOCUSING

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Since the Nikonos II has no optical rangefinder, camera-to-subject distances are normally estimated. The depth-of-field indicator on the distance scale shows just how much error you can tolerate and still get sharp pictures. Since the 35mm lens has considerable depth of field, a reasonable estimate will usually result in sharp pictures. Remember too that as the camera-to-subject distance increases (and becomes harder to estimate), the depth of field also increases, thus lowering the chance of error. (See also "Depth of Field," p. 22).



Turn the focusing knob on the right side of the lens mount until the estimated distance appears opposite the white triangular index mark. As long as the subject remains within the limits of sharpness shown by the red pointers on the distance scale, it is in sharp focus. Depth of field decreases sharply at distances closer than 5 feet (1.5m), so it is good practice to stop down the lens to the smallest possible aperture or else measure the actual distance when shooting close-ups. The closest distance at which the 35mm lens can be focused is 2.75 feet (0.8m).

## EXPOSURE CONTROL

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The amount of exposure the film receives is determined by a combination of shutter speed and aperture. The larger the lens aperture, the more exposure. Likewise, the slower the shutter speed the greater the exposure. Aperture is expressed in f/numbers with larger numbers representing smaller apertures and vice versa. For example, f/8 gives twice as much exposure as f/11.

Camera aperture and shutter-speed controls are calculated so that an increase of one f/number compensates for a onestep decrease in shutter speed. For example, 1/250 second at f/4 is the same as 1/60 second at f/8. The table below shows how aperture and shutter speed are interrelated. All the combinations give the same exposure.

Aperture	f/2.8	f/4	f/5.6	f/8	f/11
Shutter Speed (Second)	1/500	1/250	1/125	1/60	1/30

The choice of aperture and shutter-speed combination depends on the desired results. Use a fast shutter speed to freeze movement or a slow one to create deliberate blur. Small apertures give greater depth of field, large ones make the main subject stand out in sharp focus and throw unimportant background out of focus.

## EXPOSURE CONTROL

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### Setting the Shutter Speed

The figures on the shutter-speed dial stand for fractions of a second. For example, 125 represents  $1/125$  second. Turn the shutter speed dial until the desired speed appears opposite the white indicator dot on the film advance lever. You can change shutter speeds either before or after the shutter is wound.



Click-stopped settings for speeds from  $1/30$  to  $1/500$  second plus "B" are engraved on the dial. At the "B" setting the shutter will remain open as long as the film advance lever is squeezed all the way back. The number "60" is colored red as a reminder that  $1/60$  second is the highest speed at which electronic flash will synchronize. The "R" setting is used when rewinding the film. Intermediate settings between the marked shutter speeds are not recommended.

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**Setting the Aperture**

The aperture-control knob on the left side of the lens mount controls diaphragm settings and operates the depth-of-field indicator on the distance scale. Turn the knob until the desired f/number appears opposite the white triangular index mark. A white arrow leading from the aperture knob to the aperture scale makes identification of the knob easy.



## EXPOSURE CONTROL

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### Depth of Field

Depth of field refers to a zone extending in front of and behind the plane of sharpest focus. It extends a greater distance behind the subject in focus than in front. Within this zone, blur (or unsharpness of the image) is negligible and everything can be accepted as being in sharp focus. Depth of field depends on three factors: focal length of the lens, lens-to-subject distance and taking aperture. The smaller the aperture and the shorter the focal length of the lens, the greater the depth of field (for example, wideangle lenses have more depth of field than telephotos). Also, the closer the subject, the smaller the depth of field. These three factors can operate independently or in conjunction with one another and one factor may act to partially cancel the effect of the others.

1. Lens at f/11 aperture Small depth of field with only main subject in focus.
2. Lens at f/16 aperture Great depth of field with subject, background and foreground in focus.

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**Depth-of-Field Indicator**

Depth of field can be read directly from the distance scale in either feet or meters with the aid of the depth-of-field indicator coupled to the lens aperture control. As you change aperture settings, two red pointers move over the distance scale automatically to indicate the near and far limits of sharpness at each aperture setting. For example, with the 35mm lens focused at 10 feet (3m) and set at f/16, the pointers show that the depth of field extends from about 5 feet (1.5m) to infinity ( $\infty$ ).



FLASH SYNCHRONIZATION



The Nikonos II is designed to synchronize with almost all types of flashbulbs at all shutter speeds and with electronic flash at speeds up to 1/60 second. The synchro socket on the camera baseplate has an FP contact for use with type M, FP and MF flashbulbs and an X contact for electronic flash. The table below shows which shutter speeds may be used with different types of flashbulbs.

Contact	Flashbulb	Shutter Speed					
		500	250	125	60	30	B
FP	M						
	FP						
	MF						
X	Electronic Flash						

 : Synchronized     : Cannot be used

An accessory flash unit adapter makes possible the use of a regular flash unit or electronic flash on land. Slide the flash unit into the accessory shoe on top of the camera. Unscrew the tripod socket and screw in the flash unit adapter in its place. Connect the synchro cord to the flash contact on the adapter.

For underwater photography, an underwater flash unit is available. Refer to the instruction manual supplied with the unit for details.

**Caution:** Do not submerge the camera in water with the tripod socket unscrewed unless the underwater flash connector is securely fastened



## UPLOADING

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Set the shutter-speed dial at “R” (rewind), and pull the rewind knob up all the way. Unfold the rewind crank and turn it in the direction of the arrow with a gentle, even pressure. Avoid uneven or excessively fast rewinding. When no more tension is felt, the film has left the takeup spool and the camera may be opened.

**Note:** If the rewind crank will not turn, squeeze the film advance lever slightly.

**Caution:** Never unload the camera underwater.

## TIPS FOR UNDERWATER PICTURE-TAKING

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Successful underwater photography depends on several factors which have no effect on land—clarity of the water, angle of the sun, etc. But with a little practice and experimentation you can learn to get good results consistently. The following are some hints designed to help beginners improve their underwater pictures.

### Visibility

Underwater visibility—the distance from a diver at which underwater objects are no longer discernible—varies depending on several factors, mainly particles suspended in the water. Visibility decreases as camera-to-subject distance increases, so move in as close to your subjects as possible. Shooting at closer distances will also make colors more lifelike and improve sharpness and contrast.

### Focusing

Optical distances in air do not correspond to true distances in water since the refractive index of water differs from that of air. This has the effect of increasing the focal length of the lens and narrowing the picture angle underwater by a ratio of 4 to 3. For practical purposes, this makes no difference since both the photographer and his lens are influenced by refraction and will “see” alike underwater. However, when distances are actually

measured, the distance scale should be set at  $\frac{3}{4}$  the measured distance to compensate. For example, to focus the lens on an object 10 feet (3m) away, set the distance scale to  $10 \times \frac{3}{4}$  or 7.5 feet (2.2m).

**Exposure**

For accurate exposures underwater, an exposure meter in a watertight case is recommended. If a meter is unavailable, however, the following procedure will generally give satisfactory results: first measure the light above water. Use this exposure setting for depths up to three feet (1m) and open up the lens one full stop for each additional three feet.

Whenever possible, avoid pointing the camera straight down. Since the light source is behind the camera, illumination is flat and contrast is poor. For best picture quality, try to shoot horizontally.

As depth increases, light falls off rapidly. Therefore flash may be necessary at depths of 20 feet (6m) or more, especially with color films. To compensate for light loss underwater, daylight guide numbers for flash units must be adjusted according to experience. Some experimentation will usually yield the correct adjustment for a particular unit.



## TIPS FOR UNDERWATER PICTURE-TAKING

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When the flash reflector is positioned at or near the camera, particles suspended in the water will be illuminated sharply and will appear in the final print or transparency as white, out-of-focus blotches. Hold the flash unit away from the camera, as close to the subject as possible.

### Film

Generally, the choice of what film to use for underwater photography will be guided by the same considerations as in ordinary photography. When underwater visibility is poor, however, faster films are a must.

### Filters

Red is absorbed rapidly underwater, resulting in pictures with an overall greenish or bluish cast. To avoid this effect with color film, use an amber filter such as A2 or A12. With black-and-white film, try sharp-cut series filters like Y44, Y48, Y52 or 056. These filters improve contrast by cutting underwater haze and absorbing colors that spoil the effect of black-and-white photos.

## INTERCHANGEABLE LENSES

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### **UW-Nikkor 28mm f/3.5**

Designed exclusively for underwater use, this wideangle lens is corrected for maximum sharpness underwater. The distance scale is marked in optical distances in water instead of true distances. Picture angle underwater is a wide 59 degrees, and excellent depth of field makes focusing easy. Supplied with a plastic lens protector. Underwater viewfinder for exclusive use with lens is also available separately.

Picture Angle: 59° (underwater)

Construction: 6 elements in 5 groups

Minimum Aperture: f/22

Distance Scale: Graduated in feet and meters down to 2 ft (0.6m).



### **Nikkor 80mm f/4**

The Nikkor 80mm f/4 has a picture angle of 22 degrees underwater (30°22' on land) and adds a telephoto capability to the Nikonos II. Individual viewfinders are available for use underwater and on land.

Picture Angle: 22° (underwater) 30°22' (on land)

Construction: 4 elements in 4 groups

Minimum Aperture: f/ 22

Distance Scale: Graduated in feet and meters down to 3 ft (1m).

## INTERCHANGEABLE LENS / ACCESSORIES

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### **UW-Nikkor 15mm f/2.8**

The UW-Nikkor 15mm f/2.8 is designed as a super wideangle lens to be used exclusively underwater, and it performs at depths down to 160ft (50m).

The image aberrations being corrected exclusively for underwater use, the lens provides excellent underwater photographs. By using the viewfinder available as accessory, an exact sighting will be obtained.

Picture Angle: 94°

Construction: 9 elements in 5 groups

Minimum Aperture: f/22

Distance Scale: Graduated in feet and meters down to 1ft (0.3m).

**Underwater Flash Unit:** Specifically designed for underwater use with the Nikonos camera, the Flash Unit permits the use of an FP-Class bulb with Single Contact Bayonet base. The Unit can also be used apart from the camera.

**AG-Bulb Adapter:** Allows AG-type flashbulbs to be used with the underwater flash unit.

**O-Ring Lubricant:** The camera's O-ring~gaskets should be lubricated frequently. A tube of lubricant is supplied with the camera, together with an extra set of gaskets.

**Lens Hoods:** The use of a lens hood is recommended at all times to prevent extraneous light from striking the lens surface and as an added measure of protection. Screw-in lens hoods are available for the 35mm and 80mm lenses. A rubber hood is also available for the 35mm lens. The lens hoods fit directly over the 52mm screw-in filters so both units can be used on a lens at the same time. Front **Lens Cap:** Fits the 28mm, 35mm and 80mm lenses.

**Rear Lens Cap:** The water-tight rear cap should be attached whenever the lens is stored separately. Fits the 28mm, 35mm and 80mm lenses

**Semisoft Leather Case:** Water-repellent, treated to resist mildew and fungus and fitted with a corrosion-proof zipper, the camera case accommodates the Nikonos with either the 35mm or 28mm lens attached.

**Close-Up Outfit:** Consists of a close-up attachment lens, three field frames for the 28mm, 35mm and 80mm lenses, and a bracket. Can be used as a focusing guide with the 35mm and 80mm lenses on land. Underwater, the area defined by the frame will be in sharp focus at a distance of 235mm (9.3 in )

Refer to the instruction manual supplied with the closeup outfit for details.



## NIKONOS II FEATURES / SPECIFICATIONS

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<b>Camera type</b>	35mm amphibious camera. Negative size 24 x 36mm (about 1"x 1-1/2"). Accepts standard 20- or 36-exposure cartridges.
<b>Lens</b>	W-Nikkor 35mm f/2.5 supplied as standard lens. 6-element 4-group configuration. Picture angle 62° (46.5° underwater). Focusing from 2.75 feet (0.8m) in air to infinity.
<b>Aperture scale</b>	Click-stopped settings for f/2.5, 4, 5.6, 8, 11, 16 and 22. Aperture is set by knob on side of lens, read on lens front. Read directly on distance scale by means of two red pointers coupled to the lens aperture control.
<b>Shutter</b>	Focal-plane type with vertical movement. Click-stopped speeds from 1/30 to 1/500 second plus "B" engraved on shutter speed dial. Shutter cocking and releasing by two strokes of film advance lever.
<b>Focusing</b>	Zone focusing with large, easy-to-read depth-of-field indicator on lens front.
<b>Viewfinder</b>	Albada-type viewfinder for use on land has bright frame corresponding to 35mm lens coverage, parallax correction corner marks for close-up composition. Accessory sportsfinders available for underwater use.



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<b>Film advance</b>	73° stroke of film-advance lever advances the film and cocks the shutter and operates the frame counter.
<b>Film rewind</b>	Lift-up type rewind crank. "R" setting on shutter speed dial is rewind position.
<b>Film -pressure plate</b>	Hinged to facilitate film loading.
<b>Flash synchronization</b>	Synchronizes with almost all types of flashbulbs at all speeds and with electronic flash at speeds up to 1/60 second. Watertight socket houses FP and X contacts.
<b>Frame counter</b>	Indicates number of frames exposed up to 36, resets itself automatically when camera is opened for reloading.
<b>Camera Body</b>	Impregnated aluminum alloy die casting. Three-piece construction (outer housing, interior body, lens) sealed against water and pressure by O-ring gaskets.
<b>Accessory shoe</b>	Accepts sportsfinders and other accessories.
<b>Tripod socket</b>	Located on camera bottom. Has synch socket inside and can be replaced with gun connector for use with ordinary flash or speedlight units on land.
<b>Dimensions (body only)</b>	3.9" x 5.1" x 1.9" (99mm x 129mm x 47mm)
<b>Weight (body only)</b>	20 oz (540 gr)